DOE/EIA-0321(93)

Household Energy Consumption and Expenditures 1993

October 1995

This publication and other Energy Information Administration (EIA) publications may be purchased from the Superintendent of Documents, U.S. Government Printing Office.

All telephone orders should be directed to:

U.S. Government Printing Office
McPherson Square Bookstore
1510 H Street, N.W.
Washington, DC 20005
(202) 653-2050
FAX (202) 376-5055
9 a.m. to 4:30 p.m., eastern time, M-F

Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402
(202) 783-3238
FAX (202) 512-2233
8 a.m. to 5 p.m., eastern time, M-F

All mail orders should be directed to:

U.S. Government Printing Office
P.O. Box 371954
Pittsburgh, PA 15250-7954

Complimentary subscriptions and single issues are available to certain groups of subscribers, such as public and academic libraries, Federal, State, local and foreign governments, EIA survey respondents, and the media. For further information and for answers to questions on energy statistics, please contact EIA's National Energy Information Center. Address, telephone numbers, and hours of operation are as follows:

National Energy Information Center, EI-231
Energy Information Administration
Forrestal Building, Room 1F-048
Washington, DC 20585
(202) 586-8800
Telecommunications Device for the Hearing Impaired Only: (202) 586-1181
Option: TDD, 9 a.m. to 5 p.m., eastern time, M-F
Internet: INFOCTR@EIA.DOE.GOV or Home Page http://www.eia.doe.gov

Released for Printing:

Contacts

This publication was prepared by the Energy Information Administration (EIA) under the general direction of W. Calvin Kilgore, Director of the Office of Energy Markets and End Use (202-586-1617). The project was directed by Lynda T. Carlson, Director of the Office of Energy End Use and Integrated Statistics Division (EEUISD) (202-586-1112) and Nancy L. Leach, Chief of the Residential and Commercial Branch (202-586-1114). Specific technical information may be obtained from the Residential Energy Consumption Survey (RECS) Manager, Wendel Thompson (202-586-1119). The FAX number for all EEUISD personnel is 202-586-0018.

Detailed technical questions on the topics indicated may be referred to the following members of the EEUISD:

Joelle Davis	Appendix D	202-586-8952 jdavis@eia.doe.gov
Robert Latta	End-Use Estimates, Sampling Design, Sampling Variances	202-586-1385 rlatta@eia.doe.gov
Michael Laurence	Expenditures Adjustments, Demand-Side Management, Detailed Statistical Tables, Glossary	202-586-2453 mlaurenc@eia.doe.gov
Vicki Moorhead	Table Production	202-586-1133 vmoorhea@eia.doe.gov
Linda Owens	Weather Adjustments, Main Space-Heating Fuel, All-Electric Homes	202-586-5891 lowens@eia.doe.gov
Hattie Ramseur	Related Statistical Publications, Figures	202-586-1124 hramseur@eia.doe.gov
Nanno Smith	Public-Use Data, Computer Systems Design	202-586-5841 nsmith@eia.doe.gov
Wendel Thompson	RECS Manager, Consumption, New Homes	202-586-1119 wthompso@eia.doe.gov

Support was received from the U.S. Department of Health and Human Services, Administration for Children and Families (ACF) and the Office of Minority Economic Impact in the U.S. Department of Energy for special components of the survey. See Appendix A for a description of the information collected for the ACF.

Public-Use Data Diskettes containing RECS data are available through the Office of Scientific and Technical Information and the National Technical Information Service. (See Appendix G, "Related EIA Publications on Energy Consumption," for ordering information.) Selected tables are also available on the Electronic Publishing System (EPUB). For questions about the contents of EPUB reports and data and availability of this information on CD-ROM, call 202-586-8800. Information is also available by accessing EIA's Home Page on the Internet at http://www.eia.doe.gov.

Contents

Tables

Illustrations

Executive Summary

Household Energy Consumption and Expenditures 1993 presents information about household end-use consumption of energy and expenditures for that energy. These data were collected in the 1993 Residential Energy Consumption Survey (RECS), the ninth in a series of nationwide household energy consumption surveys conducted since 1978 by the Energy Information Administration of the U.S. Department of Energy. More than 7 thousand households were surveyed for information on their housing units, energy consumption and expenditures, stock of energy-consuming appliances, and energy-related behavior. The information represents all households nationwide—97 million. An earlier report presented information on the energy-related characteristics of U.S. households.

Key Findings

- National residential energy consumption was 10.0 quadrillion Btu in 1993, a 9-percent increase from the 9.2 quadrillion Btu consumed in the last study in 1990. Average household consumption of major energy sources—electricity, natural gas, fuel oil, kerosene, and liquefied petroleum gas (LPG)—was 103.6 million Btu in 1993, compared with 98.1 million Btu in 1990 (an increase of 6 percent). These changes are statistically significant.

- Between 1990 and 1993, national expenditures for household energy increased by 12 percent—from 110 billion dollars to 124 billion dollars. The average household spent $1,282 for all major energy sources.

- Natural gas remains the predominant fuel for space heating. U.S. households consumed nearly three times as much natural gas as site electricity (89.9 million Btu versus 34.0 million Btu per household) but they paid 54 percent more for electricity ($840 per household per year for electricity versus $546 for natural gas). More than 60 percent of new homes use natural gas for main space heating.

- New homes (built between 1988 and 1993) use energy at a rate that is 82 percent of the rate used by homes built before 1980. Most of this gain comes from improvements in space heating. New houses have the newest heating equipment—powered by either electricity or natural gas—and their shells tend to be more airtight. The 1993 RECS over sampled new homes to learn more about their energy efficiency.

- Weather has a significant effect on energy consumption. Energy consumption in 1993 would have been nearly unchanged from consumption in the 1987 and 1990 survey years if the winter had been as warm. The colder winter in 1993 led to an increase of 9 percent in natural gas consumption for space-heating and a 21-percent increase in electricity consumption for space-heating from 1990. Summers over the 3 survey years were about equally warm and close to the 30-year average, so weather had little effect on energy consumption for air-conditioning.

- Energy expenditures per household in 1993 were $159 greater than in 1987, an increase of 14 percent. After expenditures are adjusted for variations in weather and price changes, the difference is reduced to $92, or an 8.6 percent increase.

.

- More than half the electricity used in the home goes for appliances—lighting, TV, clothes dryers, freezers, ranges and ovens, and others. For the first time, the 1993 RECS provided separate estimates for the annual amount of electricity used for lighting (940 kilowatthours (kWh)), cooking (458 kWh), clothes drying (875 kWh), and dishwashing (299 kWh) per household.

- The consumption of electricity for appliances is increasing, likely a result of the use of more appliances. For example, in 1980 only 14 percent of households used microwave ovens, but in 1993, 84 percent of households used one. Personal computers are another appliance that has become more common; in 1990, 16 percent of households had personal computers, a percentage that grew to 23 percent in 1993.

- Also for the first time, the 1993 RECS collected State data for the four most populous States: California, Florida, New York, and Texas. California, with 11 percent of U.S. households, consumed 7 percent of total U.S. energy; Florida, with 6 percent of households, consumed 3 percent; New York, with 7 percent of households, consumed 8 percent of U.S. energy; and Texas, also with 7 percent of households, consumed 7 percent of total U.S. energy.

- Households that use electricity for their main space heating fuel have lower overall energy expenditures than households that heat with other fuels, despite the fact that electricity costs more per million Btu. Reasons for this apparent anomaly are that households with electric heat tend to be newer, located in warmer climates or in areas where electricity rates are low, and more likely to be apartments than single-family homes.

1. Introduction

Household Energy Consumption and Expenditures 1993, the second of two reports based on data from the 1993 Residential Energy Consumption Survey (RECS), provides information on the use of energy in residential housing units in the United States, including consumption and expenditure data for natural gas, electricity, fuel oil, liquefied petroleum gas (LPG), and kerosene. The first report, *Housing Characteristics 1993,* published in June 1995, features data on physical characteristics of residential housing units, appliances used, the number and characteristics of occupants, the fuels used, and other energy-related characteristics.

RECS Methodology

EIA Surveys

Congress has mandated that EIA collect, analyze, and disseminate impartial, comprehensive data about energy—how much is produced, who uses it, and the purposes for which it is used. To comply with that Congressional mandate, the EIA conducts two types of surveys:

- **Supply surveys** gather information annually or more frequently from energy suppliers and marketers on the quantities and prices of specific energy sources produced or supplied to the market. The results of the supply surveys are combined and published in fuel-specific EIA publications and in the *Monthly Energy Review.*

- **Consumption surveys** gather information every 3 years directly from energy end users on the types of energy they use, along with information on the energy-related characteristics of households, commercial buildings, vehicles, and manufacturing establishments. The results of these surveys are published in energy-consumption reports, such as this report. Special analytical reports are also available on the EIA Home Page on the World Wide Web; on EIA's CD-ROM; diskettes; and EPUB, EIA's electronic publishing service.

The 1993 RECS is the ninth survey of residential housing units and their energy suppliers conducted by EIA. Previous RECS were conducted annually from 1978 to 1982 and triennially since 1984. The RECS consists of three parts:

- Personal interviews with **households** for information about energy used, how it is used, energy-using appliances, structural features, energy efficiency measures, and demographic characteristics of the household

- Telephone interviews with **rental agents** for households that have any of their energy use included in their rent. This information augments information collected from those households that may not be knowledgeable about the fuels used for space heating or water heating

- Mail questionnaires sent to **energy suppliers** (after obtaining permission from households) to collect the actual billing data on energy consumption and expenditures.

RECS Data Used in this Report

The statistics published in this report are based on a sample of 7,111 households from the population of all primary, occupied residential housing units in the United States as of July 1993. As a result, all of the statistics are estimates rather than exact measurements of the population. The 1993 RECS represents 96.6 million households in the 50 States and the District of Columbia. As discussed in Appendix B, the accuracy of each estimate is indicated by the relative standard error (RSE). No estimates were published that were based on fewer than 10 sampled households or that had an RSE greater than 50 percent. All the tables of the estimates in the section titled "Detailed Tables" include corresponding RSE's that are calculated by using row and column RSE factors.

EIA gratefully acknowledges the cooperation of the respondents for supplying the information used to produce the estimates in this report.

Organization of the Report

Following this introductory chapter, Chapters 2-4 highlight survey findings with special attention given to new data and areas of expanded detail not found in previous reports. Many data referenced in the text are from the "Detailed Tables" section of the report, where extensive cross tabulations of energy sources and end uses are presented. These analyses can be reproduced by using RECS public-use data files. Some tabulations of special interest appear in these chapters.

The detailed tables in Chapter 5 are organized by the following categories: total consumption and expenditures, consumption and expenditures for major energy sources, consumption and expenditures by end uses, and consumption and expenditures by major fuel source for end uses.

These chapters are followed by six technical appendices, which provide the supporting information on the survey. Appendix A provides information on the survey design and how the data were collected and processed. Appendix B discusses procedures for calculating the relative standard error of the data, data imputation procedures, and other quality-related topics. Appendix C provides more background about the nonlinear equations used to estimate end-use consumption. Differences in the coverage of this survey and EIA supply surveys are discussed in Appendix D.

Copies of the forms used to collect RECS data, Forms EIA-457 A through H, can be found in Appendix E. Climate zones and Census regions and divisions maps are located in Appendix F. A list of related EIA publications is located in Appendix G. Appendix H presents a table of metric conversion factors. Definitions of the terms used in this report are located in the Glossary.

A Note on Interpreting the Data

Data in this report are presented in the form of aggregate totals and household averages. For each household that responded to the 1993 RECS, the annual amounts of energy used for five end-use categories—space heating, water heating, air-conditioning, refrigerators, and appliances—were estimated. End-use estimates were produced for each of the five main energy sources: electricity, natural gas, fuel oil, kerosene, and LPG. These estimates were not based on data produced by placing meters on individual appliances within a household; instead, they were obtained by estimating how much of the total annual consumption for each energy source can be attributed to each of the end-use categories for each household by using a regression technique (see Appendix C).

This approach yields a wealth of reliable information about energy consumption and expenditures in the United States, but the data must be interpreted carefully. Energy consumption is affected by variety of factors that make comparisons overtime difficult, such as:

- Changes in weather
- Presence of insulation and other demand-side management efforts
- Age of housing stock
- Geographical shifts in population
- Changes in household size.

Moreover, associations between variables should not be confused with causality. For example, survey data show that households with incomes below the poverty line tend to use less energy than higher-income households. This does not necessarily mean that poverty causes people to use less energy. Factors such as the size of the dwelling, number of family members, and number of energy-consuming appliances all may play a part in explaining levels of energy consumption.

2. Analyzing Trends in the RECS Data

The data produced by the RECS can be used in two ways. One way is to look at the data as a snapshot of the characteristics, consumption, and expenditures of U.S. households during the survey year. For example, one could use the data to find out what the average household spent on electricity in 1993. The other way to use the data is to look at trends (i.e., changes in characteristics, consumption, and expenditures over time). One could analyze the data to determine if new housing units tend to be larger than older units and, therefore, consume more energy; to determine if households are changing the types of fuel they use; or to determine if households are spending more of their income on energy. However, such trends over time are affected by two predictable factors: variations in weather and inflation. This section of the report focuses on the effects of these two factors on energy consumption and expenditures.

Differences in energy consumption due to temperature variations can result in misleading comparisons among households sharing similar characteristics but located in different geographic or climatic regions. Winter temperatures that are lower than normal would result in a household using more energy than normal. Conversely, summer temperatures more moderate than usual would result in a household using less energy than normal. Controlling for the effects of these two factors provides a better idea of how households are behaving and how well the equipment and housing structures are performing.

Annual energy expenditures are a function of energy consumption. Lower or higher energy consumption due to unusual temperature variations will result in decreased or increased expenditures. In addition, comparisons of energy expenditures across survey years can be misleading due to the effects of dollar inflation (the decrease in value of the currency due to price increases) over time. For example, if inflation averages 5 percent per year over a 5-year period, an average annual expenditure in year 1 of $1,200 will be equivalent to $1,531 in year 5.

In order to determine specific trends in energy consumption and expenditures, the effects of variation in weather and inflation from survey year to survey year have to be controlled. Appendix B describes the methodology used to control for these two factors.

The Effects of Weather on Energy Consumption

In 1993, the average household consumed 70.9 million Btu of natural gas and 15.5 million Btu of electricity for space heating. These numbers represent a 9 percent increase in natural gas consumption and a 21 percent increase in electricity consumption for space heating from the 1990 consumption data in the RECS. A quick glance at these estimates might lead one to believe that households are less conscientious about energy consumption than they were in 1990. However, what is really responsible for the increase in consumption is *weather*.

The winters of the 1987 and 1990 survey years were both warmer than average and warmer than the winter of the 1993 survey year (see Appendix B, Table B.6). The summers of all three survey years were also warmer than average. One way to determine if changes in consumption are due to the weather is to adjust them by heating and cooling degree-days.[1] Figure 2.1 shows the electricity consumption for space heating and air conditioning, by survey year, both as reported and adjusted for heating and cooling degree-days. Figure 2.2 shows the natural gas consumption for space heating both as reported and adjusted for heating degree-days.

Although electricity consumption for space heating decreased in 1990 and then increased in 1993, if the weather had been average for all three survey years, there would have been no change in the average consumption per household. The number of cooling degree-days in the three surveys were nearly equivalent, resulting in little change in the electricity consumption for air-conditioning. The cooling degree-days were also only slightly higher than the 30-year average, so the adjustments made little difference.

[1]Heating degree-days measure how cold an area is compared to a base temperature (65 degrees Fahrenheit in the RECS). Cooling degree- days measure how hot an area is. If the average temperature on a given day is 40 degrees Fahrenheit, then there are 25 heating degree-days and no cooling degree-days that day. If the average temperature is 80 degrees Fahrenheit, then there are 15 cooling degree-days and no heating degree-days that day.

Figure 2.1. Electricity Consumption Adjusted for 30-Year Average Heating and Cooling Degree-Days, 1987, 1990, and 1993

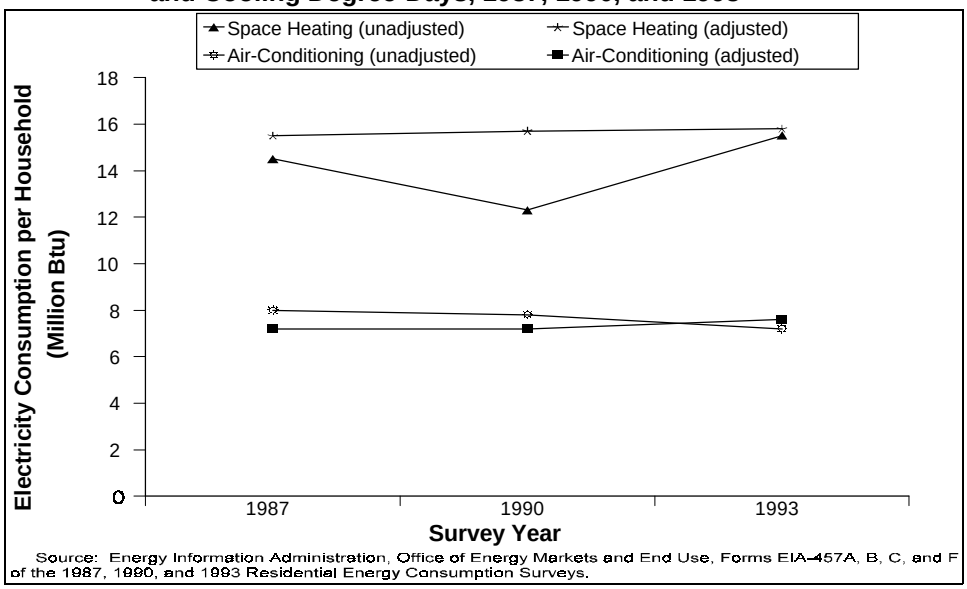
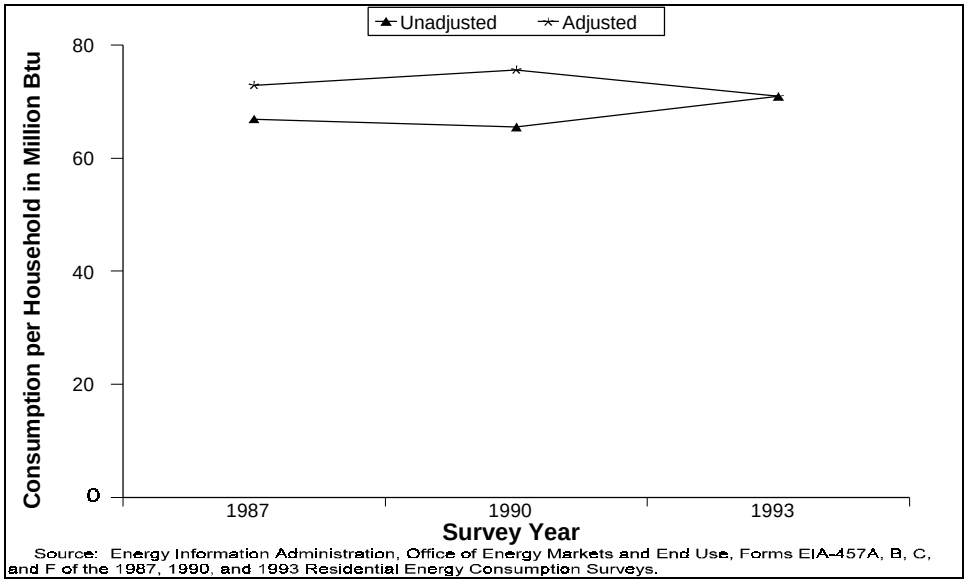


Figure 2.2 shows that unadjusted natural gas consumption for space heating decreased in 1990, then increased again in 1993. However, had the weather been average, the consumption in 1990 would have increased slightly, while the 1993 consumption would have decreased slightly. All of the consumption estimates presented in the RECS reports are based on the weather during the survey year. The above adjustments highlight the importance of considering changes in weather when making comparisons from one year to another.

Figure 2.2. Natural Gas Space-Heating Consumption Adjusted for 30-Year Average Heating Degree-Days, 1987, 1990, and 1993



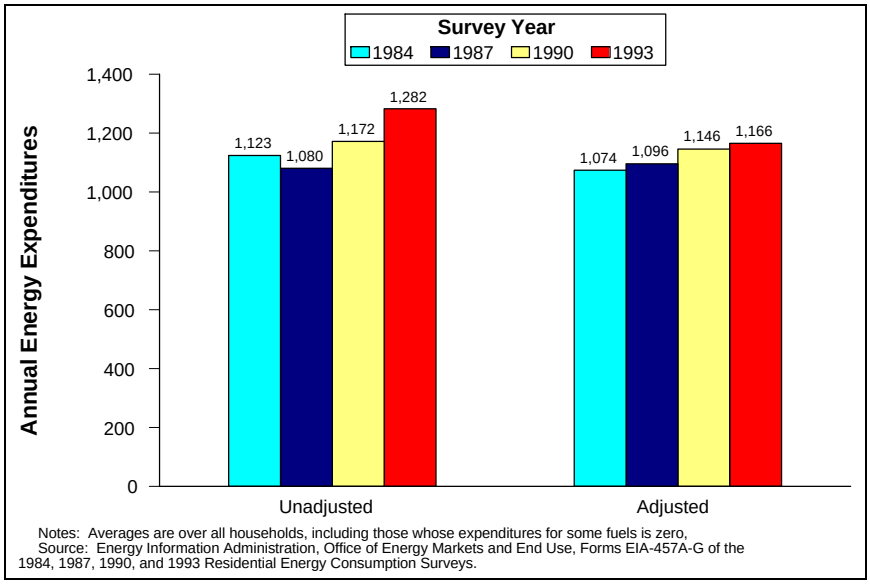
Household Energy Expenditures: Increasing or Decreasing Over Time?

Energy expenditures must be adjusted for weather in the same way as consumption data were in the last section. In order to determine the trends in expenditures over time, the data must be adjusted for variations in the weather and for changes in prices that reflect inflation or deflation. Comparing expenditures during an unusually cold year with those in a warm year without adjustment would result in a misleading trend, and ignoring the effects of changes in prices could result in misleading conclusions.

The left half of Figure 2.3. shows a steep rise in average annual expenditures per household from 1987 to 1993, about $200 over the 6-year period. These figures do not reflect the effects of price changes. Nor do they take into account year-to-year variations in temperatures compared to long-term averages.

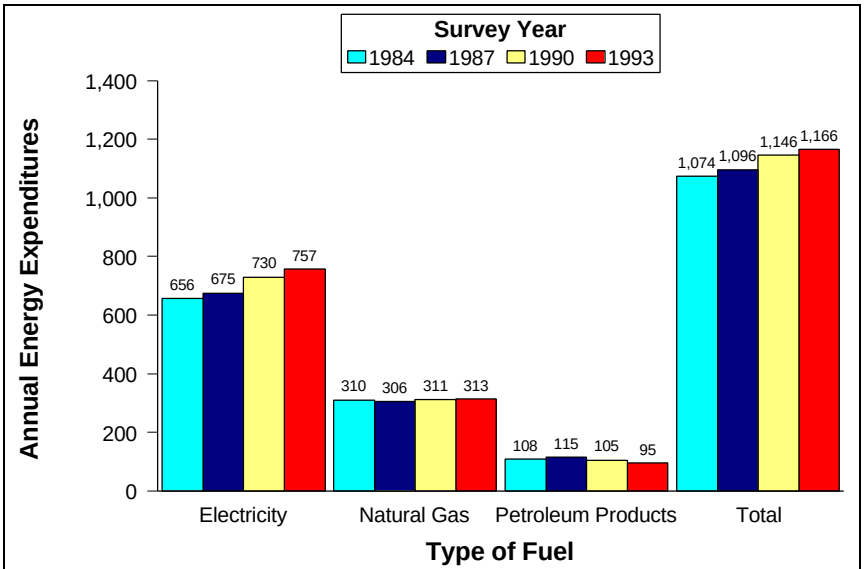
The right half of Figure 2.3 presents these same average annual household energy expenditures adjusted for both inflation and temperature variations. These adjustments reduced the average annual expenditures for 3 of the four survey years. The adjustments also resulted in a more gradual year-to-year trend. Over the 9-year period, unadjusted annual expenditures increased by $159, a 14.2 percent increase, compared to the adjusted increase of 8.6 percent, totaling $92.

Figure 2.3. Average Annual Household Energy Expenditures All Households—Unadjusted and Adjusted for Degree-Days and Price Changes, 1984, 1987, 1990, and 1993



Notes: Averages are over all households, including those whose expenditures for some fuels is zero,
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-G of the 1984, 1987, 1990, and 1993 Residential Energy Consumption Surveys.

Figure 2.4. Average Annual Household Energy Expenditures By Type of Fuel—Adjusted for Degree-Days and Price Changes, 1984, 1987, 1990, and 1993



Notes: Averages are over all households, including those whose expenditures for some fuels is zero. Petroleum products includes fuel oil, kerosene, and LPG.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-G of the 1984, 1987, 1990, and 1993 Residential Energy Consumption Surveys.

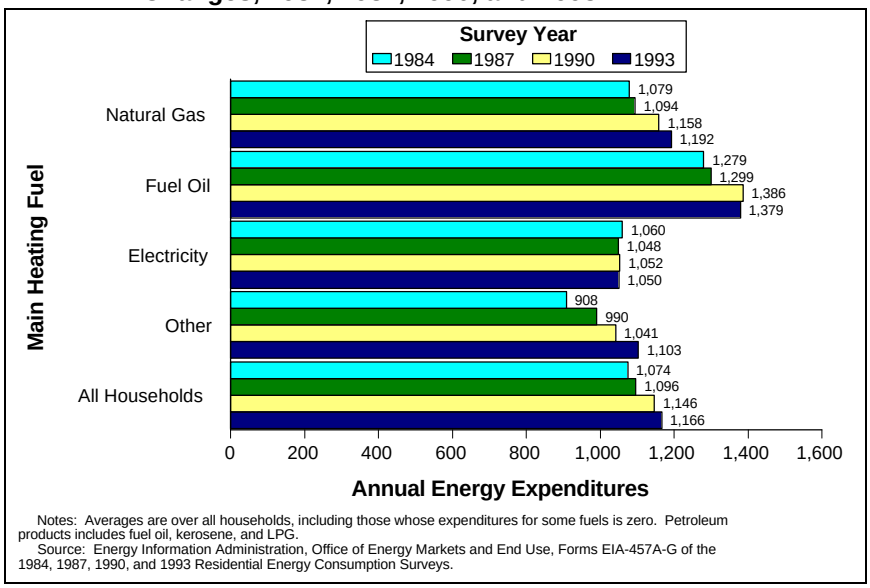
Type of Fuel

Electricity accounted for as much as 65 percent of adjusted average annual household energy expenditures (see Figure 2.4). From 1984 to 1993, expenditures for electricity increased by an average of $101, an amount exceeding the average increase in total expenditures of $92. In contrast, natural gas expenditures, which accounted for as much as 29 percent of total expenditures, remained virtually unchanged, and expenditures for petroleum products (excluding motor fuels), which accounted for 8-10 percent of total expenditures, decreased by $13.

Main Heating Fuel

Despite the fact that electricity increased the most in average costs, households that used electricity as their main heating fuel had, on an adjusted basis, notably lower average annual expenditures than those using natural gas or fuel oil (see Figure 2.5).[2] Moreover, expenditures by households using electricity as their heating fuel were virtually unchanged over the 9-year period, while all other households had year-to-year increases in their total average energy expenditures. Households using fuel oil as their main heating fuel had consistently higher total annual expenditures than those households using natural gas or some other fuel. Households using a heating fuel other than natural gas, fuel oil or electricity, such as LPG or kerosene, had the largest increase in total annual energy expenditures from 1984 to 1993, 21.6 percent.

Figure 2.5. Average Annual Household Energy Expenditures By Main Heating Fuel—Adjusted for Degree-Days and Price Changes, 1984, 1987, 1990, and 1993

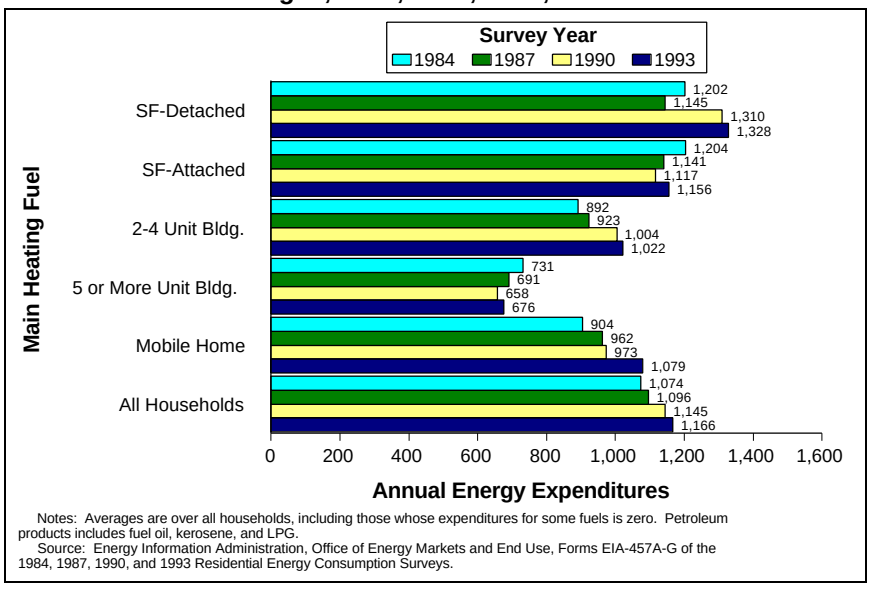


Notes: Averages are over all households, including those whose expenditures for some fuels is zero. Petroleum products includes fuel oil, kerosene, and LPG.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-G of the 1984, 1987, 1990, and 1993 Residential Energy Consumption Surveys.

Type of Housing Unit

Among the various types of housing units, single-family detached homes, apartments in buildings with 2-4 units, and mobile homes all experienced increases in adjusted average annual energy expenditures over the past 9-years (see Figure 2.6). Mobile home households experienced the largest increase, 16.4 percent, from 1984 to 1993. There was a net decrease in energy expenditures in single-family attached homes and in buildings with 5 or more units. In addition to having the lowest average annual energy expenditures, households in apartment buildings with 5 or more units also recorded an overall decrease in energy expenditures of 7.5 percent over the past 9 years.

Figure 2.6. Average Annual Household Energy Expenditures By Type of Housing Unit—Adjusted for Degree-Days and Price Changes, 1984, 1987, 1990, and 1993



Notes: Averages are over all households, including those whose expenditures for some fuels is zero. Petroleum products includes fuel oil, kerosene, and LPG.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-G of the 1984, 1987, 1990, and 1993 Residential Energy Consumption Surveys.

[2]This is, in part, accounted for by the large number of newer homes constructed in milder climates.

Family Income and Heated Floorspace

Adjusted average annual household energy expenditures were directly related to family income and the amount of heated floorspace. Households with the lowest family income and living in smaller housing units expended the least for energy. Households with the highest family income and living in the largest housing units expended the most (see Table 2.1).

Although the changes in average annual energy expenditures from 1984 to 1993 were modest for each of the three income groups presented in Table 2.1, the changes across groups are noteworthy. Households with the lowest family incomes, less than $20,000, experienced a 5-percent increase in expenditures over the 9-year period. In contrast, households having a family income of $50,000 or more experienced a 3-percent decrease. Households having less than 1,000 square feet of heated floorspace experienced a modest 2-percent increase in average energy expenditures from 1984 to 1993. Households having 1,000-1,999 square feet or more than 2,000 square feet of heated floorspace experienced increases in expenditures of 4 percent over the same time period.

Table 2.1. Average Annual Household Energy Expenditures by Annual Family Income and Heated-Square Footage—Adjusted for Degree-Days and Price Changes, 1993

Heated-Square Footage	Annual Family Income			
	Less than $20,000	$20,000 to $49,999	$50,000 or More	All Households
Less than 1,000 Square Feet				
1993	763	833	858	796
1990	749	828	879	783
1987	763	854	909	798
1984	760	807	1,061	779
1,000 to 1,999 Square Feet				
1993	1,077	1,183	1,313	1,172
1990	1,048	1,191	1,354	1,169
1987	1,039	1,151	1,255	1,121
1985	1,031	1,192	1,262	1,122
2,000 or More Square Feet				
1993	1,363	1,489	1,706	1,556
1990	1,247	1,454	1,842	1,567
1987	1,313	1,452	1,698	1,503
1984	1,285	1,461	1,769	1,500
All Households				
1993	957	1,189	1,472	1,166
1990	921	1,161	1,578	1,146
1987	923	1,151	1,455	1,096
1984	914	1,174	1,523	1,074

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457, A-G of the 1984, 1987, 1990, and 1993 Residential Energy Consumption Surveys.

3. Energy Consumption, Expenditures, and End Uses

This section contains analyses of the end uses of the five major sources of energy: electricity, natural gas, fuel oil, liquefied petroleum gas (LPG), and kerosene. Electricity and natural gas are by far the dominant sources of energy. Space heating is a common end use for all energy sources, water heating is commonly powered by electricity or natural gas, and the remaining end uses in the RECS—appliances, air-conditioning, and refrigerators—are mostly end uses of electricity.

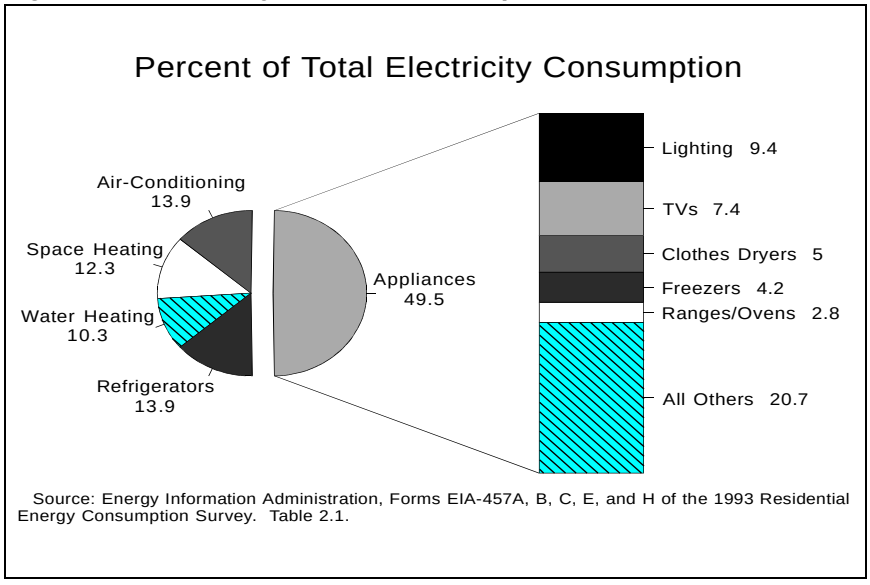
End-Use Consumption of Electricity and Natural Gas

Energy serves a wide range of household needs such as: space heating, cooling, water heating, refrigerators, lighting, and operation of a variety of appliances for entertainment, health, and comfort. For some years, the RECS has estimated the contribution of each of these end uses to total energy consumption. The percentage share and relative ranking of each end use represent how the total consumption of electricity or natural gas is distributed over the end uses. The other commonly used household energy sources (fuel oil, LPG, and kerosene) are used mostly for space heating, water heating, and cooking.

Electricity

The largest use of electricity in the average U.S. household is for appliances, which consume half of all the electricity used in the residential sector (Figure 3.1, Table 3.1). Air-conditioning and refrigerators each consume 14 percent, space heating 12 percent, and water heating 10 percent.

Figure 3.1. Electricity End-Use Consumption, 1993



Source: Energy Information Administration, Forms EIA-457A, B, C, E, and H of the 1993 Residential Energy Consumption Survey. Table 2.1.

No Single Appliance Dominates Use of Electricity

Electricity consumption by appliances is not dominated by any particular type of appliance. Lighting consumes the most electricity (9 percent of the total), followed by TV's (7 percent), clothes dryers (5 percent), and freezers (4 percent). The many other electrical appliances are grouped together and their total consumption shown as "All Others" (Figure 3.1). These include some appliances found in almost all homes but use small amounts of electricity, such as coffee makers, and other appliances that use large amounts of electricity but are not found in many homes, such as swimming pool pumps.

Table 3.1. U.S. Residential End-Use Consumption of Electricity, 1993

End Use/Appliance	Households (millions)	Annual kWh Consumption per Household	Electricity Consumption for 1993			
			Site		Primary (trillion Btu)	Percent
			Billion kWh	Trillion Btu		
Total Households	96.6	9,965	962	3,283	9,891	100.0
Central Air-conditioning System	41.0	2,667	109	373	1,124	11.4
Room Air Conditioners[a]	33.1	738	24	83	251	2.5
Water Heating	37.0	2,671	99	337	1,016	10.3
Main Space-Heating System	25.0	4,541	114	387	1,167	11.8
Secondary Space-Heating	12.1	400	5	17	50	0.5
Refrigerator[a]	115.7	1,155	134	456	1,374	13.9
Appliances (total of list below)	96.6	4,933	477	1,626	4,899	49.5
Lighting (indoor and outdoor)	96.6	940	91	310	933	9.4
TV[a]	198.3	[b]360	71	244	734	7.4
Clothes Dryer	54.7	875	48	163	492	5.0
Freezer	33.4	1,204	40	137	413	4.2
Range/Oven[c]	58.3	458	27	91	274	2.8
Microwave Oven	81.3	[b]191	16	53	160	1.6
Waterbed Heater[a]	14.6	[b]960	14	48	144	1.5
Dishwasher	43.7	[d]299	13	45	135	1.4
Swimming Pool Pump	4.6	[e]2,022	9	32	96	1.0
Clothes Washer	74.5	[b, d]99	7	25	76	0.8
Dehumidifier	9.1	[b]370	3	11	35	0.4
Well Pump	13.0	[b]228	3	10	30	0.3
Personal Computer	22.6	[b]77	2	6	18	0.2
Hot Tub/Spa Heater	1.9	[e]482	1	3	9	0.1
Residual	96.6	1,364	132	450	1,354	13.7

[a]Count of individual units within the household. Room air-conditioners are counted in this table only for units located in homes, which do not have central air-conditioning.

[b]National survey of electric utilities conducted by the American Electric Power Service Corporation, Columbus, Ohio, in 1991.

[c]Households that have an electric range and electric oven and reported that electricity was their main cooking fuel.

[d]Does not include energy used to heat water coming into the washer.

[e]Average of two estimates from Southern California Edison.

Notes: ●"Residual" includes appliances not listed, such as furnace fans (404 kWh per year), heated aquariums, air cleaners, and a myriad of other small electrical appliances. "Residual" also includes errors that may be present in estimates of annual consumption. ●Site electricity is the amount of electricity delivered to households (3,412 Btu per kWh). Primary electricity is site electricity plus the conversion losses in the electric generation process at the utility plant (10,280 Btu per kWh). ●Totals may not equal sum of components due to independent rounding. ●This table does not reflect the interactive effects of appliance usage, especially when mixing the estimates from RECS with those from outside sources. For example, for a home with an electric oven, range, and a microwave, the use of the microwave may not add 191 kWh to the cooking consumption. For more discussion of this problem, see Appendix C, "End-Use Estimation Methodology."

Sources: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-C, E, and H of the 1993 Residential Energy Consumption Survey (RECS), RECS Public-Use Data Files; American Electric Power Service Corporation, and Southern California Edison.

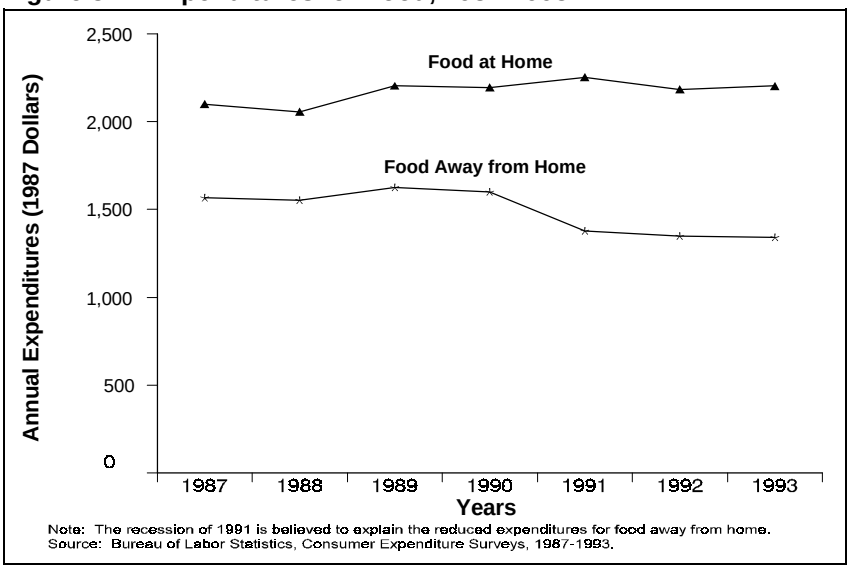
Lighting kWh—First Time U.S. Estimate

The 1993 RECS is the first to provide separate estimates for the annual amount of electricity used for lighting, cooking (range and oven), clothes drying, and dishwashing (see Table 3.1). The estimate for lighting, 940 kWh, includes both indoor and outdoor lighting and is lower than a reported typical, lighting budget for a home, 1,200 to 1,500 kWh.[3] The RECS estimate was considerably below the 2,930 kWh annual lighting budget for the 53 homes (190 asked to participate) that agreed to a study using light loggers, devices placed near the light to measure the cumulative time of light usage. A light logger is a more accurate measuring device for collecting data than respondent reports in the RECS. However, the possibility of bias in the light-logger sample, either the households selected or the lights monitored, may mean that the results did not represent typical households. The RECS estimates for lighting contained some households using that much electricity for lighting, but they were not typical households. One percent of the RECS households used 3,000 kWh or more annually for lighting; 99 percent used less. An annual lighting budget of 1,200 to 1,500 kWh is also not typical for RECS households, as only 27 percent of them used 1,200 or more kWh for lighting.

[3]Bruce Manclark, "Of Sockets, Housecalls, and Hardware," *Home Energy*, November/December 1991, p. 25.

Changes in Home Cooking

Figure 3.2. Expenditures for Food, 1987-1993



Note: The recession of 1991 is believed to explain the reduced expenditures for food away from home.
Source: Bureau of Labor Statistics, Consumer Expenditure Surveys, 1987-1993.

Are Americans doing more or less cooking in the home? This question is important for energy use because changes to cooking appliances are under consideration as part of the Appliance Efficiency Standards Program. Changes must be cost effective, meaning the energy saved over the life of the product must be greater than the increased cost to the consumer of the new energy-saving product. Since the 1993 RECS is the first RECS to isolate electricity used for cooking (458 kWh per year per household), RECS has no past data to compare the 1993 figure against. One indirect measure of change in home cooking is change in expenditures for food purchased for home consumption[4] collected by the Consumer Expenditure Survey, conducted by the Bureau of Labor Statistics (Figure 3.2). Those expenditures have remained stable since 1989 at a level that is somewhat above the 1987-1988 level. Such a trend may mean that energy used for cooking at home has remained the same or increased since 1987. The ratio of expenditures for food away from home and food at home also suggests that the amount of cooking done at home has not decreased.

Calculating a Benchmark for the Annual Consumption of Electricity

By using the annual kWh consumption data from Table 3.1, a benchmark for the expected annual electricity consumption for a typical household can be calculated by adding together the annual consumption estimates for each use of electricity that applies. For example, to obtain a benchmark consumption for households that did not use electricity for space heating but did use it for central air-conditioning, and water heating, used one refrigerator, lighting, TV, microwave oven, dishwasher, and clothes washer, add the kWh consumption for each use (total is 8,382 kWh); then add 1,364 kWh for appliances not enumerated. The total of 9,746 kWh is the expected annual electricity consumed by such households.

Note: This procedure will not work when the characteristics of the households and associated factors, such as climate, are not typical of U.S. households using electricity for these uses. Note that differences in climate could have a large effect on space heating and air-conditioning consumption.

More Refrigerators in 1993 but Less Electricity in Total

The effect of gains in appliance efficiency are readily apparent by comparing the 1990 estimated electricity consumption for refrigerators with 1993 levels of consumption. The average refrigerator consumed an estimated 1,155 kWh in 1993, down from 1,301 kWh in 1990. During this same time, the number of refrigerators in homes increased 3 percent, from 112.6 million in 1990 to 115.7 million in 1993. But the gains in efficiency compensated for the added refrigerators, resulting in a 10-percent reduction in the aggregate amount of electricity used for refrigerators in U.S. homes. Electricity consumption for refrigerators decreased from an estimated 147 billion kWh in 1990 to 134 billion kWh in 1993. New refrigerators have not diminished in size, so reduced volume is not a reason for the decrease in consumption (Figure 3.3) EIA projects an annual decrease in electricity used for refrigerators of 1.8 percent from 1993 to 2010.[5]

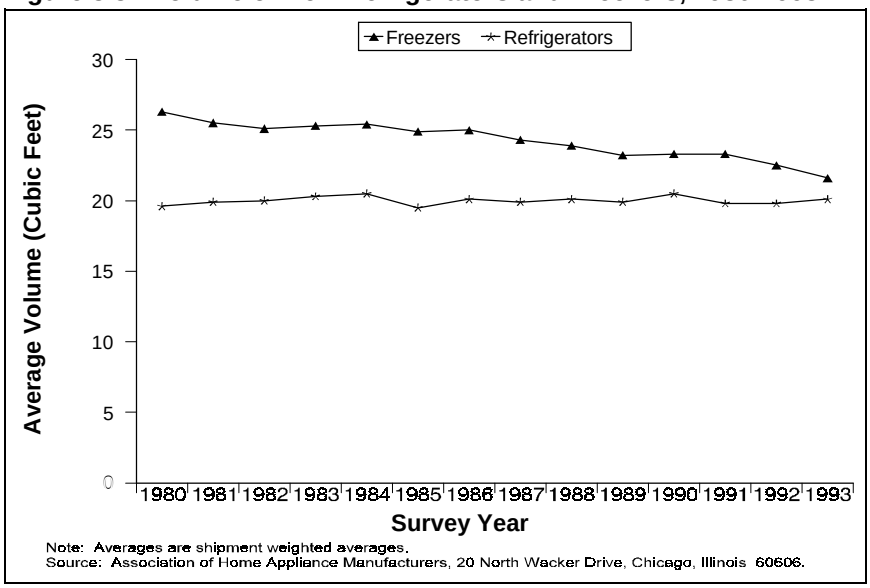
[4] *Food away from home* includes all meals at restaurants, carryouts, and vending machines. *Food at home* refers to food purchased at grocery stores or other food stores and food prepared by the consumer unit on trips.

[5] Energy Information Administration, *Annual Energy Outlook 1995*, DOE/EIA-0383(95), p. 78.

Replacing Old Manual Refrigerators with New Frost-Free Units Is Not Likely to Save Energy

As older refrigerators are replaced by new ones, the effect on energy use depends on factors such as whether the old one is kept in the home as a second refrigerator. Households have not been keeping their old refrigerators, according to the percentage of homes with two or more refrigerators. From 1978 to 1993, the percentage of homes with two or more refrigerators reached a low of 12 percent in 1984, but in 1993 was at the same level (15 percent) that it had been in 1978 (14 percent).[6]

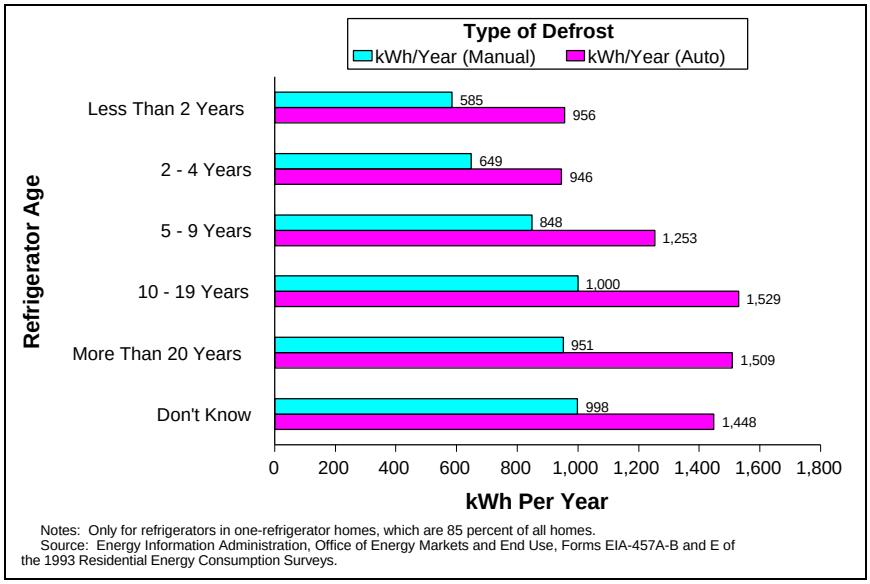
Figure 3.3. Volume of New Refrigerators and Freezers, 1980-1993



Note: Averages are shipment weighted averages.
Source: Association of Home Appliance Manufacturers, 20 North Wacker Drive, Chicago, Illinois 60606.

Another factor affecting energy use is whether the older refrigerator that is being replaced is a manual defrost unit or one that defrosts automatically (or semi-automatically, i.e., by manually pushing a button to begin the defrost cycle). Manual refrigerators do not produce savings in energy usage because they use about the same amount of energy as the new automatic defrost units (Figure 3.4). The low incidence of older manual refrigerators makes it less likely that a new frost-free unit will replace a manual unit (Figure 3.5). Most of the older units, those that are 10 to 19 years old, are automatic defrost units.

Figure 3.4. Energy Use of Refrigerators by Age and Defrost Type, 1993



Notes: Only for refrigerators in one-refrigerator homes, which are 85 percent of all homes.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-B and E of the 1993 Residential Energy Consumption Surveys.

Home Freezers

Unlike refrigerators, which are used in 99.8 percent of all homes, separate freezers were used in only 35 percent of homes in 1993, a lower percentage than the 38 percent of homes with freezers in the early 1980's.[7] EIA has projected an annual decrease in electricity used for freezers of 3.9 percent from 1993 to 2010.[8]

[6]The trend in the percentage of households with two or more refrigerators is available in: Energy Information Administration, *Annual Energy Review*, DOE/EIA-0384(94), Table 2.12.

[7]Trends in the percentage of households with freezers and other home appliances are available in: Energy Information Administration, *Annual Energy Review*, DOE/EIA-0384(94), Table 2.12.

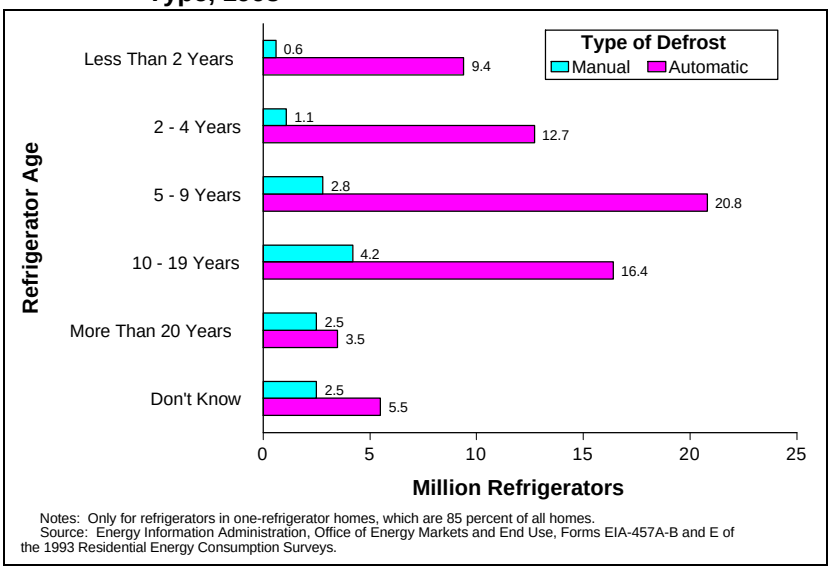
[8]Energy Information Administration, *Annual Energy Outlook 1995*, DOE/EIA-0383(95), p. 78.

Use of Electricity for Appliances Has Been Increasing

Not only do appliances account for the largest share of household electricity usage, but that share is increasing. Electricity consumed for appliances and refrigerators[9] was 22 million Btu per household in 1993, 19 million Btu per household in 1987, and 18 million Btu per household in 1980 (Figure 3.6). The only change in other uses of electricity (space heating, water heating, and air-conditioning) is an increase in electricity used for space heating from 1987 to 1993.

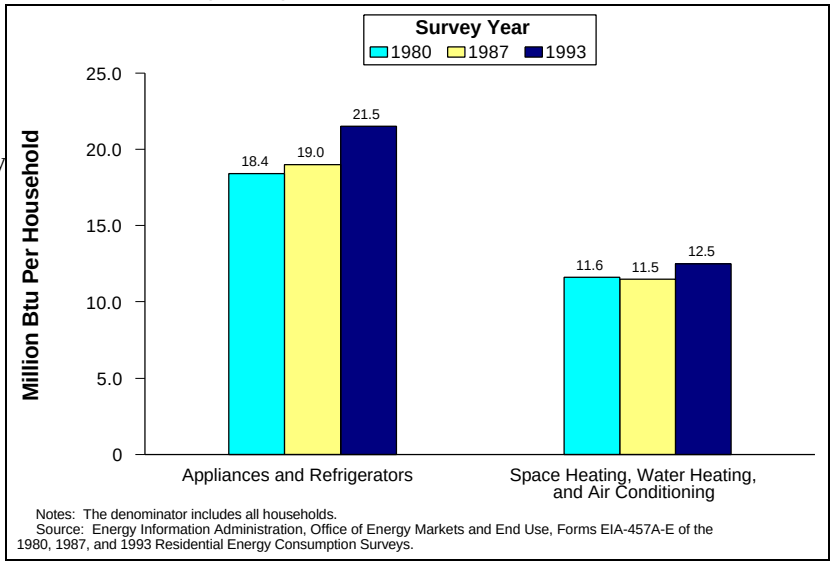
The increase is most likely a result of the use of more electrical appliances (Figure 3.7). RECS identifies only 36 of the many electrical appliances in the home, mainly those that use the most electricity. Among them, microwave ovens showed the largest gain in penetration from 1980 to 1993; in 1980, only 14 percent of households used a microwave, but in 1993, 84 percent of households used a microwave. This gain may not increase electricity consumption in homes already using electricity for cooking,[10] but it would likely increase electricity consumption in the 35 percent of homes that did not cook with electricity in 1993, up from 20 percent in 1980. This effect may not hold true for homes using newer gas ovens that use an electric glow bar instead of a gas pilot light. The glow bar, which operates as long as the burner is lit, may use more electricity than a microwave oven to heat the same thing.[11] Although the increase in use of other electrical appliances was not as dramatic as that of microwaves, homes did use more electrical appliances in 1993 than in 1980 and 1987. The use of personal computers, for example, is increasing. The 1990 RECS, the first to collect data on the use of personal computers, showed that 16 percent of households had a personal computer. By 1993, this percent had increased to 23 percent of homes.[12]

Figure 3.5. Distribution of Refrigerators by Age and Defrost Type, 1993



Notes: Only for refrigerators in one-refrigerator homes, which are 85 percent of all homes.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-B and E of the 1993 Residential Energy Consumption Surveys.

Figure 3.6. Electricity Consumption for Selected End Used, 1980, 1987, and 1993



Notes: The denominator includes all households.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-E of the 1980, 1987, and 1993 Residential Energy Consumption Surveys.

[9]Because consumption for refrigerators was not estimated for the 1980 and 1987 RECS, the appliance end use included consumption for refrigerators. In order to compare appliance consumption for these years with appliance consumption for 1993, the estimates for refrigerators and appliances must be combined for 1993.

[10]Heating foods in a microwave requires less energy than using other technologies. See, Alex Wilson and John Morrill, *Consumer Guide to Home Energy Savings*, 4th edition, American Council for an Energy-Efficient Economy, Washington, DC, 1995, p. 188.

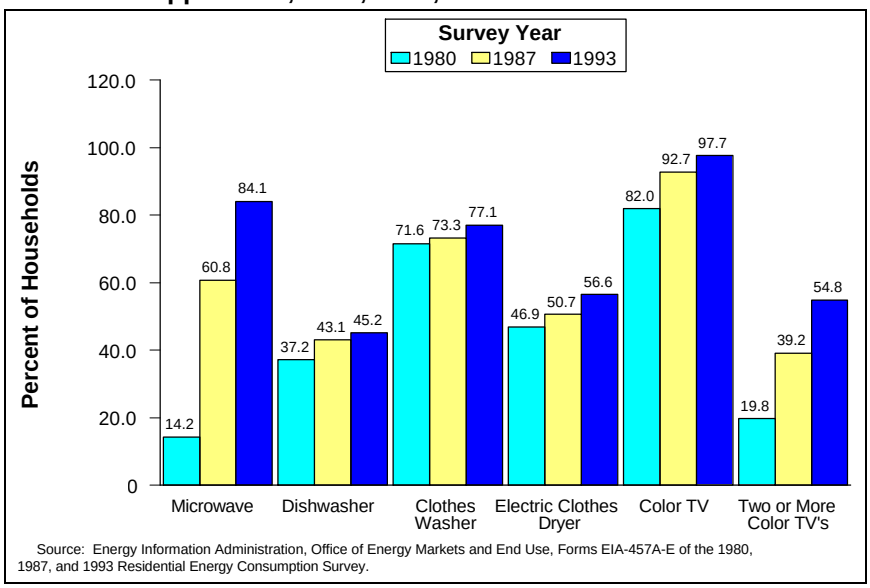
[11]See Brian Pon, "Hot Potato," *Home Energy*, November/December 1993, p.14. It took 110 watt-hours (Wh) to bake a potato in a microwave oven, 140 Wh in a pre-heated gas oven, and 200 Wh in a gas oven with a cold start. These energy readings did not include the value of gas consumed.

[12]For more details on appliances, See Energy Information Administration, *Housing Characteristics 1993*, DOE/EIA-0314(93).

Natural Gas

Natural gas is used predominantly for space and water heating, with space heating accounting for about 70 percent of all household consumption and water heating accounting for 25 percent (Table 3.2). Only 5 percent of natural gas is consumed for cooking, clothes drying, or heating water for hot tubs or swimming pools.

Figure 3.7. Percent of Households with Selected Electrical Appliances, 1980, 1987, and 1993



Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-E of the 1980, 1987, and 1993 Residential Energy Consumption Survey.

Difficult to Estimate Small End Uses of Natural Gas

Unlike electricity, producing acceptable end-use estimates for smaller uses of natural gas, such as cooking and clothes drying, is not possible. The smaller end uses are combined in the appliance component (Table 3.2).

One reason for this difficulty is that space heating dominates the use of natural gas (70 percent of consumption) to such an extent that other smaller end uses are difficult to isolate in the statistical procedures that estimate end-use consumption. The problem of separating end-use consumption is made more difficult with the interactive effects as when cooking with natural gas in the winter decreases the need for space heating. A frequent case was one in which electricity was used for cooking, but not for space heating. Estimating separate end uses for electricity is easier because of its diversity of end uses, with no single end use or appliance dominating (Table 3.1).

Table 3.2. U.S. Residential End-Use Consumption of Natural Gas, 1993

Appliance/End Use	Million Households	Annual Therms[a] Consumed per Household for End Use Indicated	Natural Gas Consumption for 1993	
			Trillion Btu	Percent
Total Households Using Natural Gas	58.7	899	5,274	100
Main Space-Heating	51.4	709	3,644	69
Secondary Space-Heating	1.2	215	26	([b])
Water Heating	51.4	255	1,312	25
Air-Conditioning	0.1	238	2	([b])
Appliances	37.8	77	290	5

[a]A therm is 100,000 Btu.
[b]Less than 0.5 percent.
Note: Appliances include ranges, ovens, clothes dryers, outdoor gas lights and gas grills, hot tubs, and swimming pool heaters.
Sources: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A-C and F of the 1993 Residential Energy Consumption Survey (RECS) and RECS Public Use Data Files.

Energy Consumption in New Homes Constructed from 1988 Through 1993

The use of energy in new homes is of continuing interest to a wide range of groups. A number of nationally and locally sponsored programs promote building energy-efficient homes and manufacturing energy-efficient equipment they will contain. The 1993 RECS sample increased the subsample of new homes by a factor of nearly three over the 1990 RECS subsample to better assess changes in consumption behavior and the effects of climate, energy conservation efforts, and energy prices on residential energy consumption. The 1993 RECS has a sample of 1,139 new homes constructed between 1988 and 1993.

These different measures of intensity have been put together on a scale giving the value for homes built in 1979 or earlier the base value of 100. All other homes are thus compared to how well the pre-1980 homes are doing on various intensity measures.

Intensity Measures

In the following section, energy use in new homes is displayed by using a variety of measures that benchmark specific intensities of energy consumption. Some measures control for more factors than others, making then inherently better able to show change. The intensity measures are:

Space Heating: kWh (Btu for gas) per heating degree-day per 1,000 square feet of heated floorspace

Central Air-Conditioning: kWh per cooling degree-day per 1,000 square feet of cooled floorspace

Water Heating: kWh (Btu for gas) per person in the household

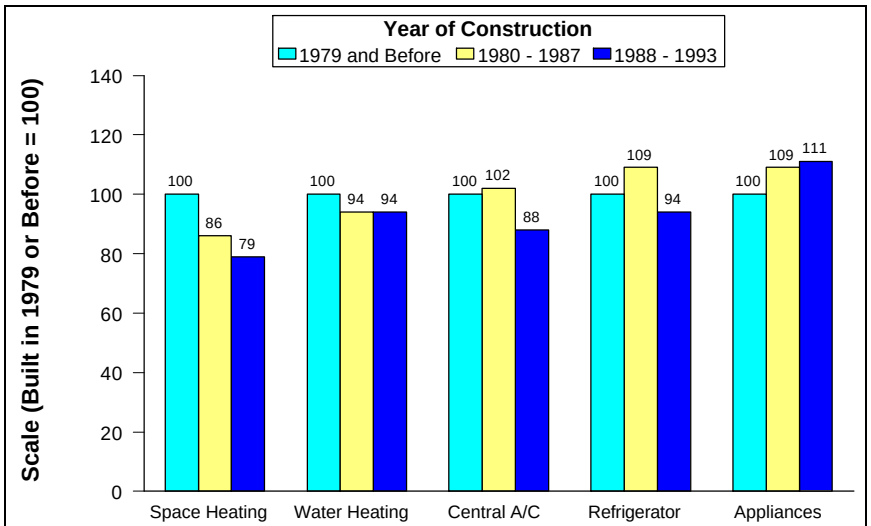
Refrigerators: kWh per refrigerator

Appliances: kWh (Btu for gas) per household

Electricity Consumption

Space Heating. The most consistent drop in electricity intensities is in space heating (Figure 3.8). The drop represents an improvement in intensities, indicating that less energy is being used in newer homes if variations in the weather and the size of the space to be heated are controlled for. The drop signifies that newer homes are built to be more energy efficient and have not suffered from the toll that aging exacts on the capability of the housing shell to counteract the effects of cold weather. Newer homes are more likely to have more efficient electrical heating systems, such as heat pumps; and older electrically heated homes more often have a central electric-resistant warm-air furnace.[13] The improved performance of new homes built since 1988 indicates they are using energy at a rate that is 79 percent of the rate for homes built in 1979 or before.

Figure 3.8. End-Use Electricity Intensities By Year of Construction, 1993



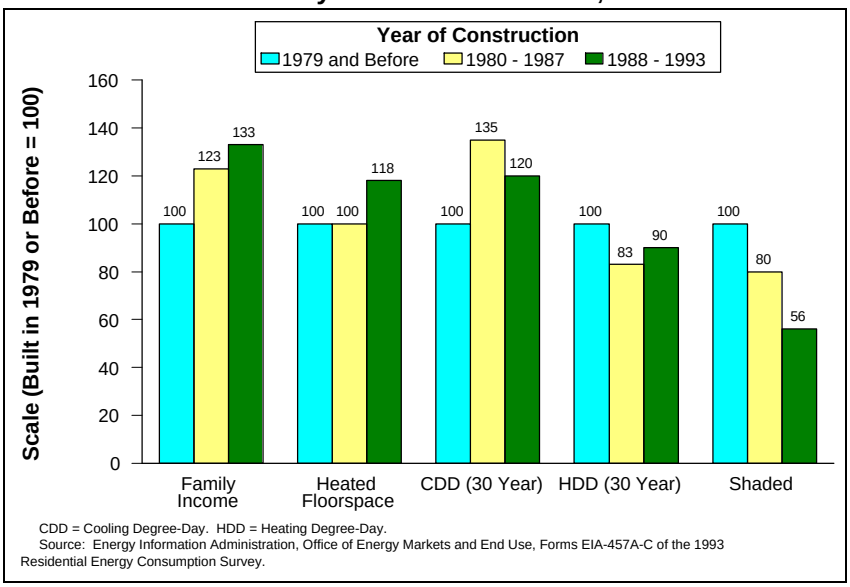
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-C, E, and H of the Residential Energy Consumption Surveys.

Central Air-Conditioning and Water Heating. New homes used electricity less intensively for central air-conditioning and water heating. This probably reflected the improved efficiency of the new equipment. The age of the equipment is inversely related to energy efficiency.

[13] See *Housing Characteristics 1993*, DOE/EIA 0314(93), Table 3.8a, for the type of electric heating equipment by year of construction.

It is interesting to note that very new homes are much less likely to be shaded from the afternoon sun than are older, more established homes (Figure 3.9). This factor would generally lead to higher energy use to mitigate the effects of direct sunlight.[14] However, the analysis of these RECS data did not show any effect of shading on air-conditioning usage, even when the cooling degree-days, window versus central equipment, and usage patterns are held constant. This may be due to the fact that the RECS questionnaire contained only one general question about shading. About one-quarter of new homes are shaded, compared with homes built before 1980; half of the homes built before 1980 are now shaded.[15]

Figure 3.9. Indices for Impact of Climate, Shading, Floorspace, and Income by Year of Construction, 1993



CDD = Cooling Degree-Day. HDD = Heating Degree-Day.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-C of the 1993 Residential Energy Consumption Survey.

Refrigerators. New homes with newer equipment use less energy for their refrigerators than homes built before 1980.

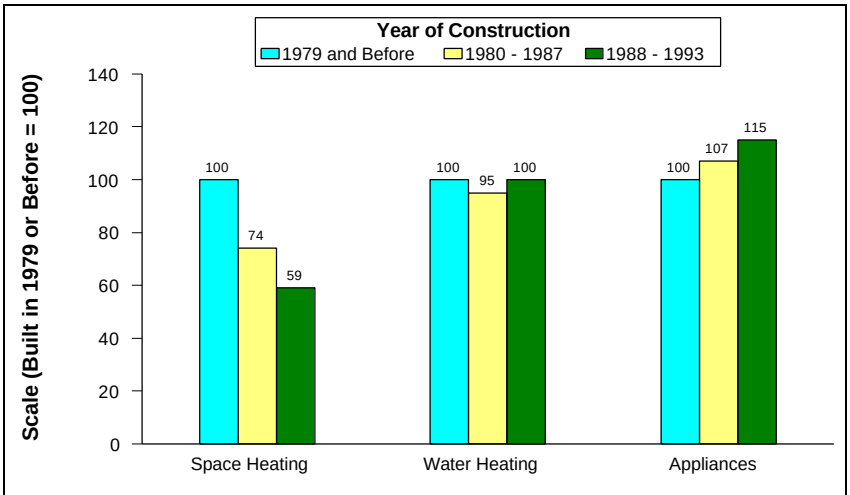
Appliances. New homes use more electricity for appliances. This may reflect the fact that the income levels of households in new homes is higher than for older homes and they can afford a greater variety of appliances (Figure 3.9). Consumption of electricity for appliances, which in general constitutes about half of the average electricity bill, is the single greatest source of increased electricity consumption in new homes.

Natural Gas Consumption

The largest gains in improved intensity for consumption of natural gas is with space heating (Figure 3.10). Consumption intensity in new homes is 59 percent of the intensity of homes built before 1980.

Changes in intensity of the consumption for water heating have been marginal. And, although more natural gas is consumed for appliances in new homes, relatively fewer new homes use natural gas for appliances.[16] Natural gas used for appliances includes its use in clothes dryers, for cooking, outdoor grills or lights, and heaters for hot tubs or swimming pools.

Figure 3.10. Natural Gas End-Use Intensities by Year of Construction, 1993



CDD = Cooling Degree-Day. HDD = Heating Degree-Day.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-C and F of the 1993 Residential Energy Consumption Survey.

[14] See Hashem Akbari et al., "Measured Savings in Air-Conditioning from Shade Trees and White Surfaces" in *ACEEE 1992 Summer Study on Energy Efficiency in Buildings*, Vol. 9, pp. 1-10.

[15] See *Housing Characteristics 1993*, DOE/EIA 0314(93), Table 3.29b.

[16] Among homes that use natural gas for any purpose, 66 percent use it for appliances in homes built before 1980, 62 percent in homes built from 1980 to 1987, and 54 percent in homes built from 1988 to 1993.

Summary

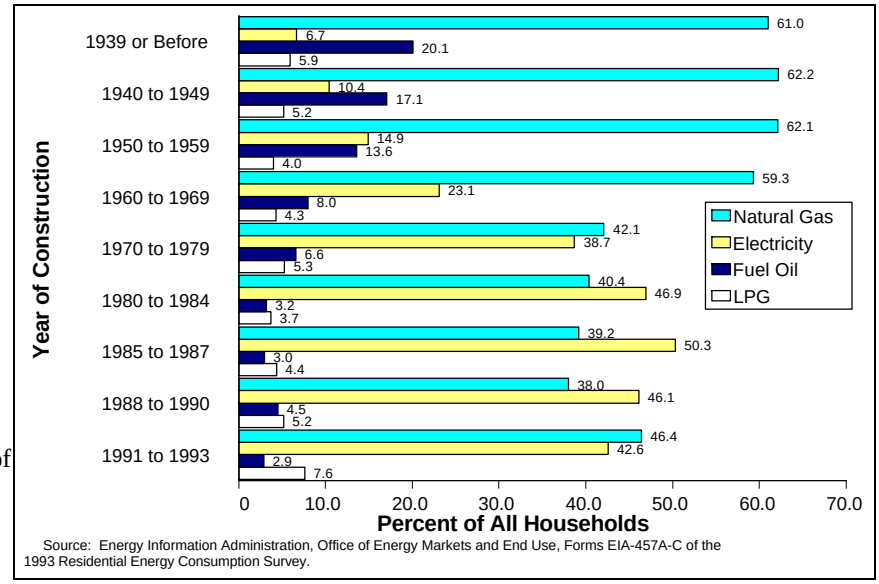
New homes show the greatest improvement in the intensity of energy for space heating. Both electrically heated homes and natural gas-heated homes use energy less intensively for space heating than homes built before 1980. New homes' heating equipment is the most efficient and their shells are better insulated, so this improvement is to be expected. A number of States have adopted new building codes, which also contributes to this improvement.[17] RECS does not collect data on the efficiency of the stock of heating equipment, so age of the equipment must be used as the surrogate measure of equipment efficiency. New homes are larger than homes built in the past (Figure 3.9).

New homes show a slight improvement in the intensity of electricity for water heating, central air-conditioning, and refrigerators, but their use of natural gas for water heating has shown little improvement in intensity in new homes. New homes use more electricity for appliances than homes built before 1980.

Changes in Main Space-Heating Fuel

Every RECS has reported that the majority of housing units use natural gas as their main space- heating fuel. This is primarily because natural gas dominates the pre-1970 housing stock, which accounts for about 57 percent of the total residential housing units. Figure 3.11 shows the percentage of households using natural gas, electricity, fuel oil, and liquefied petroleum gas as the main space-heating fuel by the year of construction.

Figure 3.11. Main Space-Heating Fuel by Year of Construction, 1993



Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-C of the 1993 Residential Energy Consumption Survey.

There are two components of change in main space-heating fuel—fuel choice in new buildings and conversion in existing units. Among housing units built before 1970, natural gas is the predominant space-heating fuel, used in more than half of the housing units. Among housing units built during the 1970's, natural gas and electricity use are nearly even, with each fuel found in a little over 40 percent of all households. Electricity dominates in homes built during the 1980's. For housing units constructed in 1991 through 1993, natural gas is again found in the majority of housing units.

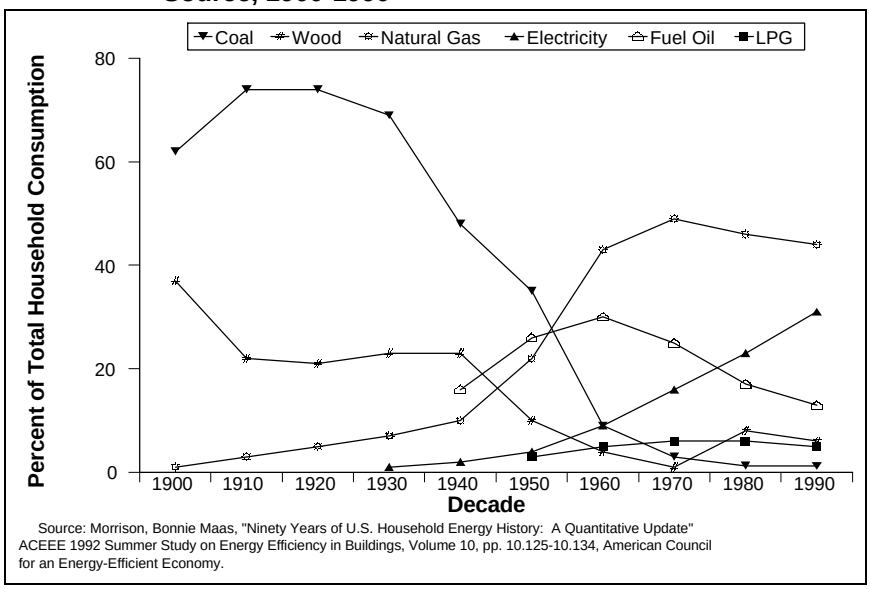
The RECS data do not distinguish between the households that chose their space-heating fuel at the time the unit was constructed and the homes that converted to a different fuel some time after the unit was constructed. However, other data sources[18] (presented in Figures 3.12 and 3.13) suggest that the majority of housing units constructed before the 1960's (the first three series in Figure 3.11) must have converted from another fuel (most likely coal or wood). On the other hand, the distribution of space-heating fuels among housing units constructed in 1960 or later (the bottom half of Figure 3.11) reflects primarily the choice of space heating fuel at the time of construction.

[17] For up-to-date information about State activity in adopting new building energy standards, call Pacific Northwest Laboratory's 24-hour hotline (800-270-2633).

[18] Morrison, Bonnie Maas, "Ninety Years of U.S. Household Energy History: A Quantitative Update" ACEEE 1992 Summer Study on Energy Efficiency in Buildings, Volume 10, pp. 10.125-10.134, American Council for an Energy-Efficient Economy; U.S. Bureau of the Census, Current Construction Report, Series C25, U.S. Department of Commerce, Washington, DC.

Figure 3.12 shows the change throughout the 20th century in the percentage of all household fuel consumption accounted for by coal, wood, natural gas, electricity, and fuel oil. Prior to the 1950's, coal accounted for the majority of household energy consumption, followed by wood. In the 1950's, the use of natural gas and fuel oil began to increase. By the 1960's, natural gas was the predominant household fuel. Electricity consumption began to rise in the 1960's, surpassed the use of fuel oil in the 1980's and has increased steadily ever since.

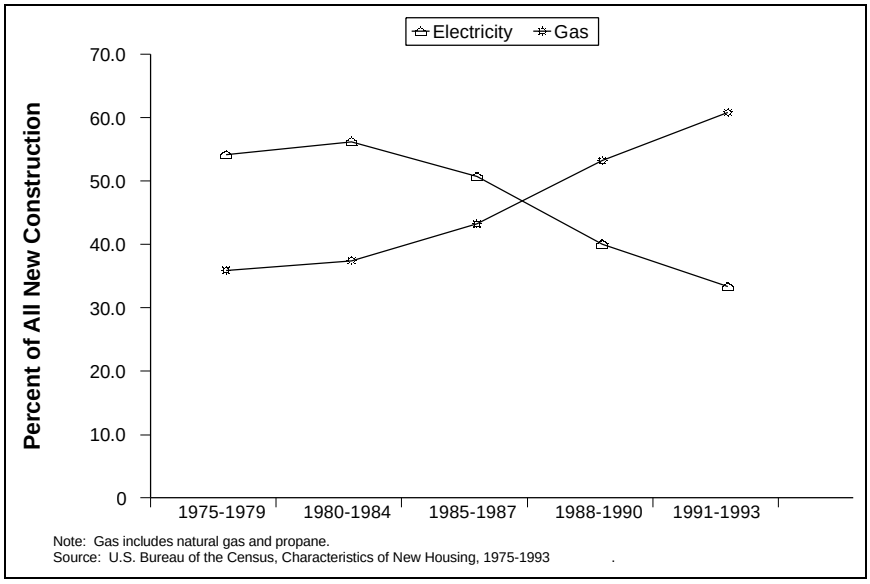
Figure 3.12. Total Household Energy Consumption by Energy Source, 1900-1990



Source: Morrison, Bonnie Maas, "Ninety Years of U.S. Household Energy History: A Quantitative Update" ACEEE 1992 Summer Study on Energy Efficiency in Buildings, Volume 10, pp. 10.125-10.134, American Council for an Energy-Efficient Economy.

Figure 3.13 shows the change over the past 18 years in the fuels used in newly constructed housing units.[19] For those housing units constructed between 1975 and 1987, the majority have electricity for their main space-heating fuel. Among housing units built in 1988 or later, natural gas was the predominant fuel. Although the RECS data do not show natural gas regaining its prominence until 1991-1993, both Figures 3.11 and 3.13 reflect a similar trend of an increase in the number of households using electricity, followed by a resurgence of the use of natural gas.

Figure 3.13. Main Space-Heating Fuel in U.S. Single-Family and Multifamily Housing Units Constructed Between 1975 and 1993



Note: Gas includes natural gas and propane.
Source: U.S. Bureau of the Census, Characteristics of New Housing, 1975-1993 .

The RECS data are not suited for showing conversions in main space-heating fuel, because respondents are not asked if they have changed their main space-heating fuel. However, data from the American Gas Association[20] do suggest that housing units are converting to natural gas. For example, in 1982, nearly 250,000 housing units coverted to natural gas—mostly from oil. Throughout the 1980's, an increasing number of households converting to natural gas converted from electricity. For example, in 1982, the number of housing units converting to natural gas from electricity was less than 25,000. By 1992, the annual number had increased to close to 100,000.

[19] U.S. Bureau of the Census, Current Construction Reports, Series C25 *Characteristics of New Housing: 1993*, U.S. Department of Commerce, Washington, DC, 1994.

[20] American Gas Association, *Residential Natural Gas Market Survey, 1992*.

Do Homes with Natural Gas Water Heaters Use More Hot Water than Homes with Electric Water Heaters?

The answer seems to be "No," based on water usage indicators (Table 3.3). Homes using different water-heating fuels do not differ much in number of household members, one of the most important determinants of hot water usage. Nor do they differ much in the loads of laundry or loads of dishes washed, in the number of showers or baths, or number of meals cooked. It is possible that homes differ in other ways such as the length or temperature of showers taken or use of cold water for laundry. But those differences would probably have to be dramatic to overcome the similarity in bathing and laundry usage.

Table 3.3. Water Usage Indicators by Main Water-Heating Energy Source, 1993
(Percent of Households)

Usage Indicators	Main Water-Heating Energy Source		
	Electricity	Natural Gas	Other Fuel or No Water Heating
Household Size			
1 Person	24.9	23.8	25.1
2 Persons	35.2	31.4	30.8
3 Persons	16.6	17.4	18.1
4 Persons	13.4	16.4	14.4
5 or more Persons	9.9	10.9	11.5
Loads of Laundry Washed Each Week			
Less than 1 Load	0.1	0.1	0.1
1 to 5 Loads	38.5	37.4	36.5
6 to 10 Loads	27.1	25.3	23.6
11 to 15 Loads	8.3	9.2	9.6
16 or more Loads	4.4	4.5	4.9
No Washing Machine	21.6	23.5	25.2
Dishwasher Use			
Less than Once a Week	3.1	2.1	1.5
A Few Times a Week	24.9	21.0	15.3
Several Times a Week	11.0	13.5	9.3
Every Day	7.3	7.6	8.5
More than Every Day	0.7	1.4	0.8
No Dishwasher	53.1	54.4	64.6
Number of Showers/Baths Taken Each Week			
9 or Fewer	29.9	29.0	29.8
10 to 20	43.9	42.5	41.7
21 or more	26.2	25.8	25.3
Not Applicable	NC	NC	3.2
Number of Hot Meals Cooked in the House			
2 or More a Day	35.0	35.9	39.5
1 a Day	44.1	43.8	48.3
A Few a Week	16.5	16.4	10.4
About 1 a Week	2.5	1.9	1.1
Less than 1 a Week	7.8	2.0	0.3
Not Applicable	0.2	0.1	0.4

NC = No cases in sample.

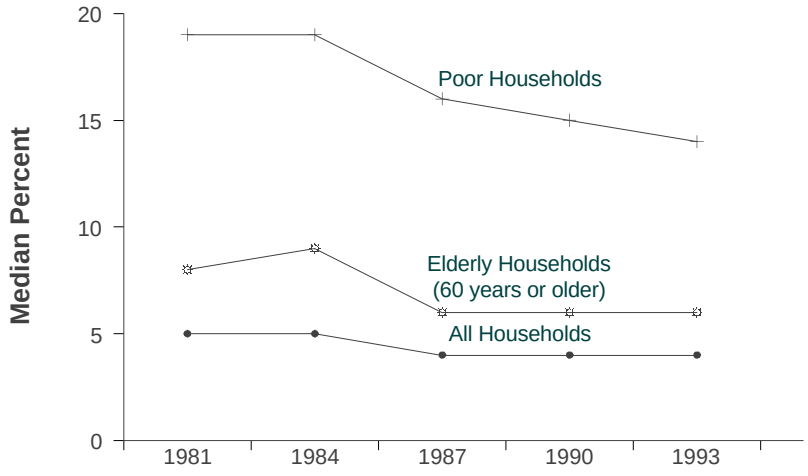
Note: Because of independent rounding, data may not sum to totals.

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-H of the 1993 Residential Energy Consumption Survey.

Percent of Income Spent on Energy

For 1993, the median percent of income spent on energy, not including transportation, was 4 percent for all households, 6 percent for elderly households, and 14 percent for low-income households (i.e., those below the poverty line) (Figure 3.14). The difference between the low-income group and all households has diminished somewhat since 1981.[21] Over this period of time, poverty household income (in constant dollars) rose slightly, while energy expenditures (in constant dollars) were lower at the end of the period.

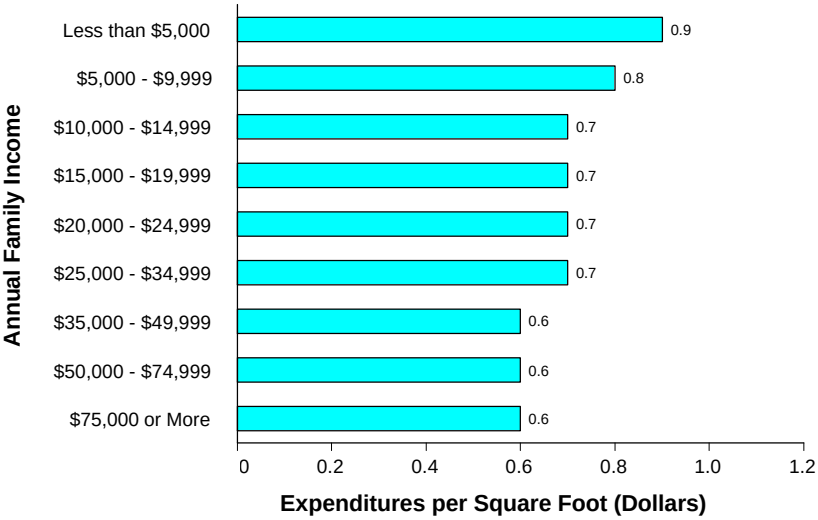
Figure 3.14. Percent of Income spent on Energy, 1981-1993



Note: Energy does not include transportation. Poor is below 100 percent of poverty.
Source: Energy Information Administration, Forms EIA-457 of the 1981, 1984, 1987, 1990, and 1993 Residential Energy Consumption Survey.

Although households in the lowest income group were paying annually about one-third less for the energy they used compared to households in the upper income groups, they were paying about one-third more on a square foot basis than the upper income groups (Figure 3.15). The lowest income group paid $991 for home energy in 1993 compared to $1,493 for households earning between $50,000 and $74,999, but they paid $0.88 per square foot compared to $0.63 per square foot paid by the higher income group. The reason for this is that low income households live in smaller homes. Smaller homes, by nature, have higher energy costs on a square-foot basis (Table 5.1).

Figure 3.15. Energy Expenditures per Square Foot, 1993



Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-C of the 1993 Residential Energy Consumption Survey, Table 3.1.

[21] For further analysis of these trends, see Administration for Children and Families, *Low Income Home Energy Assistance Program Report to Congress for Fiscal Year 1992*, January 1994, Appendices E and K. For income in constant dollars, see p. 164. For constant dollar expenditures for 1979 to 1990, see p. 168.

4. Special Analyses

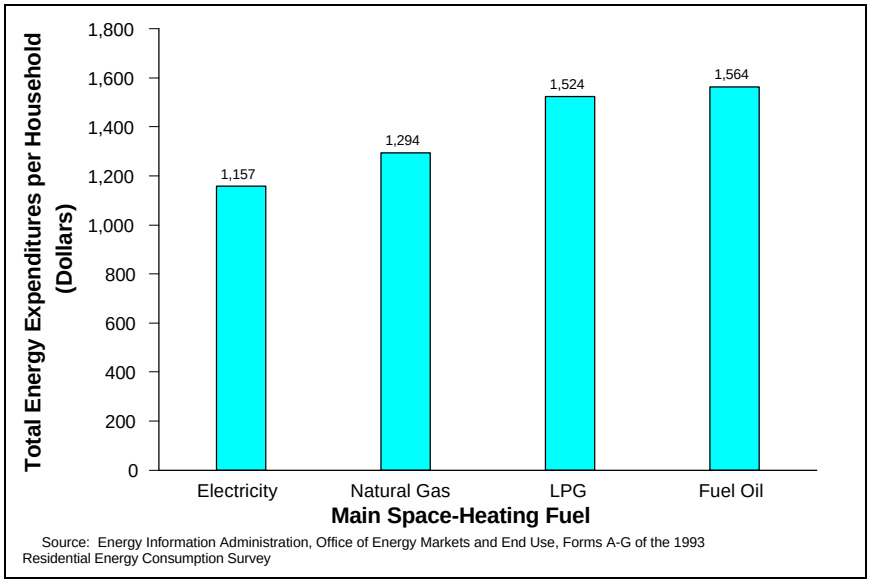
This section highlights studies that have narrow focuses—a comparison of all-electric homes and mixed-fuel homes, expenditures and consumption in the four most populous States, and expenditures and consumption in the five climate zones in the United States.

All-Electric Homes and Mixed-Fuel Homes

Table 5.10 shows that electricity costs more per million Btu than any other fuel, but households that use electricity as their main space-heating fuel have lower overall energy expenditures than households that heat with other fuels (Figure 4.1). This section discusses some of the reasons for this apparent contradiction.

Households that heat with electricity use fewer Btu than households that heat with other fuels. For example, households that use electricity for main space heating consume 3,207 Btu per heating degree-day per 1,000 square feet of floorspace. In contrast, households that heat with natural gas consume 8,652 Btu per heating degree-day per 1,000 square feet of floorspace. This difference is reversed when one considers primary energy. The Btu value for electricity is then 9,662 Btu in primary energy.

Figure 4.1. Total Energy Expenditures by Main Space-Heating Fuel, 1993



Source: Energy Information Administration, Office of Energy Markets and End Use, Forms A-G of the 1993 Residential Energy Consumption Survey

Households that use only electricity tend to be newer and to have cheaper electric rates than mixed-fuel homes. More of them are located in the South, where space-heating demands are lower. Table 4.1 describes the characteristics, consumption, and expenditures of three different types of households, defined by the types of energy they use:

All-Electric households use only electricity for all end uses.

Some Electric households use some electricity for space heating or water heating and use at least one other type of fuel.

Fossil-Fuel households use fossil fuels (natural gas, fuel oil, LPG, etc.) for both space heating and water heating.

Table 4.1. Characteristics of Households by Type of Fuel Consumption, 1993

	All Electric	Some Electric	Fossil Fuel
Total Energy Expenditures (dollars)	1,145	1,349	1,299
Cost of Electricity per Kilowatthour (cents)	7.3	8.3	9.6
Heating Degree-Days	3,528	4,639	4,908
Cooling Degree-Days	1,807	1,299	1,139
Heated Square Footage	1,410	1,685	1,689
Percent Single-Family Detached Homes	46%	71%	63%
Percent Built After 1970	74%	38%	33%

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-G of the 1993 Residential Energy Consumption Survey.

Not only do mixed-fuel households have more of the characteristics that increase consumption, such as more heating degree-days and older building shells, but they also use large amounts of electricity for air-conditioning, refrigeration, and appliances. Table 4.2 shows the electricity consumption and expenditures, by end use, for the three household types.

Table 4.2. Electricity Consumption and Expenditures by Household Type, 1993

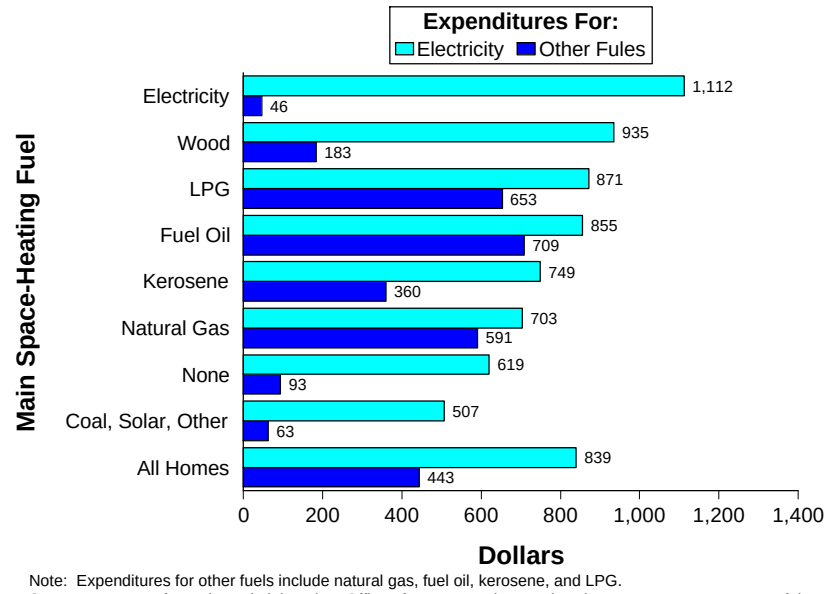
	All Electric	Some Electric	Fossil Fuel
Total Consumption (kilowatthours)	15,639	10,700	7,152
Space-Heating	4,672	910	0
Water Heating	2,500	1,709	0
Air-Conditioning	2,075	1,338	1,131
Refrigeration	1,433	1,388	1,359
Appliances	4,958	5,355	4,662
Total Expenditures (dollars)	1,145	885	684
Space-Heating	330	73	0
Water Heating	183	137	0
Air-Conditioning	160	109	104
Refrigeration	109	118	134
Appliances	364	448	447

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-C and E of the 1993 Residential Energy Consumption Survey.

Electricity Expenditures Dominate Total Household Energy Expenditures

Regardless of main space-heating fuel, U.S. households spend more on electricity than on all other fuels combined. In particular, households that heat with natural gas spend $703 per year on electricity but spend only $591 per year on other fuels, including natural gas.

Figure 4.2. Expenditures for Electricity and Other Fuels, 1993



Note: Expenditures for other fuels include natural gas, fuel oil, kerosene, and LPG.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-H of the 1993 Residential Energy Consumption Survey

Evaluating the Energy Value of Electricity Consumption

Electricity consumption can be expressed in terms of either

- Physical units, most commonly kilowatthours, or
- a common thermal unit, most commonly British thermal units (Btu).

The physical unit provides a clear understanding of the amount of a particular energy source being used, while the thermal unit is a measure of convenience used to aggregate or compare various energy sources measured in different physical units. Converting kilowatthours of electricity to Btu is not a trivial issue, because the amount of input energy needed to create a kilowatthour of electricity is far greater than the amount of useful energy in the kilowatthour at its point of use (in the RECS, the housing unit). Therefore, meaningful conversions of electricity use from kilowatthour to Btu can be given in terms of:

- Site (point of use) electricity at the universal value of 3,412 Btu per kilowatthour. This measurement is most useful to engineers, energy managers, building owners and others trying to improve energy efficiency.
- Primary (embodied) electricity, at a value that reflects the content of the energy inputs used to produce the electricity. This rate is most useful to policymakers and analysts who are considering global resources and environmental issues. (It is about 3 times the amount of site-electricity use, as discussed below.)

For convenience and consistency, the factor used in this report to convert electricity use to primary energy is 10,280 Btu per kilowatthour. This factor represents the approximate average energy input of the generation process for fossil-fuel utility plants in the United States in 1993 (Energy Information Administration,*Monthly Energy Review* [April 1995]). Note: Specific conversion values for the range of electricity estimates in this report are unknown. Applying the single value to the range of electricity estimates in this report provides only a rough approximation of primary electricity because:

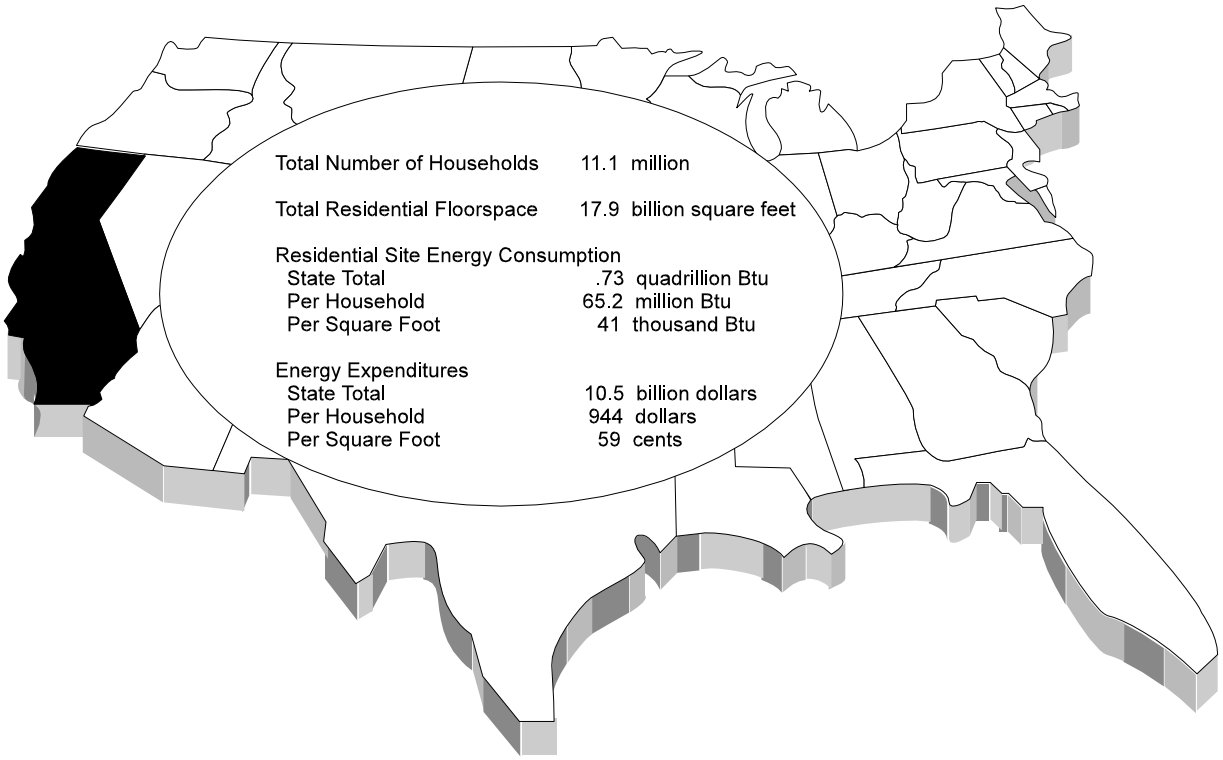
- for some types of utility-energy inputs, hydroelectric, wood/waste, wind, and solar (thermal or photovoltaic), there is not generally accepted conversion rate
- the fossil-fueled, nuclear and geothermal generation processes have known, but different, conversion rates, so the overall conversion rate for these energy sources is a function of their mix.

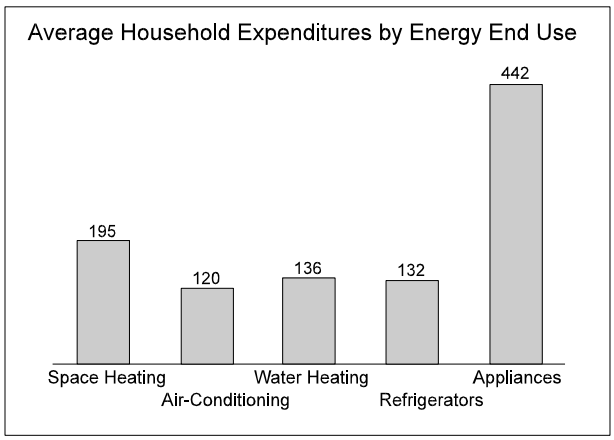
Estimates of primary electricity using this conversion factor should thus be treated with caution. They should be considered rough alternative measures to site energy as indicators of the importance of electricity in the residential sector.

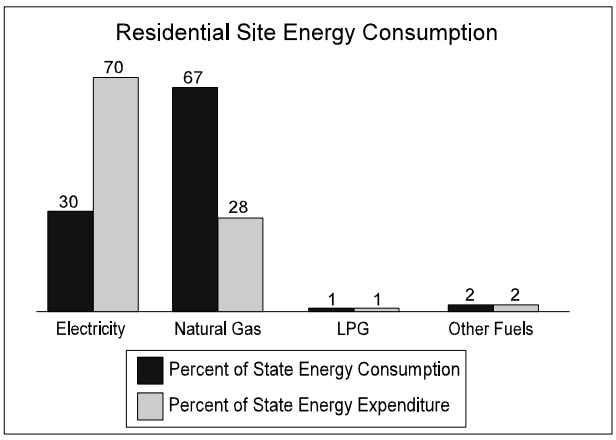
RECS State-Level Highlights

The 1993 RECS is the first RECS to publish any data at the State level. The sample for the 1993 RECS was designed to provide State-level estimates for the four most populous States: California, Florida, New York, and Texas. The tables in the Detailed Tables section of this report, include these 4 States as a stub item. In addition, the following data provides a consumption and expenditure profile for each of the four States. The household energy end use expenditures are averaged over the households that perform the end use of interest. For example, only 57 percent of New York households have air-conditioning. Therefore, the expenditures are averaged over these households only, not over all households in the State. The RECS sample size will support State-level data for only these four States, and not for any other States. To publish State-level data for all 50 States would require increasing the RECS sample size by a factor of 5.

California



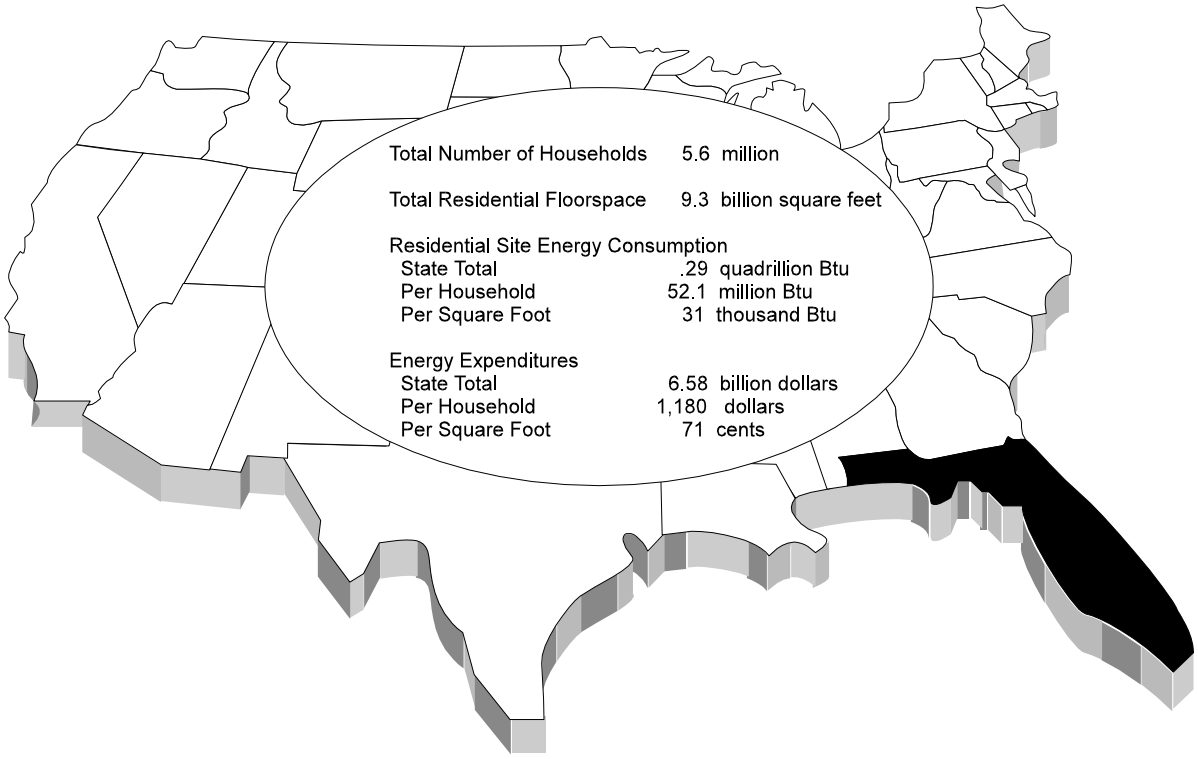


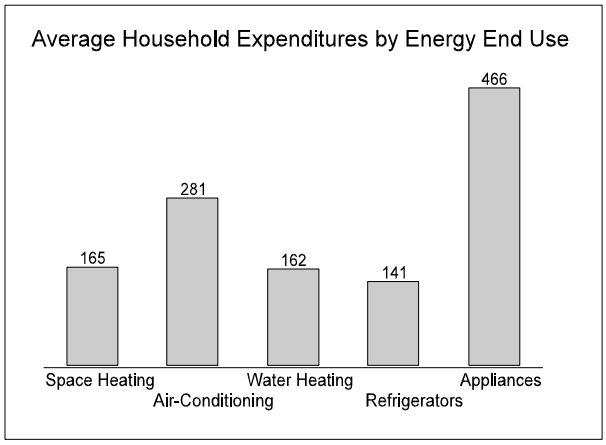


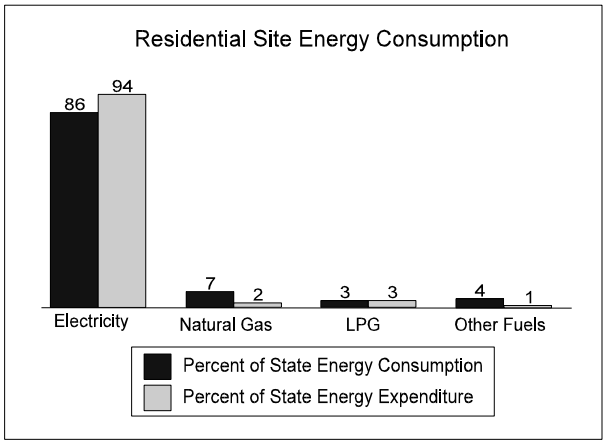
Note: The Percent of State Energy Consumption includes site electricity. When the percentages are recalculated using primary electricity, they more closely resemble the expenditures. Electricity accounts for 57 percent, natural gas for 41 percent, and LPG and other fuels each account for one percent.

Source: Energy Information Administration, Office of Energy Markets and End Use, 1993 Residential Energy Consumption Survey.

Florida



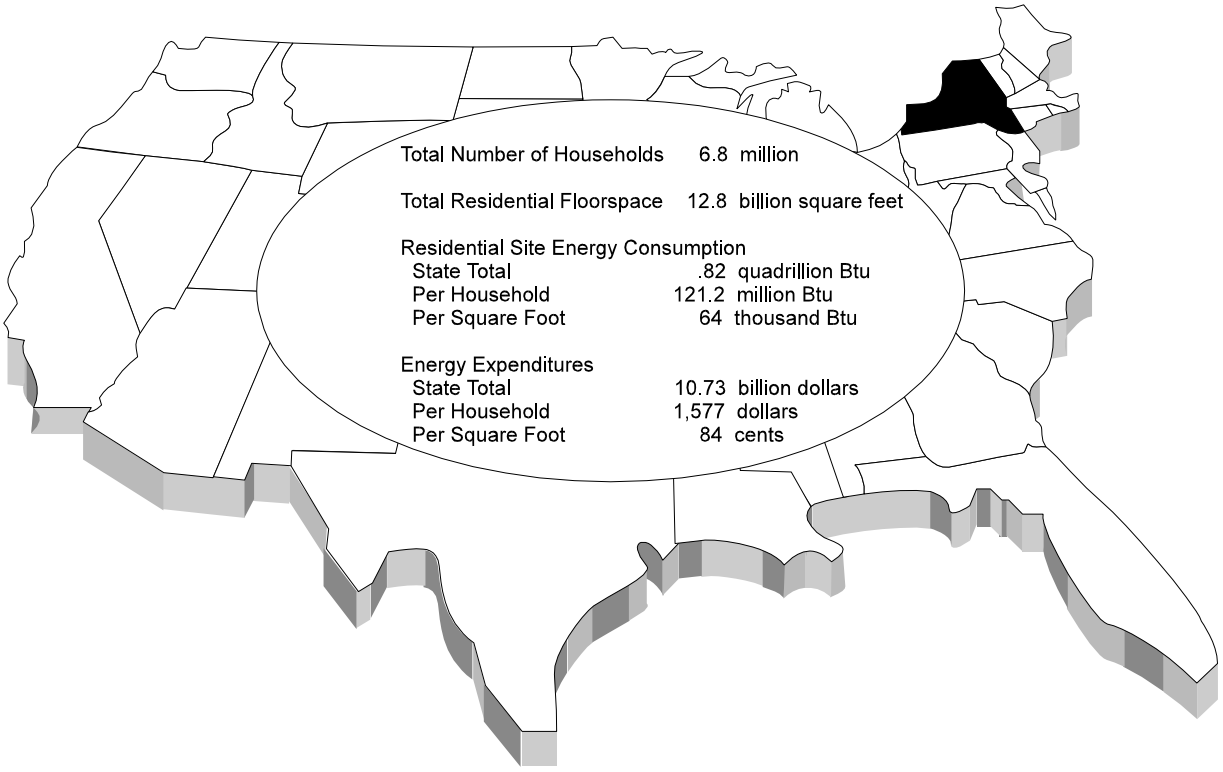


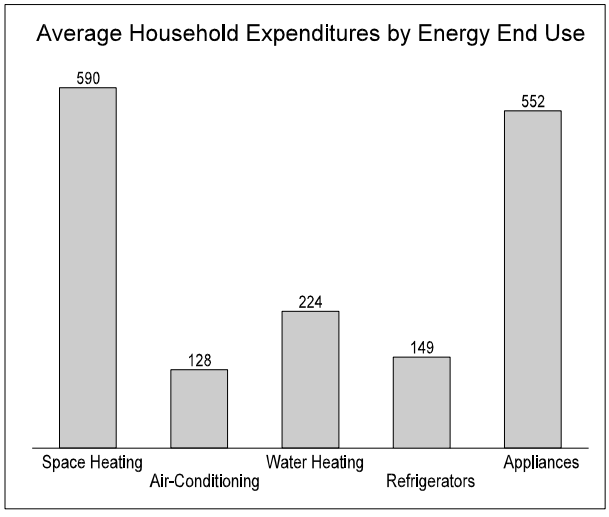


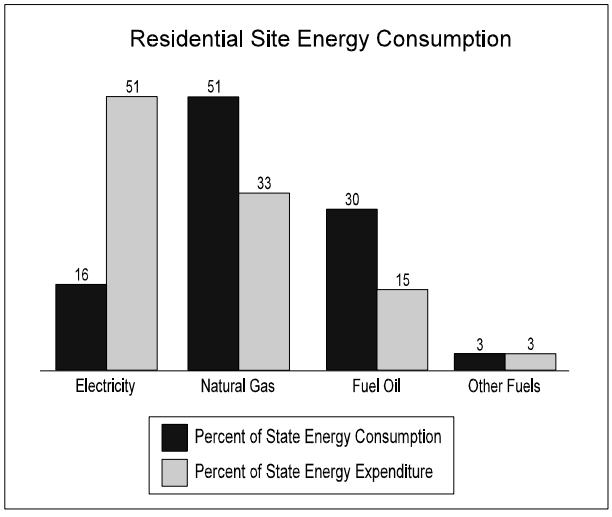
Note: The Percent of State Energy Consumption includes site electricity. When the percentages are recalculated using primary electricity, they more closely resemble the expenditures. Electricity accounts for 95 percent, natural gas for 3 percent, and LPG and other fuels each account for one percent.

Source: Energy Information Administration, Office of Energy Markets and End Use, 1993 Residential Energy Consumption Survey.

New York



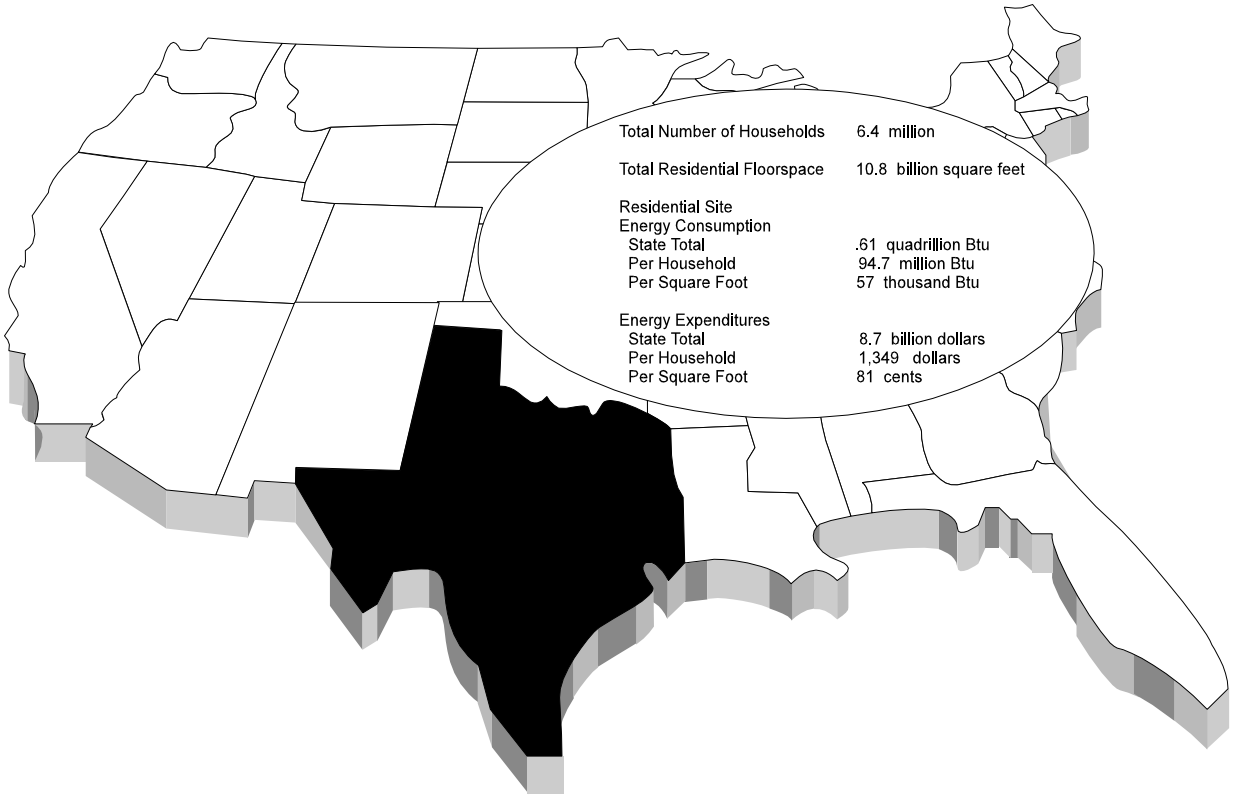


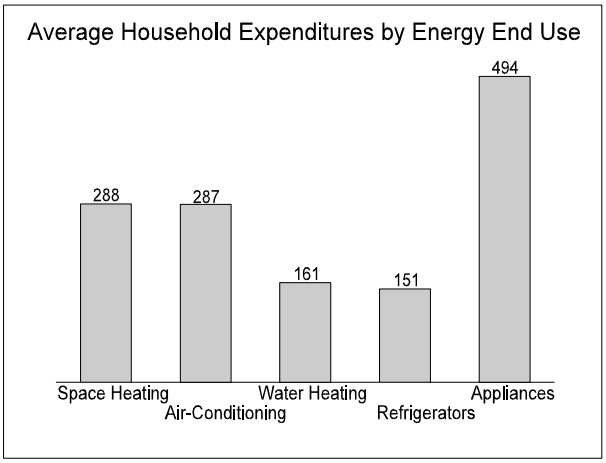


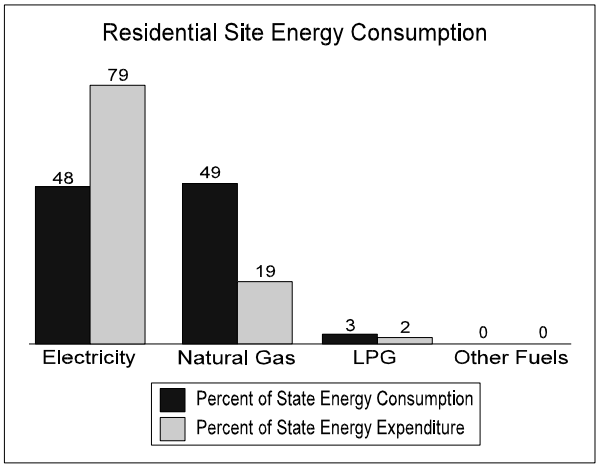
Note: The Percent of State Energy Consumption includes site electricity. When the percentages are recalculated using primary electricity, they more closely resemble the expenditures. Electricity accounts for 37 percent, natural gas for 39 percent, fuel oil for 23 percent, and other fuels for one percent.

Source: Energy Information Administration, Office of Energy Markets and End Use, 1993 Residential Energy Consumption Survey.

Texas







Note: The Percent of State Energy Consumption includes site electricity. When the percentages are recalculated using primary electricity, they more closely resemble the expenditures. Electricity accounts for 73 percent, natural gas for 25 percent, LPG for two percent, and other fuels for a negligible percent.

Source: Energy Information Administration, Office of Energy Markets and End Use, 1993 Residential Energy Consumption Survey.

Energy Consumption, Expenditures, and Climate

One of the most significant factors influencing energy consumption is climate—the length and intensity of the heating and cooling seasons. The United States is divided into five climate zones (see map in Appendix F) based on the average number of heating degree-days and cooling degree-days over a 30-year period. Climate zones do not follow State boundaries, because climate is affected by elevation, proximity to coast lines, latitude, and other physical features. An examination of energy consumption and expenditures in different climate zones reveals different patterns of energy use and different mixes of energy sources.

Coldest Zone

- Populated by 8.7 million households, the fewest of all climate zones and 9 percent of national total
- Consumed 124 million Btu of energy per household from all major sources, or 56 thousand Btu per square foot (Figure 5.1)
- Spent, on average, $1,254 per household for all major sources of energy, only $28 less than the national average per household of $1,282, but these figures do not indicate the cost of wood fuel
- Used more wood as an energy source—three cords per household on average—than households in other climate zones (Table 5.9).

Table 4.3. Average Energy Consumption and Expenditures per Household—Coldest Zone, 1993

End Use	Percent of Households Using Energy for the End Use	Consumption (million Btu)	Expenditures
Space-Heating	98[a]	80.9	$517
Air-Conditioning	46	2.9	$ 64
Water Heating	99	19.5	$193
Refrigerators	100	3.9	$ 91
Appliances	100	20.4	$437

[a]Remaining 2 percent use coal, wood, or an energy source other than electricity, gas, or oil for space heating.

Source: Energy Information Administration, Office of Energy Markets and End Use, Tables 5.12. and 5.13 of the 1993 Residential Energy Consumption Survey.

Cold Zone

- Populated by 26.5 million households, the most of any climate zone and 27 percent of national total
- Consumed one-third of all national residential energy—a total of 129.2 million Btu per household, or 62 thousand Btu per square foot. In comparison, the national average is 55 thousand Btu per square foot, and 103.6 million Btu per household (Figure 5.1)
- Spent a total of $12.52 billion on natural gas—42 percent of the national residential total (Table 5.3)
- Consumed 2.14 quadrillion Btu of natural gas, 41 percent of the national total (Table 5.2).

Table 4.4. Average Energy Consumption and Expenditures per Household—Cold Zone, 1993

End Use	Percent of Households Using Energy for the End Use	Consumption (million Btu)	Expenditures
Space-Heating	99[a]	80.4	$543
Air-Conditioning	58	4.2	$108
Water Heating	100	22.5	$185
Refrigerators	100	4.3	$115
Appliances	100	20.3	$455

[a]Remaining 1 percent use coal, wood, or an energy source other than electricity, gas, or oil for space heating.
Source: Energy Information Administration, Office of Energy Markets and End Use, Tables 5.12. and 5.13 of the 1993 Residential Energy Consumption Survey.

Moderate Zone

- Populated by 22.5 million households, 23 percent of the national total
- Consumed an average of 108.3 million Btu of major energy sources per household, compared with the national average of 103.6 million Btu per household (Figure 5.1)
- Consumed 55 thousand Btu per square foot, the same as the national average (Figure 5.1)
- Spent $2.71 billion on 3.02 billion gallons of fuel oil, the highest total expenditure and the greatest total consumption of any climate zone (Tables 5.2 and 5.3).

Table 4.5. Average Energy Consumption and Expenditures per Household—Moderate Zone, 1993

End Use	Percent of Households Using Energy for the End Use	Consumption (million Btu)	Expenditures
Space-Heating	99[a]	61.3	$488
Air-Conditioning	71	6.2	$160
Water Heating	99	19.9	$189
Refrigerators	100	4.5	$123
Appliances	100	19.6	$456

[a]Remaining 1 percent use coal, wood, or an energy source other than electricity, gas, or oil for space heating.
Source: Energy Information Administration, Office of Energy Markets and End Use, Tables 5.12. and 5.13 of the 1993 Residential Energy Consumption Survey.

Warm Zone

- Populated by 17.8 million households, 18 percent of the national total
- Consumed 78.5 million Btu per household of all energy sources—less than any other climate zone—compared with national average of 103.6 million Btu (Figure 5.1)
- Spent less than other climate zones for energy, $1,107 per household compared with the national average of $1,282 (Figure 5.1).

Table 4.6. Average Energy Consumption and Expenditures per Household—Warm Zone, 1993

End Use	Percent of Households Using Energy for the End Use	Consumption (million Btu)	Expenditures
Space-Heating	97[a]	35.0	$292
Air-Conditioning	58	7.5	$179
Water Heating	99	17.5	$160
Refrigerators	100	4.6	$128
Appliances	100	18.3	$434

[a]Remaining 3 percent use wood for space heating or do no space heating.

Source: Energy Information Administration, Office of Energy Markets and End Use, Tables 5.12. and 5.13 of the 1993 Residential Energy Consumption Survey.

Warmest Zone

- Populated by 21.2 million households, 22 percent of the national total
- Consumed less energy per household for space heating than any other climate zone, and more for air-conditioning
- Consumed the greatest amount of electricity of all climate zones, 42.6 million Btu per household, compared with the national average of 34.0 million Btu per household (Table 5.4).

Table 4.7. Average Energy Consumption and Expenditures per Household—Warmest Zone, 1993

End Use	Percent of Households Using Energy for the End Use	Consumption (million Btu)	Expenditures
Space-Heating	97[a]	27.5	$253
Air-Conditioning	85	11.5	$275
Water Heating	99	14.9	$162
Refrigerators	100	5.9	$147
Appliances	100	21.9	$479

[a]Remaining 3 percent use wood for space heating or do no space heating.

Source: Energy Information Administration, Office of Energy Markets and End Use, Tables 5.12. and 5.13 of the 1993 Residential Energy Consumption Survey.

5. Detailed Tables

The following 28 tables present detailed data describing the consumption of and expenditures for energy used by households in the residential sector. The data are presented at the national level, Census region and division levels, for climate zones and for the most populous States, as well as for other selected characteristics of households. This section provides assistance in reading the tables by explaining some of the headings for the categories of data. It also explains the use of the row and column factors to compute the relative standard error of the estimates given in the tables. The section concludes with a "Quick-Reference Guide" to the statistics in the different tables.

Organization of the Tables

The tables cover consumption and expenditures for six topical areas:

- Major Energy Source
- Space-Heating End Use
- Air-Conditioning End Use
- Water-Heating End Use
- Refrigerator End Use
- Appliance End Use

The tables displaying data by major source (Tables 5.1 through 5.10) present household energy consumption and expenditure data that were obtained from the energy suppliers of the households. The tables present the average consumption and expenditures for all energy sources, followed by tables displaying statistics on individual energy sources. Statistics are provided both for the aggregate of all households and by per-household averages.

The tables presenting data by total end use and by space heating, air-conditioning, water heating, refrigerators, and appliances (Tables 5.11 through 5.28) contain nonlinear regression estimates of energy consumption and expenditures. Details concerning the methodology used for the end-use estimates are in Appendix C, "End-Use Estimation Methodology." Data are presented for a total of all energy sources, followed by tables displaying statistics for each energy source. Statistics are provided both by all households and per household averages.

Categories of Data in the Table Rows

The row categories classify data by specific features of the households. The following, listed in alphabetical order, are explanations of some of the row categories that may require clarification.

Below Poverty Line (100 Percent and 125 Percent)—Low-income classifications to which certain households are assigned. "Below 100 percent of poverty line" includes households with incomes below the poverty level as defined by the U.S. Bureau of the Census and the Office of Management and Budget. "Below 125 percent of poverty" includes households with incomes below 125 percent of the poverty level. These groups of the poor and near-poor represent alternative levels for defining poverty. The poverty line varies with the number of family members in the household and the income of the entire family. (See **Eligible for Federal Assistance** below.)

Census Region—Four regions as defined by the U.S. Bureau of Census. For a map showing the four Census regions (and nine Census divisions), see Appendix F. For a listing of the States included in each Census region (and division), see the Glossary.

Climate Zone—One of five climatically distinct areas, defined by long-term weather conditions affecting the heating and cooling loads in buildings. The zones were developed by the Energy End Use and Integrated Statistics Division (EEUISD) from seven distinct climate categories originally identified by the American Institute of Architects (AIA) for the U.S. Department of Energy and the U.S. Department of Housing and Urban Development. The zones were determined according to the 30-year average (1961-1990) of the annual heating and cooling degree-days (base 65 degrees Fahrenheit). For a map, see Appendix F. For additional details, see the Glossary.

Eligible for Federal Assistance—Households are categorized as eligible for federal energy assistance if their income is below the federal maximum standard. The Federal standard is 150 percent of the poverty line or 60 percent of statewide median income, whichever is the higher income. Individual States can set the standard at a lower level than the federal maximum. (See **Below Poverty Line** above.)

Family Income—The total combined income (before taxes and deductions) of all members of the family from all sources, for the 12 months prior to the interview. This definition includes the total income of all family members who lived in the household during the 12 months prior to the interview, regardless of whether they were living there at the time of the interview. For additional details, see **Family Income Category** in the Glossary.

Heated Floorspace—The portion of floorspace that is heated during most of the winter season. Rooms that are shut off during the heating season to save fuel are not counted as heated square footage. Attached garages that are unheated and unheated areas in basements and attics are not counted as heated floorspace.

Ownership of Housing Unit describes the relationship of a housing unit's occupants to the structure itself, not the land on which the structure is sited. "Owned" means the owner or co-owner is a member of the household and the housing unit is either fully paid for or mortgaged. A household is classified "rented" even if the rent is paid by someone not living in the unit. "Rent-free" means the unit is not owned and no money is paid or contracted for rent. Such units are usually provided in exchange for services rendered or as an allowance or favor from a relative or friend not living in the unit. Unless shown separately, rent-free households are grouped with rented households.

Type of Housing Unit—"Single-Family Housing Unit" is a unit that provides living space for one household or family. The structure may be detached or attached to another unit. Attached houses are considered single-family houses as long as the house itself is not divided into more than one housing unit and has an independent outside entrance. A single-family house is contained within walls that go from the basement or the ground floor (if there is no basement) to the roof. (A mobile home with one or more rooms added is classified as a single-family home.) Townhouses, rowhouses, and duplexes are considered single-family attached housing units, as long as there is no household living above another one within the walls that go from the basement to the roof to separate the units.

"Multifamily (two to four units)" is a housing unit in a building with two to four housing units—a structure that is divided into living quarters for two, three, or four families or households and in which one household lives above another. This category also includes houses originally intended for occupancy by one family (or for some other use) that have been converted into separate dwellings for two to four families. Typical arrangements in these types of living quarters are separate apartments downstairs and upstairs or one apartment on each of three or four floors.

"Multifamily (five or more units)" is a housing unit in a building with five or more housing units—a structure that is divided into living quarters for five or more families or households and in which one household lives above another.

"Mobile Home" is a housing unit built on a movable chassis and moved to the site. It may be placed on a permanent or temporary foundation and may contain one or more rooms. If rooms are added to the structure, it is considered a single-family housing unit. A manufactured house assembled on site is a single-family housing unit, not a mobile home.

Statistical Significance of Data

Row and Column Factors

The tables provide row factors in the far-right column and column factors on the top line of each table. These factors are to be used to determine the Relative Standard Error (RSE) for each estimate, which, in turn, can be used to determine the standard error and the confidence level of the estimate and to determine whether the difference between any two figures is statistically significant. However, since the RSE's are only approximate, standard errors, confidence intervals, and statistical tests must also be regarded as only approximate. For more details about the derivation of the row and column RSE factors, see Appendix B, "Quality of the Data."

To calculate the RSE for a specific estimate, multiply the row factor by the column factor, as illustrated in Figure 5.1, an excerpt from Table 5.10 of this report. This table shows that the average expenditure for natural gas in 1993 among U. S. households that were located in suburban areas was $6.03 per million Btu. Multiplying 1.9 (the row factor) by 0.8 (the column factor) yields an approximate RSE of 1.52 percent.

Figure 5.1. Use of RSE Row and Column Factors

Table 5.10. Average Expenditures for Major Energy Sources in U.S. Households, 1993
(Dollars per Million Btu)

Characteristics	Major Energy Sources	Electricity	Natural Gas	Fuel Oil	Kerosene	Liquefied Petroleum Gas	RSE Row Factors
RSE Column Factors:	1.0	0.8	0.8	0.8	1.3	1.7	
Largest Populated States							
California	14.47	32.86	6.09	Q	Q	15.42	2.2
Florida	22.63	24.41	8.48	Q	9.52	16.00	5.9
New York	13.01	40.62	8.37	6.28	7.79	13.83	3.1
Texas	14.24	23.52	5.54	NC	Q	8.98	5.6
Urban Status							
Urban	12.35	25.70	6.17	6.48	8.21	10.92	1.7
Central City	11.84	26.99	6.35	5.94	7.87	12.28	2.5
Suburban	12.67	25.55	6.03	6.67	8.38	10.72	1.9
Rural	12.50	21.82	5.55	6.41	8.96	9.62	2.3
Climate Zone							
Under 2,000 CDD and—Over 7,000 HDD	10.11	22.19	5.39	6.31	7.69	9.51	2.7
5,500 to 7,000 HDD	10.50	25.15	5.85	6.52	8.17	9.10	3.5
4,000 to 5,499 HDD	12.54	24.75	6.82	6.47	8.95	9.92	3.7
Under 4,000 HDD	14.10	25.91	6.20	6.53	8.04	11.12	3.8
2,000 CDD or More and—Under 4,000 HDD	16.03	24.27	5.90	Q	8.97	11.31	3.2

Source: Energy Information Administration, Office of Energy Markets and End Use, the 1993 Residential Energy Consumption Survey.

Standard Errors

Since the estimates presented in the following tables are based on a sample of residential housing units, they are subject to sampling error, or standard error. To determine the standard error for an estimate in these tables, multiply the approximate RSE by the estimate. For example, to determine the standard error of the average expenditures for natural gas in 1993 among U.S. households located in suburban areas, multiply $6.03 per million Btu by .0152 (the approximate RSE). The result, $0.09 per million Btu, is the approximate standard error for the estimate.

Confidence Levels

For each of the estimates given in the tables, a 95-percent confidence range can be determined with the estimate at the mid-point. To calculate the 95-percent confidence range for a given figure:

1. Multiply the RSE row factor by the RSE column factor to determine the approximate RSE.

2. Multiply the approximate RSE (divided by 100) by the estimate given in the table to determine the approximate standard error.

3. Multiply the result by 1.96 to determine approximate 2 standard errors.

4. Subtract the result of Step 3 from the given estimate to determine the bottom of the range.

5. Add the result of Step 3 to the given estimate to determine the top of the range.

The result of these steps will yield a range with the property where by, in repeated surveys, the estimate would fall in the range constructed in this way 95 percent of the time.

For example, to determine the confidence range for the estimated average expenditures for natural gas of $6.03 per million Btu in 1993 among U.S. households located in the suburban areas:

1. Multiply 1.9 (the RSE row factor) by 0.8 (the RSE column factor), which yields 1.52 percent (the approximate RSE).

2. Multiply .0152 (the approximate RSE) by $6.03 per million Btu (the estimate), which yields $0.091656 per million Btu (the approximate standard error).

3. Multiply $0.091656 per million Btu by 1.96, which yields $0.18 per million Btu (approximate 2 standard errors).

4. To determine the bottom of the range, subtract $0.18 per million Btu from $6.03 per million Btu, which yields $5.85 per million Btu.

5. To determine the top of the range, add $0.18 per million Btu to $6.03 per million Btu, which yields $6.21 per million Btu.

It can then be said with 95-percent confidence that, in 1993, the average expenditures for natural gas among U.S. households located in suburban areas fell between $5.85 and $6.21 per million Btu.

Statistical Significance Between Two Statistics

The difference between any two estimates given in the detailed tables may or may not be statistically significant. Statistical significance for the difference between two independent variables is computed as:

$$S_{x_1 - x_2} = \sqrt{[S_{x_1}]^2 + [S_{x_2}]^2}$$

where S is the standard error, x_1 is the first estimate, and x_2 is the second estimate. The result of this computation is to be multiplied by 1.96, and if this result is less than the difference between the two estimates, the difference is statistically significant.

For example, the average expenditures for natural gas among U.S. households located in suburban areas in 1993 was $6.03 per million Btu. The comparable amount for U.S. households located in rural areas was $5.55 per million Btu, an estimated difference of $0.48 per million Btu. The standard error for the $6.03 per million Btu suburban estimate (x_1) is $0.09, and the standard error for the $5.55 per million Btu rural estimate (x_2) is $0.10:

$$S_{x_1-x_2} = \sqrt{0.09^2 + 0.10^2}$$

$$S_{x_1-x_2} = 0.13$$

Multiplying $0.13 by 1.96 yields $0.26 per million Btu. Since $0.26 per million Btu is less than the $0.48 per million Btu difference between the 1993 suburban and rural natural gas estimates, the difference is statistically significant.

Quick-Reference Guide

Following is a Quick-Reference Guide that lists the table headings covered in the detailed tables and shows the table number for each of the tables.

Quick-Reference Guide

Table 5.1. Consumption and Expenditures in U.S. Households, 1993

Characteristics	Total Households (million)	Residential Buildings: Total Number (million)	Residential Buildings: Total Floorspace (billion sq. ft.)	Average of Major Energy Sources [1]: Consumption: per Building (million Btu)	Consumption: per Square Foot (thousand Btu)	Consumption: per Household (million Btu)	Consumption: per Household Member (million Btu)	Expenditures (dollars): per Building	Expenditures (dollars): per Square Foot	Expenditures (dollars): per Household	Expenditures (dollars): per Household Member	RSE Row Factors
RSE Column Factors:	1.4	1.4	1.4	1.0	0.8	1.0	1.0	0.9	0.8	0.8	0.8	
Total U.S. Households	**96.6**	**76.5**	**181.2**	**131**	**55**	**103.6**	**40**	**1,620**	**0.68**	**1,282**	**491**	**1.3**
Census Region and Division												
Northeast	19.5	13.8	40.1	173	60	122.4	47	2,157	.74	1,526	583	2.4
New England	5.1	3.7	10.6	168	59	123.1	48	2,094	.73	1,532	598	4.1
Middle Atlantic	14.4	10.1	29.4	175	60	122.1	46	2,181	.75	1,523	578	2.9
Midwest	23.3	19.0	50.6	165	62	134.3	52	1,640	.62	1,336	521	2.3
East North Central	16.4	13.1	35.3	173	64	138.8	54	1,697	.63	1,358	526	2.5
West North Central	6.9	5.9	15.2	146	56	123.8	49	1,512	.58	1,282	508	4.6
South	33.5	28.4	57.1	104	52	87.9	34	1,540	.76	1,304	503	2.5
South Atlantic	17.4	14.2	29.9	95	45	77.8	31	1,577	.75	1,288	506	3.5
East South Central	6.0	5.5	10.8	104	53	94.9	37	1,315	.67	1,200	463	4.3
West South Central	10.1	8.7	16.5	118	62	101.1	38	1,619	.86	1,391	522	4.6
West	20.4	15.4	33.5	101	46	76.0	28	1,263	.58	953	353	2.6
Mountain	5.4	4.4	9.3	118	57	98.1	38	1,236	.59	1,025	396	4.3
Pacific	15.0	10.9	24.2	94	42	68.2	25	1,274	.58	928	338	3.3
Largest Populated States												
California	11.1	8.0	17.9	91	41	65.2	23	1,313	.59	944	330	3.5
Florida	5.6	4.3	9.3	67	31	52.1	20	1,527	.71	1,180	453	5.7
New York	6.8	3.7	12.8	225	64	121.2	45	2,925	.84	1,577	590	4.7
Texas	6.4	5.4	10.8	114	57	94.7	36	1,622	.81	1,349	506	6.2
Urban Status												
Urban	75.8	57.2	140.5	137	56	103.2	39	1,689	.69	1,275	488	1.5
Central City	30.6	19.8	47.1	151	63	97.6	38	1,785	.75	1,155	455	2.4
Suburban	45.2	37.4	93.4	129	52	107.0	40	1,639	.66	1,356	509	1.7
Rural	20.8	19.3	40.7	113	54	104.7	40	1,415	.67	1,309	501	2.6
Climate Zone [2]												
Under 2,000 CDD and Over 7,000 HDD	8.7	7.6	19.3	142	56	124.0	48	1,434	.57	1,254	481	4.8
5,500 to 7,000 HDD	26.5	20.4	55.2	168	62	129.2	51	1,762	.65	1,356	534	3.6
4,000 to 5,499 HDD	22.5	17.0	44.0	143	55	108.3	42	1,796	.69	1,359	521	4.4
Under 4,000 HDD	17.8	13.9	28.5	101	49	78.5	29	1,419	.69	1,107	408	4.9
2,000 CDD or More and Under 4,000 HDD	21.2	17.6	34.2	95	49	79.0	30	1,525	.79	1,267	482	3.8
Type of Housing Unit												
Single-Family	66.8	66.8	152.2	119	52	118.5	43	1,441	.63	1,441	517	1.4
Detached	59.5	59.5	139.1	121	52	121.2	43	1,462	.63	1,462	520	1.5
Attached	7.3	7.3	13.1	96	53	96.3	37	1,266	.70	1,266	487	4.7
Mobile Home	5.6	5.6	5.4	82	84	81.9	31	1,203	1.23	1,203	454	4.3
Multifamily	24.2	4.1	23.6	398	69	67.3	32	5,108	.89	863	406	3.0
2 to 4 Units	8.0	2.9	9.6	276	83	99.5	41	3,085	.93	1,112	461	4.4
5 or More Units	16.2	1.2	14.0	692	60	51.5	26	9,951	.86	740	373	3.7
Heated Floorspace (square feet)												
Fewer than 1,000	29.3	15.3	24.2	128	81	66.7	31	1,675	1.06	875	411	2.3
1,000 to 1,999	40.2	34.6	68.2	117	59	100.7	37	1,492	.76	1,286	473	1.6
2,000 to 2,999	17.8	17.4	48.6	140	50	136.6	47	1,661	.60	1,622	552	2.1
3,000 or More	9.3	9.1	40.3	172	39	168.8	55	1,936	.44	1,901	620	3.6

See footnotes at end of table.

Table 5.1. Consumption and Expenditures in U.S. Households, 1993 (Continued)

Characteristics	Total Households (million)	Residential Buildings: Total Number (million)	Residential Buildings: Total Floorspace (billion sq. ft.)	Average of Major Energy Sources [1]: Consumption: per Building (million Btu)	Consumption: per Square Foot (thousand Btu)	Consumption: per Household (million Btu)	Consumption: per Household Member (million Btu)	Expenditures (dollars): per Building	Expenditures (dollars): per Square Foot	Expenditures (dollars): per Household	Expenditures (dollars): per Household Member	RSE Row Factors
RSE Column Factors:	1.4	1.4	1.4	1.0	0.8	1.0	1.0	0.9	0.8	0.8	0.8	
Total Number of Rooms (Excluding Bathrooms)												
1 or 2	3.2	0.7	1.7	195	78	41.3	29	2,702	1.08	574	409	7.9
3 to 5	47.4	31.0	59.6	122	63	79.6	35	1,578	.82	1,032	451	1.8
6 to 8	40.2	39.1	97.7	130	52	126.3	42	1,572	.63	1,529	514	1.6
9 or More	5.8	5.7	22.1	179	46	175.5	51	2,050	.53	2,008	588	4.6
Ownership of Unit												
Owned	63.2	60.8	143.5	123	52	118.5	44	1,514	.64	1,457	537	1.4
Rented	33.4	15.7	37.7	161	67	75.2	31	2,033	.84	953	393	2.3
Public Housing	3.4	.8	2.9	263	69	58.2	27	3,396	.89	753	350	8.5
Not Public Housing	30.0	14.9	34.8	155	67	77.2	31	1,963	.84	976	397	2.5
Rent Subsidy	2.0	.7	2.2	214	70	75.8	33	2,552	.84	905	390	8.2
No Rent Subsidy	28.0	14.2	32.6	152	66	77.3	31	1,934	.84	981	397	2.6
Year of Construction												
1939 or Before	20.4	16.0	40.6	164	65	129.4	51	1,682	.66	1,325	525	2.7
1940 to 1949	6.9	5.9	11.6	132	67	111.8	45	1,463	.74	1,240	496	3.7
1950 to 1959	13.1	11.7	24.7	128	60	114.1	41	1,555	.73	1,387	495	3.6
1960 to 1969	15.0	11.3	27.2	136	57	102.9	43	1,665	.69	1,257	522	3.1
1970 to 1979	18.1	13.1	31.7	122	50	87.9	34	1,694	.70	1,222	472	2.9
1980 to 1984	8.5	6.5	14.7	105	46	80.3	30	1,632	.72	1,247	459	3.6
1985 to 1987	5.5	4.3	10.8	108	44	85.2	30	1,631	.66	1,284	459	4.8
1988 to 1990	4.7	4.0	10.0	106	43	90.4	31	1,544	.62	1,322	452	4.3
1991 to 1993 [3]	4.5	3.7	10.0	108	40	88.9	33	1,455	.53	1,200	448	6.0
All Utilities Paid by Household												
Yes	82.9	73.1	168.8	123	53	108.3	40	1,536	.67	1,356	503	1.3
No	13.8	3.3	12.4	309	83	75.2	36	3,453	.93	840	397	3.8
1993 Family Income												
Less than $5,000	4.1	2.3	4.6	139	71	79.8	35	1,724	.88	991	433	5.5
$5,000 to $9,999	10.6	6.9	12.9	125	67	81.4	43	1,502	.80	977	511	3.5
$10,000 to $14,999	11.1	7.8	16.0	128	62	89.7	38	1,502	.73	1,051	446	3.5
$15,000 to $19,999	9.6	7.5	15.4	128	62	99.2	41	1,498	.73	1,163	478	3.6
$20,000 to $24,999	8.7	6.8	14.4	125	59	96.6	41	1,526	.72	1,182	501	3.2
$25,000 to $34,999	14.1	11.5	26.4	127	55	103.5	39	1,592	.69	1,302	493	2.8
$35,000 to $49,999	17.5	14.6	37.5	130	51	108.5	38	1,648	.64	1,379	477	2.3
$50,000 to $74,999	12.6	11.5	29.9	131	50	119.2	38	1,638	.63	1,493	478	2.5
$75,000 or More	8.3	7.6	24.3	153	48	139.9	45	1,983	.62	1,809	588	3.7
Below Poverty Line												
100 Percent	14.4	9.3	17.7	133	70	85.8	31	1,631	.86	1,055	377	3.1
125 Percent	19.4	13.1	25.0	130	68	87.8	32	1,592	.83	1,078	388	2.6
150 Percent	24.8	16.9	32.8	129	67	88.6	32	1,595	.82	1,092	395	2.3
Eligible for Federal Assistance [4]	**30.7**	**21.1**	**42.5**	**132**	**65**	**90.7**	**35**	**1,595**	**.79**	**1,096**	**419**	**2.2**
Age of Householder												
Under 25 Years	5.7	3.0	6.4	143	67	75.4	30	1,810	.85	956	377	5.7
25 to 34 Years	19.9	14.0	31.8	136	60	95.4	32	1,690	.74	1,187	394	2.4
35 to 44 Years	21.4	18.0	42.8	126	53	105.9	32	1,640	.69	1,380	417	2.1
45 to 59 Years	21.9	18.8	46.5	132	53	113.5	43	1,663	.67	1,429	546	2.2
60 Years and Over	27.8	22.7	53.7	129	55	105.6	59	1,500	.63	1,227	681	2.1

See footnotes at end of table.

Table 5.1. Consumption and Expenditures in U.S. Households, 1993 (Continued)

Characteristics	Total Households (million)	Residential Buildings: Total Number (million)	Residential Buildings: Total Floorspace (billion sq. ft.)	Average of Major Energy Sources [1]: Consumption: per Building (million Btu)	Consumption: per Square Foot (thousand Btu)	Consumption: per Household (million Btu)	Consumption: per Household Member (million Btu)	Expenditures (dollars): per Building	Expenditures (dollars): per Square Foot	Expenditures (dollars): per Household	Expenditures (dollars): per Household Member	RSE Row Factors
RSE Column Factors:	1.4	1.4	1.4	1.0	0.8	1.0	1.0	0.9	0.8	0.8	0.8	
Education of Householder												
12 Years or Fewer	51.5	41.0	85.6	126	61	100.6	38	1,540	0.74	1,226	463	1.6
13 to 16 Years	33.6	26.6	69.1	133	51	105.0	40	1,681	.65	1,330	512	1.9
17 Years or More	11.5	8.9	26.5	146	49	112.4	45	1,808	.61	1,394	556	3.0
Race of Householder												
White	80.2	66.2	158.6	128	53	105.3	41	1,584	.66	1,307	513	1.4
Black	10.9	7.0	15.2	167	77	106.7	39	1,956	.90	1,250	461	4.0
Other [5]	5.5	3.3	7.4	121	55	72.7	22	1,642	.74	988	295	5.3
Householder of Hispanic Descent												
Yes	7.9	5.2	11.2	123	57	81.2	25	1,612	.75	1,065	332	4.5
No	88.7	71.3	170.1	131	55	105.5	41	1,621	.68	1,302	508	1.3
Household Size												
1 Person	23.5	14.8	32.1	122	56	76.7	77	1,437	.66	904	904	2.5
2 Persons	31.7	25.8	61.9	124	52	101.3	51	1,540	.64	1,253	626	1.8
3 Persons	16.6	13.9	32.3	135	58	112.9	38	1,693	.73	1,416	472	2.2
4 Persons	14.6	13.0	32.4	140	56	125.2	31	1,750	.70	1,561	390	2.0
5 Persons	6.8	6.1	15.0	136	55	122.3	24	1,770	.72	1,588	318	3.2
6 or More Persons	3.5	3.0	7.5	158	62	133.9	20	2,012	.79	1,708	251	6.7

[1] Major Energy Sources include: electricity, natural gas, fuel oil, kerosene, and liquefied petroleum gas.
[2] Climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[3] Does not include all new construction for 1993.
[4] Below 150 percent of poverty line or 60 percent of median State income.
[5] Includes 1.7 million householders who described themselves as Hispanic rather than White, Black, or other.

Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • See ''Glossary'' for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A-G of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.2. Total Consumption in U.S. Households, 1993

Characteristics	Major Energy Sources [1] (quadrillion Btu)	Electricity			Natural Gas		Fuel Oil		Kerosene		Liquefied Petroleum Gas		RSE Row Factors
		Primary	Site										
		(quadrillion Btu)	(quadrillion Btu)	(billion kWh)	(quadrillion Btu)	(billion cubic feet)	(quadrillion Btu)	(billion gallons)	(quadrillion Btu)	(billion gallons)	(quadrillion Btu)	(billion gallons)	
RSE Column Factors:	0.4	0.4	0.4	0.4	0.7	0.7	1.3	1.3	2.8	2.8	2.0	2.0	
Total U.S. Households	**10.01**	**9.89**	**3.28**	**962**	**5.27**	**5,131**	**1.02**	**7.38**	**0.05**	**0.34**	**0.38**	**4.16**	**4.8**
Census Region and Division													
Northeast	2.38	1.42	.47	138	1.11	1,081	.76	5.46	.02	.15	.03	.28	10.7
New England	.62	.37	.12	36	.19	184	.29	2.10	.01	.06	.01	.15	14.9
Middle Atlantic	1.76	1.05	.35	102	.92	897	.47	3.36	.01	.08	.01	.13	13.8
Midwest	3.13	2.23	.74	217	2.07	2,013	.13	.92	Q	Q	.19	2.04	10.0
East North Central	2.27	1.50	.50	146	1.59	1,549	.07	.51	Q	Q	.10	1.13	11.6
West North Central	.86	.74	.24	72	.48	463	.06	.41	Q	Q	.08	.91	16.8
South	2.95	4.54	1.51	442	1.18	1,149	.11	.77	.02	.15	.13	1.43	7.8
South Atlantic	1.35	2.25	.75	219	.42	409	.10	.72	.02	.13	.07	.73	9.3
East South Central	.57	.90	.30	88	.22	217	Q	Q	Q	Q	.04	.41	16.2
West South Central	1.02	1.39	.46	135	.54	523	NC	NC	Q	Q	.03	.29	13.7
West	1.55	1.70	.56	166	.91	888	.03	.23	Q	Q	.04	.41	10.6
Mountain	.53	.50	.17	49	.33	317	Q	Q	Q	Q	.03	.30	13.8
Pacific	1.02	1.20	.40	117	.59	571	.03	.19	Q	Q	.01	.11	12.7
Largest Populated States													
California	.73	.68	.22	66	.49	478	Q	Q	Q	Q	.01	.07	8.8
Florida	.29	.76	.25	74	.02	18	Q	Q	Q	Q	.01	.14	19.8
New York	.82	.40	.13	39	.42	411	.25	1.83	Q	Q	Q	Q	22.9
Texas	.61	.88	.29	86	.30	295	NC	NC	Q	Q	.02	.17	20.1
Urban Status													
Urban	7.82	7.33	2.43	713	4.47	4,351	.78	5.59	.02	.16	.12	1.32	5.9
Central City	2.99	2.51	.83	244	1.93	1,876	.20	1.45	.01	.05	.02	.17	9.1
Suburban	4.84	4.82	1.60	469	2.54	2,475	.57	4.14	.01	.11	.11	1.15	6.6
Rural	2.18	2.57	.85	250	.80	779	.25	1.79	.02	.18	.26	2.84	9.4
Climate Zone [2]													
Under 2,000 CDD and Over 7,000 HDD	1.08	.82	.27	80	.52	506	.20	1.48	.01	.08	.07	.77	25.1
5,500 to 7,000 HDD	3.42	2.38	.79	232	2.14	2,083	.37	2.64	.01	.08	.11	1.23	17.8
4,000 to 5,499 HDD	2.43	2.33	.77	226	1.16	1,133	.42	3.02	.01	.07	.07	.76	16.6
Under 4,000 HDD	1.40	1.64	.54	159	.75	733	.03	.21	.01	.08	.06	.67	22.4
2,000 CDD or More and Under 4,000 HDD	1.68	2.72	.90	265	.70	677	Q	Q	.01	.04	.07	.73	15.9
Type of Housing Unit													
Single-Family	7.92	7.77	2.58	756	4.17	4,060	.83	6.02	.03	.19	.30	3.31	5.8
Detached	7.21	7.04	2.34	685	3.77	3,666	.78	5.65	.03	.19	.30	3.27	6.2
Attached	.70	.73	.24	71	.41	394	.05	.37	(*)	.01	Q	Q	17.7
Mobile Home	.46	.64	.21	63	.14	132	.02	.13	.02	.13	.07	.79	17.0
Multifamily	1.63	1.48	.49	144	.97	939	.17	1.23	(*)	.02	.01	.06	12.3
2 to 4 Units	.80	.50	.17	49	.54	523	.09	.64	(*)	.01	(*)	.04	17.3
5 or More Units	.83	.97	.32	95	.43	416	.08	.59	Q	Q	Q	Q	13.4
Heated Floorspace (square feet)													
Fewer than 1,000	1.96	2.06	.68	200	1.02	992	.14	.99	.02	.18	.09	.99	7.3
1,000 to 1,999	4.05	4.29	1.43	418	2.11	2,056	.35	2.52	.02	.12	.14	1.56	6.9
2,000 to 2,999	2.44	2.23	.74	217	1.29	1,254	.32	2.34	(*)	.02	.08	.88	9.0
3,000 or More	1.57	1.31	.43	127	.85	828	.21	1.53	Q	Q	.07	.73	12.6
Total Number of Rooms (Excluding Bathrooms)													
1 or 2	.13	.13	.04	13	.07	69	.02	.13	Q	Q	Q	Q	23.4
3 to 5	3.77	4.00	1.33	389	1.92	1,866	.33	2.39	.03	.25	.16	1.76	6.5
6 to 8	5.08	4.91	1.63	478	2.71	2,634	.54	3.87	.01	.09	.19	2.09	7.3
9 or More	1.02	.85	.28	83	.58	561	.14	.99	(*)	(*)	.03	.30	15.6

See footnotes at end of table.

Table 5.2. Total Consumption in U.S. Households, 1993 (Continued)

Characteristics	Major Energy Sources [1] (quadrillion Btu)	Electricity			Natural Gas		Fuel Oil		Kerosene		Liquefied Petroleum Gas		RSE Row Factors
		Primary	Site										
		(quadrillion Btu)	(quadrillion Btu)	(billion kWh)	(quadrillion Btu)	(billion cubic feet)	(quadrillion Btu)	(billion gallons)	(quadrillion Btu)	(billion gallons)	(quadrillion Btu)	(billion gallons)	
RSE Column Factors:	0.4	0.4	0.4	0.4	0.7	0.7	1.3	1.3	2.8	2.8	2.0	2.0	
Ownership of Unit													
Owned	7.49	7.43	2.47	723	3.86	3,755	0.81	5.88	0.03	0.23	0.32	3.50	5.7
Rented	2.52	2.46	.82	240	1.41	1,376	.21	1.50	.01	.11	.06	.66	7.2
Public Housing	.20	.22	.07	21	.12	114	.01	.06	Q	Q	Q	Q	24.2
Not Public Housing	2.32	2.25	.75	218	1.30	1,261	.20	1.44	.01	.10	.06	.65	7.6
Rent Subsidy	.15	.12	.04	12	.09	89	.02	.12	Q	Q	Q	Q	20.4
No Rent Subsidy	2.16	2.12	.71	207	1.21	1,172	.18	1.32	.01	.10	.06	.62	8.1
Year of Construction													
1939 or Before	2.63	1.54	.51	150	1.55	1,507	.43	3.12	.01	.10	.13	1.39	9.3
1940 to 1949	.77	.61	.20	59	.44	424	.10	.74	(*)	.03	.03	.32	15.3
1950 to 1959	1.49	1.27	.42	123	.85	824	.19	1.37	(*)	.03	.03	.31	12.5
1960 to 1969	1.55	1.46	.49	142	.90	872	.11	.76	.01	.04	.05	.58	12.1
1970 to 1979	1.59	2.15	.71	209	.69	667	.12	.88	.01	.09	.06	.69	10.0
1980 to 1984	.68	1.06	.35	103	.29	278	.02	.15	(*)	.02	.02	.19	13.8
1985 to 1987	.47	.69	.23	67	.20	195	.02	.12	(*)	.01	.02	.23	16.9
1988 to 1990	.43	.62	.21	60	.18	173	.02	.14	Q	Q	.02	.21	18.2
1991 to 1993 [3]	.40	.50	.16	48	.20	190	.01	.10	Q	Q	.02	.25	22.4
All Utilities Paid by Household													
Yes	8.97	9.25	3.07	900	4.62	4,493	.88	6.33	.04	.32	.36	3.97	5.3
No	1.03	.64	.21	62	.66	638	.15	1.05	(*)	.02	.02	.19	12.4
1993 Family Income													
Less than $5,000	.32	.29	.10	28	.18	175	.03	.21	(*)	.02	.02	.17	18.9
$5,000 to $9,999	.86	.78	.26	76	.48	465	.08	.55	.01	.05	.04	.47	11.9
$10,000 to $14,999	1.00	.86	.29	84	.58	561	.09	.66	.01	.06	.04	.38	10.6
$15,000 to $19,999	.95	.89	.30	87	.52	508	.09	.63	.01	.08	.04	.43	13.0
$20,000 to $24,999	.84	.85	.28	83	.43	422	.08	.59	(*)	.03	.04	.46	11.9
$25,000 to $34,999	1.45	1.53	.51	149	.70	682	.16	1.16	.01	.04	.08	.84	10.4
$35,000 to $49,999	1.90	1.97	.65	191	.96	937	.21	1.51	(*)	.03	.07	.73	8.6
$50,000 to $74,999	1.51	1.56	.52	152	.78	755	.17	1.21	(*)	.01	.04	.47	9.9
$75,000 or More	1.17	1.15	.38	112	.64	626	.12	.86	Q	Q	.02	.21	14.5
Below Poverty Line													
100 Percent	1.23	1.15	.38	112	.68	666	.09	.68	.01	.09	.06	.66	10.5
125 Percent	1.70	1.60	.53	156	.93	902	.14	1.00	.02	.12	.09	.96	9.5
150 Percent	2.19	2.12	.70	207	1.19	1,156	.18	1.31	.02	.14	.10	1.12	8.6
Eligible for Federal Assistance [4]	**2.78**	**2.56**	**.85**	**249**	**1.54**	**1,498**	**.25**	**1.83**	**.02**	**.18**	**.12**	**1.28**	**7.7**
Age of Householder													
Under 25 Years	.43	.47	.16	46	.24	231	.02	.17	(*)	.02	.01	.12	17.5
25 to 34 Years	1.90	1.91	.63	186	1.05	1,025	.14	1.01	.01	.07	.06	.66	9.1
35 to 44 Years	2.27	2.46	.82	239	1.15	1,121	.21	1.52	.01	.09	.07	.81	7.9
45 to 59 Years	2.48	2.57	.85	250	1.25	1,213	.26	1.89	.01	.07	.11	1.18	8.2
60 Years and Over	2.93	2.48	.82	241	1.58	1,541	.39	2.79	.01	.09	.13	1.40	8.6
Education of Householder													
12 Years or Fewer	5.18	5.02	1.67	488	2.69	2,620	.53	3.79	.03	.26	.26	2.87	6.0
13 to 16 Years	3.53	3.66	1.21	356	1.85	1,795	.36	2.60	.01	.07	.10	1.10	6.7
17 Years or More	1.29	1.21	.40	118	.74	715	.14	.99	Q	Q	.02	.19	11.9
Race of Householder													
White	8.44	8.55	2.84	832	4.28	4,159	.93	6.68	.04	.27	.36	3.97	5.5
Black	1.16	.94	.31	91	.76	740	.07	.50	.01	.06	.01	.15	14.4
Other [5]	.40	.40	.13	39	.24	231	.03	.20	Q	Q	(*)	.04	17.0

See footnotes at end of table.

Table 5.2. Total Consumption in U.S. Households, 1993 (Continued)

Characteristics	Major Energy Sources [1] (quadrillion Btu)	Electricity			Natural Gas		Fuel Oil		Kerosene		Liquefied Petroleum Gas		RSE Row Factors
		Primary	Site										
		(quadrillion Btu)	(quadrillion Btu)	(billion kWh)	(quadrillion Btu)	(billion cubic feet)	(quadrillion Btu)	(billion gallons)	(quadrillion Btu)	(billion gallons)	(quadrillion Btu)	(billion gallons)	
RSE Column Factors:	0.4	0.4	0.4	0.4	0.7	0.7	1.3	1.3	2.8	2.8	2.0	2.0	
Householder of Hispanic Descent													
Yes	0.64	0.61	0.20	59	0.35	342	0.07	0.53	Q	Q	0.01	0.13	16.1
No	9.37	9.28	3.08	903	4.92	4,788	.95	6.85	0.04	0.33	.37	4.03	5.2
Household Size													
1 Person	1.80	1.56	.52	152	1.02	989	.20	1.43	.01	.08	.06	.66	8.0
2 Persons	3.21	3.25	1.08	316	1.64	1,592	.33	2.41	.01	.10	.14	1.58	7.8
3 Persons	1.87	1.85	.61	180	.98	958	.20	1.45	.01	.07	.06	.71	8.9
4 Persons	1.83	1.85	.61	180	.98	958	.17	1.21	.01	.04	.06	.62	8.0
5 Persons	.83	.91	.30	89	.40	391	.08	.55	.01	.04	.04	.45	12.9
6 or More Persons	.47	.47	.16	46	.25	243	.05	.33	Q	Q	.01	.14	16.9

[1] Major Energy Sources include: electricity, natural gas, fuel oil, kerosene, and liquefied petroleum gas.
[2] Climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[3] Does not include all new construction for 1993.
[4] Below 150 percent of poverty line or 60 percent of median State income.
[5] Includes some householders who described themselves as Hispanic rather than White, Black, or other.
(*) = Value rounds to zero in the units displayed.
NC = No cases in sample.
Q = Data withheld either because the Relative Standard Error (RSE) was greater than 50 percent or fewer than 10 households were sampled.
Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Site electricity is the amount of electricity delivered to households. Primary electricity, which is not included in the ''Major Energy Sources'' category, is site electricity plus the conversion losses in the electric generation process at the utility plant. • Because of rounding, data may not sum to totals. • See ''Glossary'' for definition of terms used in this report.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A-G of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.3. Total Expenditures in U.S. Households, 1993

(Billion Dollars)

Characteristics	Major Energy Sources [1]	Electricity	Natural Gas	Fuel Oil	Kerosene	Liquefied Petroleum Gas	RSE Row Factors
RSE Column Factors:	0.4	0.4	0.7	1.4	3.0	2.0	
Total U.S. Households	**123.91**	**81.08**	**32.04**	**6.61**	**0.37**	**3.81**	**4.6**
Census Region and Division							
Northeast	29.72	15.76	8.60	4.85	.15	.35	9.5
New England	7.77	4.04	1.59	1.89	.07	.17	13.7
Middle Atlantic	21.95	11.72	7.00	2.96	.09	.18	12.3
Midwest	31.12	17.55	11.13	.79	.05	1.59	10.1
East North Central	22.21	12.21	8.62	.44	Q	.90	11.3
West North Central	8.91	5.34	2.52	.34	Q	.70	14.2
South	43.67	34.08	7.24	.73	.17	1.46	7.7
South Atlantic	22.37	17.70	3.01	.69	.14	.83	10.4
East South Central	7.20	5.50	1.26	Q	Q	.38	13.8
West South Central	14.09	10.88	2.97	NC	Q	.24	12.6
West	19.41	13.69	5.07	.24	Q	.41	9.1
Mountain	5.49	3.63	1.57	Q	Q	.26	10.4
Pacific	13.91	10.06	3.50	.20	Q	.15	11.5
Largest Populated States							
California	10.50	7.39	2.99	Q	Q	.10	9.1
Florida	6.58	6.16	.16	Q	Q	.20	18.6
New York	10.73	5.43	3.54	1.59	.06	.11	19.7
Texas	8.70	6.88	1.68	NC	Q	.14	20.3
Urban Status							
Urban	96.61	62.50	27.59	5.03	.18	1.32	5.5
Central City	35.34	21.65	12.25	1.19	.06	.19	8.0
Suburban	61.27	40.85	15.34	3.83	.12	1.13	6.3
Rural	27.30	18.58	4.44	1.58	.19	2.50	9.1
Climate Zone [2]							
Under 2,000 CDD and Over 7,000 HDD	10.90	6.06	2.80	1.29	.08	.67	24.9
5,500 to 7,000 HDD	35.93	19.91	12.52	2.39	.09	1.03	16.9
4,000 to 5,499 HDD	30.51	19.10	7.94	2.71	.07	.69	15.2
Under 4,000 HDD	19.70	14.09	4.67	.19	.09	.68	20.5
2,000 CDD or More and Under 4,000 HDD	26.87	21.92	4.10	Q	.05	.76	14.6
Type of Housing Unit							
Single-Family	96.27	62.66	24.87	5.54	.22	2.99	5.7
Detached	87.02	56.44	22.23	5.20	.21	2.95	5.9
Attached	9.25	6.22	2.65	.34	.01	Q	16.3
Mobile Home	6.71	4.93	.76	.12	.14	.76	16.5
Multifamily	20.93	13.48	6.40	.95	.02	.07	11.7
2 to 4 Units	8.92	4.72	3.56	.58	.01	.04	16.0
5 or More Units	12.01	8.76	2.84	.37	Q	Q	12.2
Heated Floorspace (square feet)							
Fewer than 1,000	25.65	17.20	6.48	.79	.20	.98	7.0
1,000 to 1,999	51.68	34.97	12.84	2.28	.13	1.45	6.8
2,000 to 2,999	28.93	18.23	7.74	2.14	.02	.80	8.9
3,000 or More	17.66	10.68	4.97	1.40	Q	.59	12.2
Total Number of Rooms (Excluding Bathrooms)							
1 or 2	1.84	1.21	.51	.10	Q	Q	21.0
3 to 5	48.88	33.01	11.89	2.03	.27	1.68	6.3
6 to 8	61.46	39.73	16.21	3.56	.10	1.86	7.1
9 or More	11.73	7.13	3.42	.91	.01	.27	15.7
Ownership of Unit							
Owned	92.07	60.10	23.15	5.40	.26	3.16	5.4
Rented	31.84	20.98	8.88	1.21	.12	.65	7.0
Public Housing	2.59	1.80	.74	.04	Q	Q	22.8
Not Public Housing	29.25	19.19	8.14	1.17	.11	.64	7.5
Rent Subsidy	1.80	1.08	.61	.09	Q	Q	20.7
No Rent Subsidy	27.45	18.11	7.54	1.08	.11	.62	7.9

See footnotes at end of table.

Table 5.3. Total Expenditures in U.S. Households, 1993 (Continued)

(Billion Dollars)

Characteristics	Major Energy Sources [1]	Electricity	Natural Gas	Fuel Oil	Kerosene	Liquefied Petroleum Gas	RSE Row Factors
RSE Column Factors:	0.4	0.4	0.7	1.4	3.0	2.0	
Year of Construction							
1939 or Before	26.97	13.34	9.60	2.75	0.11	1.18	9.1
1940 to 1949	8.56	4.91	2.70	.64	.03	.29	14.8
1950 to 1959	18.12	11.22	5.28	1.28	.03	.30	13.6
1960 to 1969	18.89	12.26	5.35	.69	.04	.55	11.9
1970 to 1979	22.18	16.74	3.92	.78	.09	.64	9.7
1980 to 1984	10.55	8.48	1.73	.13	.03	.18	13.3
1985 to 1987	7.05	5.47	1.22	.11	.01	.23	16.8
1988 to 1990	6.23	4.81	1.05	.13	Q	.22	17.6
1991 to 1993 [3]	5.36	3.85	1.19	.09	Q	.23	22.0
All Utilities Paid by Household							
Yes	112.36	74.75	27.81	5.82	.35	3.64	5.1
No	11.55	6.33	4.23	.79	.03	.18	11.2
1993 Family Income							
Less than $5,000	4.02	2.52	1.14	.18	.02	.16	17.9
$5,000 to $9,999	10.34	6.42	2.94	.47	.06	.45	11.2
$10,000 to $14,999	11.69	7.17	3.51	.58	.06	.37	10.2
$15,000 to $19,999	11.20	7.08	3.08	.55	.09	.40	12.5
$20,000 to $24,999	10.34	6.75	2.62	.51	.03	.42	11.8
$25,000 to $34,999	18.29	12.24	4.20	1.05	.05	.76	10.4
$35,000 to $49,999	24.07	16.18	5.87	1.36	.03	.64	8.1
$50,000 to $74,999	18.85	12.66	4.66	1.11	.02	.41	9.2
$75,000 or More	15.10	10.06	4.02	.81	Q	.20	14.7
Below Poverty Line							
100 Percent	15.18	9.61	4.26	.57	.09	.64	9.9
125 Percent	20.88	13.26	5.75	.84	.13	.91	8.9
150 Percent	27.03	17.39	7.32	1.11	.15	1.07	8.2
Eligible for Federal Assistance [4]	**33.62**	**21.15**	**9.48**	**1.57**	**.19**	**1.23**	**7.5**
Age of Householder							
Under 25 Years	5.46	3.77	1.41	.15	.02	.11	17.2
25 to 34 Years	23.64	15.68	6.39	.87	.08	.62	8.8
35 to 44 Years	29.51	20.17	7.09	1.37	.10	.78	7.6
45 to 59 Years	31.22	20.86	7.51	1.71	.08	1.06	8.0
60 Years and Over	34.09	20.59	9.64	2.51	.09	1.25	8.3
Education of Householder							
12 Years or Fewer	63.15	40.63	16.30	3.32	.28	2.63	5.7
13 to 16 Years	44.70	30.08	11.17	2.37	.07	1.01	6.4
17 Years or More	16.06	10.37	4.57	.92	Q	.17	11.5
Race of Householder							
White	104.81	69.20	25.69	6.02	.29	3.60	5.0
Black	13.63	8.17	4.79	.43	.07	.16	14.5
Other [5]	5.47	3.71	1.55	.16	Q	.05	16.6
Householder of Hispanic Descent							
Yes	8.41	5.56	2.28	.42	Q	.14	15.3
No	115.50	75.51	29.76	6.19	.36	3.67	5.0

See footnotes at end of table.

Table 5.3. Total Expenditures in U.S. Households, 1993 (Continued)

(Billion Dollars)

Characteristics	Major Energy Sources [1]	Electricity	Natural Gas	Fuel Oil	Kerosene	Liquefied Petroleum Gas	
RSE Column Factors:	0.4	0.4	0.7	1.4	3.0	2.0	RSE Row Factors
Household Size							
1 Person	21.26	13.11	6.18	1.29	0.08	0.60	7.4
2 Persons	39.71	26.15	9.85	2.15	.12	1.45	7.2
3 Persons	23.47	15.30	6.12	1.31	.08	.66	8.7
4 Persons	22.78	15.12	5.94	1.09	.05	.58	7.8
5 Persons	10.74	7.40	2.42	.48	.05	.40	12.6
6 or More Persons	5.94	3.99	1.52	.29	Q	.13	18.1

[1] Major Energy Sources include: electricity, natural gas, fuel oil, kerosene, and liquefied petroleum gas.
[2] Climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[3] Does not include all new construction for 1993.
[4] Below 150 percent of poverty line or 60 percent of median State income.
[5] Includes some householders who described themselves as Hispanic rather than White, Black, or other.

NC = No cases in sample.

Q = Data withheld either because the Relative Standard Error (RSE) was greater than 50 percent or fewer than 10 households were sampled.

Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • See ''Glossary'' for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A-G of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.4. Electricity Consumption and Expenditures in U.S. Households, 1993

Characteristics	Households Using Electricity (million)	Average per Household						RSE Row Factors
		Consumption			Expenditures (dollars)	Floorspace (square feet)	Expenditures (cents per kWh)	
		Primary	Site					
		(million Btu)	(million Btu)	(kWh)				
RSE Column Factors:	1.4	1.1	1.1	1.1	1.0	0.8	0.6	
Total U.S. Households	**96.6**	**102.4**	**34.0**	**9,965**	**840**	**1,876**	**8.4**	**1.5**
Census Region and Division								
Northeast	19.5	72.7	24.1	7,071	809	2,056	11.4	3.9
New England	5.1	72.5	24.1	7,049	797	2,101	11.3	3.7
Middle Atlantic	14.4	72.8	24.2	7,078	814	2,041	11.5	5.0
Midwest	23.3	95.9	31.8	9,327	753	2,170	8.1	3.8
East North Central	16.4	91.6	30.4	8,906	747	2,160	8.4	4.7
West North Central	6.9	106.1	35.2	10,319	769	2,194	7.5	5.5
South	33.4	135.8	45.1	13,212	1,019	1,707	7.7	2.2
South Atlantic	17.3	130.0	43.1	12,642	1,023	1,724	8.1	2.5
East South Central	6.0	150.8	50.0	14,666	917	1,796	6.2	4.5
West South Central	10.1	137.0	45.5	13,323	1,074	1,626	8.1	5.2
West	20.4	83.6	27.7	8,131	672	1,644	8.3	3.0
Mountain	5.4	93.9	31.2	9,130	677	1,730	7.4	5.8
Pacific	15.0	79.9	26.5	7,775	671	1,613	8.6	3.6
Largest Populated States								
California	11.1	60.9	20.2	5,924	664	1,609	11.2	3.3
Florida	5.6	136.6	45.3	13,287	1,107	1,667	8.3	4.4
New York	6.8	59.2	19.7	5,763	799	1,888	13.9	8.9
Texas	6.4	136.6	45.3	13,289	1,067	1,668	8.0	6.5
Urban Status								
Urban	75.8	96.7	32.1	9,407	825	1,854	8.8	1.8
Central City	30.6	82.1	27.2	7,986	708	1,540	8.9	2.4
Suburban	45.2	106.6	35.4	10,368	904	2,067	8.7	1.6
Rural	20.8	123.4	40.9	12,000	894	1,954	7.4	2.8
Climate Zone [1]								
Under 2,000 CDD and Over 7,000 HDD	8.7	94.7	31.4	9,209	697	2,218	7.6	4.8
5,500 to 7,000 HDD	26.5	90.0	29.9	8,758	752	2,085	8.6	4.7
4,000 to 5,499 HDD	22.4	103.8	34.4	10,096	852	1,963	8.4	3.2
Under 4,000 HDD	17.8	92.1	30.6	8,954	792	1,603	8.8	4.8
2,000 CDD or More and Under 4,000 HDD	21.2	128.4	42.6	12,495	1,035	1,612	8.3	3.2
Type of Housing Unit								
Single-Family	66.7	116.5	38.7	11,328	939	2,279	8.3	1.5
Detached	59.4	118.5	39.3	11,528	950	2,338	8.2	1.5
Attached	7.3	99.8	33.1	9,704	852	1,799	8.8	5.1
Mobile Home	5.6	115.6	38.4	11,241	884	975	7.9	4.3
Multifamily	24.2	60.9	20.2	5,919	556	972	9.4	2.8
2 to 4 Units	8.0	62.8	20.8	6,105	588	1,198	9.6	4.4
5 or More Units	16.2	59.9	19.9	5,827	540	861	9.3	3.6
Heated Floorspace (square feet)								
Fewer than 1,000	29.3	70.3	23.3	6,835	587	826	8.6	1.9
1,000 to 1,999	40.2	106.9	35.5	10,402	871	1,697	8.4	1.9
2,000 to 2,999	17.8	125.1	41.5	12,165	1,022	2,722	8.4	2.2
3,000 or More	9.3	141.0	46.8	13,717	1,150	4,335	8.4	3.1
Total Number of Rooms (Excluding Bathrooms)								
1 or 2	3.2	40.6	13.5	3,947	377	531	9.6	6.9
3 to 5	47.3	84.4	28.0	8,213	698	1,259	8.5	1.8
6 to 8	40.2	122.3	40.6	11,895	988	2,431	8.3	1.7
9 or More	5.8	145.8	48.4	14,187	1,220	3,791	8.6	4.2

See footnotes at end of table.

Table 5.4. Electricity Consumption and Expenditures in U.S. Households, 1993 (Continued)

Characteristics	Households Using Electricity (million)	Average per Household						RSE Row Factors
		Consumption			Expenditures (dollars)	Floorspace (square feet)	Expenditures (cents per kWh)	
		Primary	Site					
		(million Btu)	(million Btu)	(kWh)				
RSE Column Factors:	1.4	1.1	1.1	1.1	1.0	0.8	0.6	
Ownership of Unit								
Owned	63.2	117.6	39.0	11,443	951	2,272	8.3	1.4
Rented	33.4	73.7	24.5	7,170	628	1,127	8.8	2.1
Public Housing	3.4	63.0	20.9	6,133	523	842	8.5	7.0
Not Public Housing	30.0	74.9	24.9	7,289	640	1,160	8.8	2.2
Rent Subsidy	2.0	60.7	20.2	5,908	541	1,082	9.2	7.1
No Rent Subsidy	28.0	75.9	25.2	7,387	647	1,166	8.8	2.3
Year of Construction								
1939 or Before	20.3	76.0	25.2	7,396	657	1,995	8.9	2.8
1940 to 1949	6.9	88.0	29.2	8,564	712	1,676	8.3	4.1
1950 to 1959	13.1	97.1	32.2	9,447	859	1,890	9.1	3.0
1960 to 1969	15.0	97.5	32.3	9,480	816	1,811	8.6	3.1
1970 to 1979	18.1	118.3	39.3	11,509	923	1,746	8.0	2.8
1980 to 1984	8.5	125.4	41.6	12,203	1,002	1,740	8.2	3.4
1985 to 1987	5.5	124.9	41.4	12,146	997	1,959	8.2	3.8
1988 to 1990	4.7	131.2	43.5	12,759	1,020	2,118	8.0	3.7
1991 to 1993 [2]	4.5	111.1	36.9	10,805	861	2,244	8.0	5.5
All Electricity Paid by Household								
Yes	90.3	105.6	35.1	10,275	865	1,946	8.4	1.5
No	6.3	56.6	18.8	5,503	480	869	8.7	6.0
1993 Family Income								
Less than $5,000	4.0	72.4	24.0	7,044	622	1,124	8.8	5.2
$5,000 to $9,999	10.6	73.9	24.5	7,187	608	1,218	8.5	3.5
$10,000 to $14,999	11.1	77.4	25.7	7,531	645	1,437	8.6	2.9
$15,000 to $19,999	9.6	92.6	30.7	9,006	736	1,596	8.2	3.1
$20,000 to $24,999	8.7	97.5	32.3	9,480	772	1,644	8.1	3.3
$25,000 to $34,999	14.1	109.1	36.2	10,611	871	1,879	8.2	2.3
$35,000 to $49,999	17.4	112.8	37.5	10,976	928	2,146	8.5	2.4
$50,000 to $74,999	12.6	123.5	41.0	12,016	1,002	2,368	8.3	2.5
$75,000 or More	8.3	138.3	45.9	13,449	1,205	2,911	9.0	3.6
Below Poverty Line								
100 Percent	14.4	80.1	26.6	7,793	669	1,228	8.6	3.1
125 Percent	19.4	82.8	27.5	8,056	685	1,293	8.5	2.8
150 Percent	24.7	86.0	28.5	8,366	704	1,326	8.4	2.5
Eligible for Federal Assistance [3]	**30.6**	**83.5**	**27.7**	**8,122**	**691**	**1,388**	**8.5**	**2.1**
Age of Householder								
Under 25 Years	5.7	82.3	27.3	8,010	660	1,129	8.2	4.6
25 to 34 Years	19.9	96.0	31.9	9,340	788	1,596	8.4	2.2
35 to 44 Years	21.4	115.2	38.2	11,201	944	2,002	8.4	1.9
45 to 59 Years	21.9	117.7	39.1	11,450	955	2,127	8.3	2.2
60 Years and Over	27.7	89.4	29.7	8,693	742	1,936	8.5	2.1
Education of Householder								
12 Years or Fewer	51.5	97.6	32.4	9,491	790	1,662	8.3	1.7
13 to 16 Years	33.6	108.9	36.2	10,596	895	2,057	8.4	1.8
17 Years or More	11.5	105.3	34.9	10,241	901	2,303	8.8	3.0
Race of Householder								
White	80.1	106.7	35.4	10,383	863	1,979	8.3	1.6
Black	10.9	86.1	28.6	8,374	750	1,395	9.0	3.2
Other [5]	5.5	72.3	24.0	7,036	670	1,333	9.5	4.7

See footnotes at end of table.

Table 5.4. Electricity Consumption and Expenditures in U.S. Households, 1993 (Continued)

Characteristics	Households Using Electricity (million)	Average per Household						RSE Row Factors
		Consumption			Expenditures (dollars)	Floorspace (square feet)	Expenditures (cents per kWh)	
		Primary	Site					
		(million Btu)	(million Btu)	(kWh)				
RSE Column Factors:	1.4	1.1	1.1	1.1	1.0	0.8	0.6	
Householder of Hispanic Descent								
Yes	7.9	77.1	25.6	7,497	704	1,412	9.4	3.8
No	88.7	104.7	34.8	10,185	852	1,917	8.4	1.5
Household Size								
1 Person	23.5	66.6	22.1	6,476	559	1,367	8.6	2.6
2 Persons	31.7	102.6	34.1	9,982	825	1,954	8.3	1.9
3 Persons	16.6	111.4	37.0	10,838	923	1,950	8.5	2.2
4 Persons	14.6	126.6	42.0	12,311	1,036	2,220	8.4	2.1
5 Persons	6.8	134.8	44.7	13,110	1,094	2,213	8.3	3.0
6 or More Persons	3.5	136.3	45.2	13,258	1,154	2,152	8.7	6.1

[1] Climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[2] Does not include all new construction for 1993.
[3] Below 150 percent of poverty line or 60 percent of median State income.
[5] Includes some householders who described themselves as Hispanic rather than White, Black, or other.

Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Site electricity is the amount of electricity delivered to households. Primary electricity is site electricity plus the conversion losses in the electric generation process at the utility plant. • Because of rounding, data may not sum to totals. • See ''Glossary'' for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A, B, C, and E of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.5. Natural Gas Consumption and Expenditures in U.S. Households, 1993

Characteristics	Households Using Natural Gas (million)	Average per Household				Expenditures (dollars per thousand cf)	RSE Row Factors
		Consumption		Expenditures (dollars)	Floorspace (square feet)		
		(million Btu)	(thousand cf)				
RSE Column Factors:	1.8	1.0	1.0	1.0	0.9	0.5	
Total U.S. Households	**58.7**	**89.9**	**87.5**	**546**	**1,908**	**6.2**	**1.7**
Census Region and Division							
Northeast	12.2	90.9	88.4	703	1,906	8.0	3.8
New England	2.2	85.7	83.4	722	1,903	8.7	5.8
Middle Atlantic	10.0	92.0	89.5	699	1,906	7.8	4.4
Midwest	17.5	118.4	115.1	637	2,152	5.5	2.1
East North Central	13.3	119.3	116.1	646	2,114	5.6	2.2
West North Central	4.1	115.2	112.0	609	2,274	5.4	5.1
South	14.7	80.1	77.9	491	1,796	6.3	3.7
South Atlantic	5.4	78.0	75.8	557	1,836	7.3	4.5
East South Central	2.4	92.8	90.2	524	2,064	5.8	9.1
West South Central	6.9	77.4	75.3	428	1,671	5.7	5.8
West	14.2	64.3	62.5	357	1,726	5.7	2.9
Mountain	3.7	89.1	86.7	429	1,805	4.9	5.1
Pacific	10.5	55.7	54.2	332	1,699	6.1	3.1
Largest Populated States							
California	9.6	51.0	49.6	311	1,635	6.3	3.2
Florida	.5	38.0	37.0	322	1,692	8.7	12.4
New York	5.2	80.9	78.7	677	1,759	8.6	8.3
Texas	4.2	72.1	70.1	400	1,713	5.7	9.0
Urban Status							
Urban	50.8	88.0	85.6	543	1,877	6.3	1.8
Central City	22.8	84.6	82.3	537	1,599	6.5	2.9
Suburban	28.0	90.7	88.3	547	2,104	6.2	2.2
Rural	7.8	102.6	99.8	569	2,106	5.7	4.6
Climate Zone [1]							
Under 2,000 CDD and Over 7,000 HDD	4.5	115.0	111.9	620	2,292	5.5	5.1
5,500 to 7,000 HDD	18.8	114.1	111.0	667	2,070	6.0	2.7
4,000 to 5,499 HDD	13.0	89.9	87.5	613	1,967	7.0	4.9
Under 4,000 HDD	12.2	61.9	60.3	384	1,685	6.4	4.8
2,000 CDD or More and Under 4,000 HDD	10.3	67.8	65.9	400	1,634	6.1	4.7
Type of Housing Unit							
Single-Family	41.4	100.8	98.1	601	2,295	6.1	1.7
Detached	36.7	102.8	100.0	606	2,345	6.1	1.8
Attached	4.7	85.4	83.1	558	1,901	6.7	4.5
Mobile Home	1.8	73.3	71.3	411	996	5.8	5.7
Multifamily	15.4	62.7	60.9	416	978	6.8	3.4
2 to 4 Units	5.6	96.4	93.8	639	1,241	6.8	4.6
5 or More Units	9.8	43.5	42.3	289	829	6.8	3.7
Heated Floorspace (square feet)							
Fewer than 1,000	17.1	59.7	58.1	379	816	6.5	2.5
1,000 to 1,999	24.5	86.1	83.7	523	1,704	6.2	2.1
2,000 to 2,999	11.1	116.4	113.3	699	2,704	6.2	2.6
3,000 or More	5.9	143.2	139.3	836	4,404	6.0	3.3
Total Number of Rooms (Excluding Bathrooms)							
1 or 2	2.1	33.1	32.2	240	520	7.4	5.6
3 to 5	27.1	70.8	68.8	439	1,248	6.4	2.4
6 to 8	25.4	106.7	103.8	639	2,420	6.2	1.9
9 or More	4.0	143.2	139.3	848	3,861	6.1	4.3

See footnotes at end of table.

Table 5.5. Natural Gas Consumption and Expenditures in U.S. Households, 1993 (Continued)

Characteristics	Households Using Natural Gas (million)	Average per Household					RSE Row Factors
		Consumption		Expenditures (dollars)	Floorspace (square feet)	Expenditures (dollars per thousand cf)	
		(million Btu)	(thousand cf)				
RSE Column Factors:	1.8	1.0	1.0	1.0	0.9	0.5	
Ownership of Unit							
Owned	37.7	102.3	99.5	614	2,327	6.2	1.8
Rented	20.9	67.6	65.7	424	1,152	6.5	2.7
Public Housing	2.0	58.5	56.9	367	871	6.4	7.3
Not Public Housing	18.9	68.5	66.7	431	1,182	6.5	2.9
Rent Subsidy	1.4	63.5	61.8	422	1,094	6.8	8.7
No Rent Subsidy	17.5	68.9	67.1	431	1,190	6.4	3.0
Year of Construction							
1939 or Before	14.8	105.0	102.1	650	1,938	6.4	3.1
1940 to 1949	4.9	88.8	86.4	549	1,637	6.4	4.2
1950 to 1959	9.4	90.4	87.9	563	1,872	6.4	3.5
1960 to 1969	9.9	90.5	88.1	541	1,834	6.1	3.7
1970 to 1979	8.6	79.5	77.3	455	1,817	5.9	3.8
1980 to 1984	4.0	72.1	70.1	435	1,842	6.2	4.7
1985 to 1987	2.6	75.8	73.8	463	2,131	6.3	6.0
1988 to 1990	2.1	84.6	82.3	499	2,499	6.1	5.5
1991 to 1993 [2]	2.4	82.5	80.2	502	2,396	6.3	7.9
All Gas Paid by Household							
Yes	48.2	95.6	93.0	578	2,124	6.2	1.8
No	10.5	63.8	62.0	400	912	6.4	4.3
1993 Family Income							
Less than $5,000	2.4	73.8	71.8	469	1,176	6.5	5.4
$5,000 to $9,999	6.5	74.0	72.0	455	1,269	6.3	3.8
$10,000 to $14,999	7.1	81.5	79.3	495	1,459	6.2	4.0
$15,000 to $19,999	5.8	90.7	88.2	535	1,654	6.1	4.1
$20,000 to $24,999	5.1	85.8	83.4	519	1,646	6.2	3.8
$25,000 to $34,999	7.8	90.2	87.8	541	1,853	6.2	3.1
$35,000 to $49,999	10.4	92.3	89.8	562	2,162	6.3	2.6
$50,000 to $74,999	8.0	97.1	94.5	583	2,339	6.2	3.0
$75,000 or More	5.7	113.6	110.5	708	3,004	6.4	4.5
Below Poverty Line							
100 Percent	8.9	77.3	75.2	481	1,283	6.4	3.8
125 Percent	11.8	78.8	76.6	488	1,328	6.4	3.6
150 Percent	14.9	79.7	77.5	491	1,352	6.3	3.1
Eligible for Federal Assistance [3]	**18.7**	**82.3**	**80.1**	**506**	**1,416**	**6.3**	**2.7**
Age of Householder							
Under 25 Years	3.2	75.2	73.1	447	1,267	6.1	6.0
25 to 34 Years	12.6	83.6	81.3	507	1,651	6.2	2.7
35 to 44 Years	13.0	88.5	86.1	545	2,028	6.3	2.6
45 to 59 Years	13.0	96.2	93.6	580	2,171	6.2	2.5
60 Years and Over	16.9	93.6	91.1	569	1,926	6.3	2.6
Education of Householder							
12 Years or Fewer	30.7	87.7	85.3	531	1,663	6.2	2.2
13 to 16 Years	20.2	91.4	88.9	553	2,109	6.2	2.4
17 Years or More	7.8	94.8	92.2	589	2,357	6.4	3.3
Race of Householder							
White	47.0	91.0	88.5	547	2,017	6.2	2.0
Black	7.7	98.9	96.2	622	1,506	6.5	3.9
Other [4]	4.0	59.8	58.1	391	1,394	6.7	5.1

See footnotes at end of table.

Table 5.5. Natural Gas Consumption and Expenditures in U.S. Households, 1993 (Continued)

Characteristics	Households Using Natural Gas (million)	Average per Household				Expenditures (dollars per thousand cf)	RSE Row Factors
		Consumption		Expenditures (dollars)	Floorspace (square feet)		
		(million Btu)	(thousand cf)				
RSE Column Factors:	1.8	1.0	1.0	1.0	0.9	0.5	
Householder of Hispanic Descent							
Yes	5.8	61.2	59.5	395	1,359	6.6	4.8
No	52.9	93.1	90.5	563	1,968	6.2	1.7
Household Size							
1 Person	14.2	71.8	69.9	437	1,370	6.2	2.8
2 Persons	18.4	88.9	86.5	535	1,984	6.2	2.3
3 Persons	10.3	95.1	92.5	592	1,982	6.4	2.9
4 Persons	9.4	104.7	101.8	632	2,273	6.2	2.9
5 Persons	4.1	98.9	96.2	595	2,304	6.2	3.3
6 or More Persons	2.3	109.5	106.5	667	2,086	6.3	7.8

[1] Climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[2] Does not include all new construction for 1993.
[3] Below 150 percent of poverty line or 60 percent of median State income.
[4] Includes some householders who described themselves as Hispanic rather than White, Black, or other.
Q = Data withheld either because the Relative Standard Error (RSE) was greater than 50 percent or fewer than 10 households were sampled.
Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • See ''Glossary'' for definition of terms used in this report.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A, B, C, and F of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.6. Fuel Oil Consumption and Expenditures in U.S. Households, 1993

Characteristics	Households Using Fuel Oil (million)	Average per Household				Expenditures (dollars per gallon)	RSE Row Factors
		Consumption		Expenditures (dollars)	Floorspace (square feet)		
		(million Btu)	(gallons)				
RSE Column Factors:	2.1	1.2	1.2	1.3	0.9	0.3	
Total U.S. Households	**10.8**	**94.7**	**684**	**612**	**2,262**	**0.90**	**3.3**
Census Region and Division							
Northeast	7.4	102.6	740	658	2,218	.89	4.2
New England	2.6	110.1	794	716	2,387	.90	5.7
Middle Atlantic	4.7	98.4	710	625	2,124	.88	5.4
Midwest	1.4	91.6	664	570	2,663	.86	4.7
East North Central	.7	94.3	682	592	2,675	.87	7.7
West North Central	.6	88.4	642	544	2,648	.85	6.0
South	1.6	67.3	486	464	2,075	.95	6.7
South Atlantic	1.5	67.5	487	465	2,103	.96	7.0
East South Central	Q	Q	Q	Q	Q	Q	NF
West South Central	NC	NC	NC	NC	NC	NC	NC
West	.5	71.7	518	520	2,418	1.00	21.7
Mountain	Q	Q	Q	Q	Q	Q	NF
Pacific	Q	69.9	504	511	2,446	1.01	26.9
Largest Populated States							
California	Q	Q	Q	Q	Q	Q	NF
Florida	Q	Q	Q	Q	Q	Q	NF
New York	2.6	95.7	690	601	1,840	.87	7.6
Texas	NC	NC	NC	NC	NC	NC	NF
Urban Status							
Urban	8.2	94.8	683	614	2,194	.90	4.2
Central City	2.7	74.1	534	440	1,548	.82	4.3
Suburban	5.5	105.0	757	701	2,515	.92	5.1
Rural	2.6	94.7	685	607	2,477	.89	3.2
Climate Zone [1]							
Under 2,000 CDD and Over 7,000 HDD	2.0	100.4	726	633	2,582	.87	4.7
5,500 to 7,000 HDD	3.4	108.7	785	709	2,530	.90	6.4
4,000 to 5,499 HDD	4.8	87.9	634	569	1,977	.90	5.7
Under 4,000 HDD	.4	66.0	476	431	1,805	.91	12.5
2,000 CDD or More and Under 4,000 HDD	Q	Q	Q	Q	Q	Q	NF
Type of Housing Unit							
Single-Family	8.0	104.3	753	692	2,666	.92	3.3
Detached	7.4	105.7	763	701	2,706	.92	3.4
Attached	.6	86.9	627	571	2,160	.91	10.0
Mobile Home	.3	57.0	414	390	789	.94	8.6
Multifamily	2.5	68.6	495	384	1,144	.78	6.5
2 to 4 Units	.9	101.6	733	666	1,675	.91	6.1
5 or More Units	1.6	50.7	365	230	854	.63	4.5
Heated Floorspace (square feet)							
Fewer than 1,000	2.4	57.3	414	329	821	.79	4.8
1,000 to 1,999	3.9	89.8	648	588	1,942	.91	3.6
2,000 to 2,999	2.9	112.5	812	742	2,778	.91	3.2
3,000 or More	1.6	129.8	936	857	4,227	.92	5.4
Total Number of Rooms (Excluding Bathrooms)							
1 or 2	.4	46.6	336	272	601	.81	14.8
3 to 5	4.3	76.2	550	467	1,521	.85	4.2
6 to 8	5.1	104.3	752	692	2,721	.92	2.7
9 or More	.9	149.1	1076	994	3,887	.92	6.9

See footnotes at end of table.

Table 5.6. Fuel Oil Consumption and Expenditures in U.S. Households, 1993 (Continued)

Characteristics	Households Using Fuel Oil (million)	Average per Household					RSE Row Factors
		Consumption		Expenditures (dollars)	Floorspace (square feet)	Expenditures (dollars per gallon)	
		(million Btu)	(gallons)				
RSE Column Factors:	2.1	1.2	1.2	1.3	0.9	0.3	
Ownership of Unit							
Owned	7.7	105.7	763	701	2,615	0.92	3.2
Rented	3.1	67.4	487	393	1,382	.81	4.7
Public Housing	.2	47.6	343	206	1,077	.60	31.5
Not Public Housing	2.9	68.7	496	404	1,401	.82	4.8
Rent Subsidy	.2	69.9	505	393	1,085	.78	12.4
No Rent Subsidy	2.7	68.6	495	405	1,430	.82	5.5
Year of Construction							
1939 or Before	4.3	101.5	733	646	2,219	.88	3.8
1940 to 1949	1.2	84.9	613	538	1,853	.88	7.2
1950 to 1959	1.9	102.3	738	691	2,362	.94	7.9
1960 to 1969	1.3	82.2	593	534	2,264	.90	8.6
1970 to 1979	1.4	88.1	636	565	2,354	.89	7.7
1980 to 1984	.3	70.5	508	461	2,372	.91	8.8
1985 to 1987	.2	103.0	742	668	3,124	.90	13.4
1988 to 1990	.2	88.0	635	573	2,423	.90	10.7
1991 to 1993 [2]	.1	105.4	760	697	3,443	.92	9.7
All Fuel Oil Paid by Household							
Yes	8.6	102.8	742	682	2,577	.92	3.2
No	2.1	62.2	449	331	994	.74	6.0
1993 Family Income							
Less than $5,000	.4	68.6	495	421	1,439	.85	13.7
$5,000 to $9,999	.9	82.1	593	514	1,601	.87	6.5
$10,000 to $14,999	1.0	92.8	671	581	1,814	.87	7.9
$15,000 to $19,999	.9	94.7	684	600	1,866	.88	7.0
$20,000 to $24,999	.9	87.3	630	541	2,021	.86	7.5
$25,000 to $34,999	1.7	94.8	684	616	2,376	.90	6.8
$35,000 to $49,999	2.4	88.8	640	575	2,388	.90	4.9
$50,000 to $74,999	1.6	105.0	757	696	2,665	.92	4.2
$75,000 or More	.9	125.9	907	856	3,166	.94	7.7
Below Poverty Line							
100 Percent	1.3	74.7	539	453	1,595	.84	6.7
125 Percent	1.8	76.5	553	463	1,582	.84	6.3
150 Percent	2.3	79.1	572	487	1,625	.85	5.5
Eligible for Federal Assistance [3]	**3.0**	**84.8**	**612**	**527**	**1,704**	**.86**	**5.2**
Age of Householder							
Under 25 Years	.4	58.9	426	367	1,368	.86	13.2
25 to 34 Years	1.6	89.8	648	555	1,878	.86	5.5
35 to 44 Years	2.4	86.1	621	561	2,336	.90	4.7
45 to 59 Years	2.7	97.4	703	635	2,373	.90	4.4
60 Years and Over	3.7	104.5	754	680	2,391	.90	4.8
Education of Householder							
12 Years or Fewer	6.0	87.6	632	554	2,026	.88	3.3
13 to 16 Years	3.6	99.8	720	656	2,488	.91	4.4
17 Years or More	1.2	115.5	833	774	2,768	.93	7.4
Race of Householder							
White	9.6	96.7	698	628	2,367	.90	3.4
Black	.8	83.6	602	528	1,551	.88	8.2
Other [4]	.4	70.8	511	399	1,180	.78	9.6

See footnotes at end of table.

Table 5.6. Fuel Oil Consumption and Expenditures in U.S. Households, 1993 (Continued)

Characteristics	Households Using Fuel Oil (million)	Average per Household					RSE Row Factors
		Consumption		Expenditures (dollars)	Floorspace (square feet)	Expenditures (dollars per gallon)	
		(million Btu)	(gallons)				
RSE Column Factors:	2.1	1.2	1.2	1.3	0.9	0.3	
Householder of Hispanic Descent							
Yes	0.9	79.7	575	456	1,600	0.79	6.8
No	9.9	96.2	694	627	2,324	.90	3.3
Household Size							
1 Person	2.4	84.0	607	547	1,717	.90	5.9
2 Persons	3.5	94.8	684	608	2,326	.89	4.6
3 Persons	2.0	100.2	723	654	2,490	.91	4.5
4 Persons	1.7	98.7	712	644	2,438	.90	4.6
5 Persons	.8	98.8	712	625	2,412	.88	8.4
6 or More Persons	.4	104.5	754	663	2,682	.88	8.9

[1] Climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[2] Does not include all new construction for 1993.
[3] Below 150 percent of poverty line or 60 percent of median State income.
[4] Includes some householders who described themselves as Hispanic rather than White, Black, or other.
NC = No cases in sample.
NF = No applicable RSE row factor.
Q = Data withheld either because the Relative Standard Error (RSE) was greater than 50 percent or fewer than 10 households were sampled.
Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • See ''Glossary'' for definition of terms used in this report.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A, B, C, and G of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.7. Kerosene Consumption and Expenditures in U.S. Households, 1993

Characteristics	Households Using Kerosene (million)	Average per Household				Expenditures (dollars per gallon)	RSE Row Factors
		Consumption		Expenditures (dollars)	Floorspace (square feet)		
		(million Btu)	(gallons)				
RSE Column Factors:	1.5	1.7	1.7	1.7	0.7	0.2	
Total U.S. Households	**3.6**	**12.8**	**95**	**103**	**1,854**	**1.09**	**7.5**
Census Region and Division							
Northeast	.8	25.3	187	193	1,771	1.03	10.2
New England	.3	34.3	254	262	1,650	1.03	14.2
Middle Atlantic	.5	21.0	155	160	1,828	1.03	13.4
Midwest	1.0	6.0	45	54	2,640	1.20	19.3
East North Central	.9	6.1	45	54	2,608	1.19	21.7
West North Central	.1	5.3	39	48	2,899	1.21	32.4
South	1.8	11.5	85	95	1,512	1.12	9.5
South Atlantic	1.4	12.2	91	101	1,448	1.12	10.5
East South Central	.3	Q	Q	Q	1,655	1.08	17.4
West South Central	Q	Q	Q	Q	Q	Q	NF
West	Q	Q	Q	Q	Q	Q	NF
Mountain	Q	Q	Q	Q	Q	Q	NF
Pacific	Q	Q	Q	Q	Q	Q	NF
Largest Populated States							
California	Q	Q	Q	Q	Q	Q	NF
Florida	Q	13.2	98	125	1,090	1.28	30.6
New York	.3	25.2	187	197	1,638	1.05	19.1
Texas	Q	Q	Q	Q	Q	Q	NF
Urban Status							
Urban	1.8	11.9	88	98	1,994	1.11	10.7
Central City	.5	13.6	101	107	1,476	1.06	14.4
Suburban	1.3	11.3	83	94	2,208	1.13	14.5
Rural	1.8	13.7	101	109	1,710	1.07	10.2
Climate Zone [1]							
Under 2,000 CDD and							
Over 7,000 HDD	.4	30.0	222	230	1,843	1.04	13.2
5,500 to 7,000 HDD	.9	11.9	88	97	2,616	1.10	17.3
4,000 to 5,499 HDD	1.1	8.6	64	68	1,862	1.07	14.2
Under 4,000 HDD	.8	13.7	101	110	1,317	1.09	12.0
2,000 CDD or More and							
Under 4,000 HDD	.5	9.9	73	89	1,292	1.21	16.2
Type of Housing Unit							
Single-Family	2.6	9.9	73	81	2,188	1.11	8.8
Detached	2.5	10.2	75	84	2,228	1.11	9.1
Attached	.2	Q	Q	Q	1,556	1.09	25.7
Mobile Home	.7	26.2	194	207	894	1.07	11.1
Multifamily	.3	7.4	55	58	1,109	1.06	15.2
2 to 4 Units	.2	5.6	42	44	1,289	1.06	20.7
5 or More Units	Q	Q	Q	Q	Q	Q	NF
Heated Floorspace (square feet)							
Fewer than 1,000	1.2	19.7	146	157	851	1.08	9.2
1,000 to 1,999	1.4	11.2	83	91	1,783	1.09	9.9
2,000 to 2,999	.6	4.6	34	40	2,649	1.16	16.1
3,000 or More	.3	Q	Q	Q	4,377	1.10	12.9
Total Number of Rooms (Excluding Bathrooms)							
1 or 2	Q	Q	Q	Q	Q	Q	NF
3 to 5	1.9	17.5	130	139	1,236	1.07	8.6
6 to 8	1.4	8.3	62	69	2,403	1.13	11.2
9 or More	.2	2.7	20	25	3,679	1.26	24.3

See footnotes at end of table.

Table 5.7. Kerosene Consumption and Expenditures in U.S. Households, 1993 (Continued)

Characteristics	Households Using Kerosene (million)	Average per Household					RSE Row Factors
		Consumption		Expenditures (dollars)	Floorspace (square feet)	Expenditures (dollars per gallon)	
		(million Btu)	(gallons)				
RSE Column Factors:	1.5	1.7	1.7	1.7	0.7	0.2	
Ownership of Unit							
Owned	2.5	12.4	92	101	2,137	1.10	8.8
Rented	1.1	13.8	102	109	1,186	1.07	11.4
Public Housing	Q	Q	Q	Q	Q	Q	NF
Not Public Housing	1.1	13.2	98	104	1,191	1.07	11.5
Rent Subsidy	Q	Q	Q	Q	Q	Q	NF
No Rent Subsidy	1.0	13.4	99	106	1,196	1.07	11.4
Year of Construction							
1939 or Before	1.1	11.7	86	95	1,994	1.10	11.7
1940 to 1949	.3	13.9	103	107	1,941	1.04	17.7
1950 to 1959	.4	9.6	71	89	1,469	1.25	23.4
1960 to 1969	.7	7.6	56	66	1,998	1.18	16.9
1970 to 1979	.6	19.7	146	150	1,760	1.03	14.5
1980 to 1984	.2	15.2	113	125	1,631	1.11	16.8
1985 to 1987	.2	10.2	76	81	1,725	1.07	17.3
1988 to 1990	.2	21.0	156	160	1,888	1.02	25.5
1991 to 1993 [2]	Q	Q	Q	Q	Q	Q	NF
1993 Family Income							
Less than $5,000	.2	17.7	131	135	1,055	1.03	20.6
$5,000 to $9,999	.5	14.6	108	115	1,251	1.07	13.9
$10,000 to $14,999	.4	17.9	133	140	1,288	1.06	17.9
$15,000 to $19,999	.6	19.2	142	155	1,801	1.09	14.1
$20,000 to $24,999	.3	15.5	115	136	1,288	1.18	22.2
$25,000 to $34,999	.5	12.4	92	97	1,531	1.05	20.1
$35,000 to $49,999	.5	6.3	46	51	2,297	1.10	12.9
$50,000 to $74,999	.4	5.1	37	46	2,960	1.22	17.7
$75,000 or More	.3	Q	Q	Q	3,004	1.19	21.3
Below Poverty Line							
100 Percent	.8	15.6	116	123	1,176	1.06	11.3
125 Percent	1.0	15.6	115	125	1,322	1.08	11.0
150 Percent	1.2	15.1	112	120	1,374	1.07	10.4
Eligible for Federal Assistance [3]	**1.4**	**16.8**	**125**	**134**	**1,450**	**1.07**	**9.6**
Age of Householder							
Under 25 Years	.2	11.3	84	87	825	1.03	20.9
25 to 34 Years	.6	13.8	103	121	1,602	1.18	15.2
35 to 44 Years	1.0	13.2	98	104	1,805	1.07	10.5
45 to 59 Years	1.0	9.7	72	78	2,093	1.08	14.1
60 Years and Over	.7	16.2	120	128	2,134	1.07	14.1
Education of Householder							
12 Years or Fewer	2.5	14.1	105	115	1,642	1.10	8.3
13 to 16 Years	.9	10.4	77	82	1,985	1.06	12.3
17 Years or More	.3	Q	Q	Q	3,157	1.10	23.7
Race of Householder							
White	3.0	12.1	90	97	1,991	1.07	7.7
Black	.5	16.4	121	140	1,164	1.16	17.7
Other [4]	Q	Q	Q	Q	Q	Q	NF
Householder of Hispanic Descent							
Yes	.2	Q	Q	Q	1,879	1.06	33.8
No	3.5	12.9	95	104	1,852	1.09	7.7

See footnotes at end of table.

Table 5.7. Kerosene Consumption and Expenditures in U.S. Households, 1993 (Continued)

Characteristics	Households Using Kerosene (million)	Average per Household				Expenditures (dollars per gallon)	RSE Row Factors
		Consumption		Expenditures (dollars)	Floorspace (square feet)		
		(million Btu)	(gallons)				
RSE Column Factors:	1.5	1.7	1.7	1.7	0.7	0.2	
Household Size							
1 Person	0.6	17.5	130	134	1,317	1.03	12.5
2 Persons	1.1	13.0	96	108	1,819	1.12	12.1
3 Persons	.9	10.9	81	90	2,112	1.11	15.8
4 Persons	.6	9.4	70	74	2,186	1.06	14.0
5 Persons	.4	15.9	118	132	1,739	1.12	16.5
6 or More Persons	Q	Q	Q	Q	Q	Q	NF

[1] Climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[2] Does not include all new construction for 1993.
[3] Below 150 percent of poverty line or 60 percent of median State income.
[4] Includes some householders who described themselves as Hispanic rather than White, Black, or other.
NF = No applicable RSE row factor.
Q = Data withheld either because the Relative Standard Error (RSE) was greater than 50 percent or fewer than 10 households were sampled.
Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • See ''Glossary'' for definition of terms used in this report.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A, B, C, and G of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.8. Liquefied Petroleum Gas Consumption and Expenditures in U.S. Households, 1993

Characteristics	Households Using LPG (million)	Average per Household				Expenditures (dollars per gallon)	RSE Row Factors
		Consumption		Expenditures (dollars)	Floorspace (square feet)		
		(million Btu)	(gallons)				
RSE Column Factors:	1.9	1.3	1.3	1.0	0.7	0.5	
Total U.S. Households	**8.1**	**46.8**	**513**	**470**	**1,841**	**0.92**	**4.5**
Census Region and Division							
Northeast	1.2	20.6	226	286	1,971	1.27	13.7
New England	.6	23.8	260	310	1,905	1.19	18.7
Middle Atlantic	.7	17.9	196	266	2,026	1.36	15.8
Midwest	2.2	86.0	942	736	2,424	.78	5.0
East North Central	1.1	96.2	1053	834	2,648	.79	8.0
West North Central	1.1	76.0	832	639	2,204	.77	6.6
South	4.0	32.9	360	366	1,532	1.02	5.8
South Atlantic	2.3	28.6	313	355	1,587	1.14	10.1
East South Central	.9	40.7	446	411	1,413	.92	7.3
West South Central	.7	37.0	405	343	1,508	.85	17.3
West	.8	50.2	549	551	1,581	1.00	9.7
Mountain	.4	66.4	728	626	1,564	.86	8.6
Pacific	.3	29.8	326	458	1,602	1.40	10.9
Largest Populated States							
California	.3	26.0	285	401	1,491	1.41	7.8
Florida	.8	15.8	173	252	1,589	1.46	11.7
New York	.4	21.6	236	298	2,304	1.26	16.5
Texas	Q	32.7	358	294	1,528	.82	27.8
Urban Status							
Urban	3.2	37.5	410	409	1,920	1.00	6.6
Central City	.6	26.1	286	320	1,669	1.12	17.4
Suburban	2.6	40.0	438	429	1,976	.98	7.0
Rural	4.9	53.0	580	510	1,789	.88	5.6
Climate Zone [1]							
Under 2,000 CDD and							
Over 7,000 HDD	1.3	53.0	580	504	2,130	.87	10.0
5,500 to 7,000 HDD	1.6	69.5	761	632	2,255	.83	13.7
4,000 to 5,499 HDD	1.3	54.7	599	542	2,069	.91	20.6
Under 4,000 HDD	1.6	38.6	422	429	1,397	1.02	8.5
2,000 CDD or More and							
Under 4,000 HDD	2.3	28.8	316	326	1,564	1.03	9.8
Type of Housing Unit							
Single-Family	6.0	50.5	553	498	2,149	.90	5.2
Detached	5.9	50.6	554	499	2,153	.90	5.2
Attached	Q	Q	Q	Q	Q	Q	NF
Mobile Home	1.9	38.6	423	406	904	.96	7.0
Multifamily	.3	20.6	226	278	1,460	1.23	21.0
2 to 4 Units	.2	17.0	186	233	1,672	1.25	28.4
5 or More Units	Q	Q	Q	Q	Q	Q	NF
Heated Floorspace (square feet)							
Fewer than 1,000	2.6	34.9	382	380	856	.99	6.7
1,000 to 1,999	3.2	44.6	489	453	1,630	.93	5.6
2,000 to 2,999	1.5	53.5	586	532	2,716	.91	6.5
3,000 or More	.8	80.4	880	705	4,144	.80	8.3
Total Number of Rooms (Excluding Bathrooms)							
1 or 2	Q	Q	Q	Q	Q	Q	NF
3 to 5	4.3	37.9	415	394	1,261	.95	6.3
6 to 8	3.4	56.1	615	548	2,403	.89	5.4
9 or More	.4	65.0	712	627	3,261	.88	12.3

See footnotes at end of table.

Table 5.8. Liquefied Petroleum Gas Consumption and Expenditures in U.S. Households, 1993 (Continued)

Characteristics	Households Using LPG (million)	Average per Household					RSE Row Factors
		Consumption		Expenditures (dollars)	Floorspace (square feet)	Expenditures (dollars per gallon)	
		(million Btu)	(gallons)				
RSE Column Factors:	1.9	1.3	1.3	1.0	0.7	0.5	
Ownership of Unit							
Owned	6.5	49.1	538	487	1,962	0.91	4.6
Rented	1.6	37.6	412	402	1,353	.98	7.8
Public Housing	Q	Q	Q	Q	Q	Q	NF
Not Public Housing	1.6	37.3	408	399	1,359	.98	7.9
Rent Subsidy	Q	Q	Q	Q	Q	Q	NF
No Rent Subsidy	1.6	36.1	396	390	1,332	.99	8.4
Year of Construction							
1939 or Before	2.2	58.8	644	546	2,260	.85	5.8
1940 to 1949	.6	51.9	569	518	1,573	.91	16.2
1950 to 1959	.8	34.5	377	363	1,532	.96	10.3
1960 to 1969	1.1	46.5	509	486	1,721	.95	9.6
1970 to 1979	1.6	40.4	443	413	1,550	.93	6.2
1980 to 1984	.5	31.9	350	337	1,580	.96	11.8
1985 to 1987	.4	47.5	521	509	1,929	.98	13.2
1988 to 1990	.5	39.0	427	446	1,777	1.04	13.8
1991 to 1993 [2]	.4	55.2	604	553	2,371	.92	13.6
All LPG Paid by Household							
Yes	7.9	46.7	512	469	1,853	.92	4.6
No	.2	49.9	546	505	1,421	.92	15.9
1993 Family Income							
Less than $5,000	.4	34.5	378	368	1,104	.97	15.9
$5,000 to $9,999	1.0	42.3	464	443	1,186	.96	10.1
$10,000 to $14,999	1.0	35.5	389	377	1,430	.97	7.2
$15,000 to $19,999	.9	44.8	490	456	1,599	.93	10.4
$20,000 to $24,999	.9	46.4	508	465	1,617	.92	8.1
$25,000 to $34,999	1.6	48.4	530	477	1,910	.90	6.2
$35,000 to $49,999	1.2	56.6	620	546	2,394	.88	7.6
$50,000 to $74,999	.7	60.7	664	588	2,845	.88	10.4
$75,000 or More	.4	46.4	509	466	2,683	.92	12.9
Below Poverty Line							
100 Percent	1.6	38.6	423	410	1,177	.97	8.6
125 Percent	2.3	38.4	421	397	1,208	.94	7.2
150 Percent	2.7	38.4	420	401	1,259	.95	6.7
Eligible for Federal Assistance [3]	**3.0**	**38.3**	**419**	**404**	**1,386**	**.96**	**6.1**
Age of Householder							
Under 25 Years	.3	32.6	357	336	893	.94	12.2
25 to 34 Years	1.4	42.6	466	437	1,669	.94	6.4
35 to 44 Years	1.8	41.2	451	433	1,980	.96	7.4
45 to 59 Years	2.1	52.0	569	511	1,914	.90	8.0
60 Years and Over	2.5	50.9	557	499	1,901	.90	7.7
Education of Householder							
12 Years or Fewer	5.7	45.9	502	459	1,636	.91	5.2
13 to 16 Years	2.1	48.4	530	488	2,303	.92	5.2
17 Years or More	.3	54.6	598	559	2,523	.93	12.0
Race of Householder							
White	7.4	48.8	535	486	1,893	.91	4.3
Black	.6	24.0	263	287	1,174	1.09	10.5
Other [4]	.1	31.0	340	371	1,779	1.09	26.7

See footnotes at end of table.

Table 5.8. Liquefied Petroleum Gas Consumption and Expenditures in U.S. Households, 1993 (Continued)

Characteristics	Households Using LPG (million)	Average per Household				Expenditures (dollars per gallon)	RSE Row Factors
		Consumption		Expenditures (dollars)	Floorspace (square feet)		
		(million Btu)	(gallons)				
RSE Column Factors:	1.9	1.3	1.3	1.0	0.7	0.5	
Householder of Hispanic Descent							
Yes	0.5	25.5	279	307	1,484	1.10	17.8
No	7.7	48.1	527	480	1,862	.91	4.5
Household Size							
1 Person	1.5	40.7	445	408	1,315	.92	9.3
2 Persons	2.9	49.6	543	497	1,907	.92	6.9
3 Persons	1.4	45.9	503	468	1,981	.93	8.9
4 Persons	1.2	45.9	503	469	1,983	.93	7.8
5 Persons	.8	51.1	560	493	1,964	.88	9.8
6 or More Persons	.3	47.0	515	462	2,230	.90	14.3

[1] Climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[2] Does not include all new construction for 1993.
[3] Below 150 percent of poverty line or 60 percent of median State income.
[4] Includes some householders who described themselves as Hispanic rather than White, Black, or other.
NF = No applicable RSE row factor.
Q = Data withheld either because the Relative Standard Error (RSE) was greater than 50 percent or fewer than 10 households were sampled.
Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • See ''Glossary'' for definition of terms used in this report.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A, B, C, and D of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.9. Wood Consumption in U.S. Households, December 1992 Through November 1993

Characteristics	Households Using Wood					Wood Used as Main Space-Heating Fuel					RSE Row Factors
		Consumption					Consumption				
		Total		Average per Household			Total		Average per Household		
	Households (millions)	(quadrillion Btu)	(million cords)	(million Btu)	(cords)	Households (millions)	(quadrillion Btu)	(million cords)	(million Btu)	(cords)	
RSE Column Factors:	0.6	1.0	1.0	0.8	0.8	1.1	1.5	1.5	1.0	1.0	
Total U.S. Households	**20.4**	**0.55**	**27.4**	**26.8**	**1.3**	**3.1**	**0.25**	**12.6**	**81.3**	**4.1**	**8.3**
Census Region and Division											
Northeast	3.4	.14	7.1	41.1	2.1	.5	.06	3.0	132.3	6.6	20.5
New England	1.1	.05	2.3	44.1	2.2	.2	.02	1.0	105.4	5.3	17.0
Middle Atlantic	2.4	.10	4.8	39.8	2.0	.3	.04	2.0	152.6	7.6	29.2
Midwest	4.1	.11	5.5	27.2	1.4	.4	.05	2.5	129.0	6.4	21.4
East North Central	2.6	.07	3.4	26.2	1.3	.2	.03	1.5	136.9	6.8	27.5
West North Central	1.5	.04	2.1	28.9	1.4	Q	Q	Q	118.7	5.9	29.5
South	7.2	.17	8.7	24.3	1.2	1.1	.07	3.7	64.4	3.2	12.7
South Atlantic	3.9	.09	4.7	24.0	1.2	.7	.04	2.2	66.0	3.3	19.3
East South Central	1.3	.05	2.4	37.5	1.9	.3	.02	1.2	76.2	3.8	17.1
West South Central	2.0	.03	1.7	16.7	.8	.2	.01	.4	38.4	1.9	23.0
West	5.7	.12	6.0	21.2	1.1	1.1	.07	3.4	61.0	3.1	10.2
Mountain	1.3	.03	1.5	23.6	1.2	.2	.01	.7	71.8	3.6	24.3
Pacific	4.4	.09	4.5	20.4	1.0	.9	.05	2.7	58.7	2.9	11.6
Largest Populated States											
California	3.0	.06	3.0	20.0	1.0	.6	.03	1.6	53.5	2.7	14.7
Florida	1.0	Q	Q	10.8	.5	Q	Q	Q	Q	Q	51.8
New York	1.0	.06	2.8	56.7	2.8	.2	Q	Q	179.1	9.0	41.3
Texas	1.3	.01	.7	10.8	.5	Q	Q	Q	Q	Q	25.8
Urban Status											
Urban	15.6	.30	14.8	19.1	1.0	1.2	.10	4.8	79.5	4.0	12.0
Central City	4.0	.05	2.4	12.2	.6	.3	.02	.9	65.0	3.2	19.2
Suburban	11.6	.25	12.4	21.4	1.1	.9	.08	3.9	83.7	4.2	13.0
Rural	4.9	.25	12.6	51.7	2.6	1.9	.16	7.8	82.5	4.1	11.8
Climate Zone [1]											
Under 2,000 CDD and											
Over 7,000 HDD	2.3	.14	7.0	59.9	3.0	.7	.08	4.1	122.0	6.1	19.5
5,500 to 7,000 HDD	4.5	.11	5.6	24.9	1.2	.3	.04	1.8	111.1	5.6	19.8
4,000 to 5,499 HDD	5.4	.14	6.8	25.5	1.3	.8	.07	3.5	83.7	4.2	18.1
Under 4,000 HDD	4.0	.09	4.6	22.8	1.1	.8	.05	2.5	62.3	3.1	12.7
2,000 CDD or More and											
Under 4,000 HDD	4.2	.07	3.4	16.0	.8	.5	.02	.8	31.4	1.6	19.1
Type of Housing Unit											
Single-Family	18.8	.51	25.6	27.2	1.4	2.8	.23	11.5	82.1	4.1	8.2
Detached	17.9	.50	25.2	28.1	1.4	2.7	.23	11.4	83.1	4.2	8.3
Attached	.9	.01	.4	9.4	.5	Q	Q	Q	Q	Q	27.3
Mobile Home	.6	.03	1.3	40.5	2.0	.2	.02	.9	75.3	3.8	31.4
Multifamily	.9	.01	.5	10.1	.5	Q	Q	Q	Q	Q	37.3
2 to 4 Units	.5	.01	.4	16.2	.8	Q	Q	Q	Q	Q	48.3
5 or More Units	.5	(*)	.1	4.0	.2	NC	NC	NC	NC	NC	44.2
Heated Floorspace (square feet)											
Fewer than 1,000	1.4	.05	2.6	38.7	1.9	.6	.04	2.1	76.1	3.8	18.8
1,000 to 1,999	8.5	.22	10.8	25.4	1.3	1.5	.11	5.4	71.9	3.6	10.7
2,000 to 2,999	6.4	.17	8.6	26.8	1.3	.7	.06	3.2	95.3	4.8	13.5
3,000 or More	4.1	.11	5.3	25.9	1.3	.4	.04	1.9	102.0	5.1	16.1

See footnotes at end of table.

Table 5.9. Wood Consumption in U.S. Households, December 1992 Through November 1993 (Continued)

Characteristics	Households Using Wood					Wood Used as Main Space-Heating Fuel					RSE Row Factors
		Consumption					Consumption				
		Total		Average per Household			Total		Average per Household		
	Households (millions)	(quadrillion Btu)	(million cords)	(million Btu)	(cords)	Households (millions)	(quadrillion Btu)	(million cords)	(million Btu)	(cords)	
RSE Column Factors:	0.6	1.0	1.0	0.8	0.8	1.1	1.5	1.5	1.0	1.0	
Total Number of Rooms (Excluding Bathrooms)											
1 or 2	Q	Q	Q	Q	Q	NC	NC	NC	NC	NC	NF
3 to 5	5.2	0.17	8.7	33.8	1.7	1.3	0.11	5.6	87.6	4.4	12.2
6 to 8	12.8	.31	15.7	24.5	1.2	1.6	.12	5.8	72.1	3.6	11.3
9 or More	2.5	.06	3.0	24.4	1.2	.2	.03	1.3	110.5	5.5	24.5
Ownership of Unit											
Owned	17.9	.49	24.4	27.3	1.4	2.7	.22	10.8	81.2	4.1	8.5
Rented	2.5	.06	3.0	23.7	1.2	.4	.04	1.8	81.9	4.1	18.1
Public Housing	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	NF
Not Public Housing	2.5	.06	2.9	23.9	1.2	.4	.04	1.8	85.7	4.3	18.0
Rent Subsidy	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	NF
No Rent Subsidy	2.4	.05	2.7	22.7	1.1	.4	.03	1.6	78.1	3.9	16.0
Year of Construction											
1939 or Before	2.7	.13	6.7	50.2	2.5	.7	.08	3.8	113.5	5.7	16.9
1940 to 1949	1.2	.03	1.5	26.0	1.3	.2	.01	.7	65.6	3.3	17.4
1950 to 1959	2.7	.07	3.4	24.8	1.2	.4	.03	1.4	65.9	3.3	17.5
1960 to 1969	3.1	.07	3.4	22.2	1.1	.4	.03	1.4	67.9	3.4	16.3
1970 to 1979	4.5	.12	6.1	27.1	1.4	.8	.06	2.8	72.7	3.6	12.8
1980 to 1984	2.1	.07	3.4	31.9	1.6	.3	.04	1.9	112.7	5.6	16.7
1985 to 1987	1.5	.02	1.0	13.6	.7	.1	.01	.3	57.9	2.9	22.7
1988 to 1990	1.5	.02	1.1	14.1	.7	.2	.01	.3	39.1	2.0	24.9
1991 to 1993 [2]	1.2	.02	.8	13.8	.7	Q	Q	Q	Q	Q	24.6
1993 Family Income											
Less than $5,000	.3	.01	.7	50.4	2.5	Q	Q	Q	Q	Q	49.1
$5,000 to $9,999	.8	.04	1.8	46.2	2.3	.3	.03	1.3	91.5	4.6	25.9
$10,000 to $14,999	1.1	.06	2.9	51.8	2.6	.4	.04	2.1	96.0	4.8	17.0
$15,000 to $19,999	1.4	.05	2.3	33.0	1.6	.2	.03	1.3	112.4	5.6	26.6
$20,000 to $24,999	1.3	.06	2.8	43.1	2.2	.3	.03	1.4	105.2	5.3	19.6
$25,000 to $34,999	2.7	.07	3.4	25.9	1.3	.4	.03	1.3	67.8	3.4	15.9
$35,000 to $49,999	4.6	.12	5.9	25.9	1.3	.7	.06	2.8	77.3	3.9	15.0
$50,000 to $74,999	4.7	.09	4.3	18.2	.9	.4	.03	1.5	70.9	3.5	14.8
$75,000 or More	3.7	.07	3.3	17.9	.9	.2	.01	.7	62.4	3.1	17.2
Below Poverty Line											
100 Percent	1.2	.06	3.2	51.7	2.6	.5	.04	2.0	80.6	4.0	22.1
125 Percent	1.9	.11	5.3	56.6	2.8	.8	.07	3.6	92.6	4.6	18.4
150 Percent	2.6	.13	6.3	48.5	2.4	.9	.08	4.2	91.4	4.6	16.9
Eligible for Federal Assistance [3]	**3.3**	**.15**	**7.7**	**47.4**	**2.4**	**1.1**	**.10**	**5.2**	**90.5**	**4.5**	**14.1**
Age of Householder											
Under 25 Years	.5	.01	.4	16.0	.8	Q	Q	Q	Q	Q	38.9
25 to 34 Years	3.6	.06	3.1	17.5	.9	.4	.03	1.5	66.4	3.3	15.4
35 to 44 Years	5.9	.16	8.0	27.1	1.4	.9	.08	3.9	87.4	4.4	10.7
45 to 59 Years	6.0	.17	8.6	28.4	1.4	1.0	.08	4.0	83.9	4.2	13.9
60 Years and Over	4.5	.15	7.3	32.9	1.6	.7	.06	3.0	81.4	4.1	13.9

See footnotes at end of table.

Table 5.9. Wood Consumption in U.S. Households, December 1992 Through November 1993 (Continued)

Characteristics	Households Using Wood					Wood Used as Main Space-Heating Fuel					RSE Row Factors
		Consumption					Consumption				
		Total		Average per Household			Total		Average per Household		
	Households (millions)	(quadrillion Btu	(million cords)	(million Btu)	(cords)	Households (millions)	(quadrillion Btu	(million cords)	(million Btu)	(cords)	
RSE Column Factors:	0.6	1.0	1.0	0.8	0.8	1.1	1.5	1.5	1.0	1.0	
Education of Householder											
12 Years or Fewer	8.0	0.30	15.2	38.1	1.9	1.9	0.16	8.1	83.7	4.2	11.7
13 Years or More	12.4	.24	12.1	19.6	1.0	1.2	.09	4.5	77.4	3.9	9.0
Race of Householder											
White	18.9	.53	26.3	27.8	1.4	2.9	.24	12.0	83.8	4.2	8.8
Black	.9	.01	.6	13.6	.7	.2	.01	.3	39.7	2.0	24.4
Other [4]	.6	.01	.5	17.9	.9	Q	Q	Q	Q	Q	41.9
Householder of Hispanic Descent											
Yes	.9	.02	.8	17.5	.9	.2	.01	.4	Q	Q	31.1
No	19.5	.53	26.6	27.3	1.4	2.9	.24	12.2	83.0	4.2	8.3
Household Size											
1 Person	2.1	.05	2.7	25.5	1.3	.4	.03	1.3	70.6	3.5	20.5
2 Persons	7.4	.19	9.4	25.7	1.3	1.0	.08	3.8	74.8	3.7	10.6
3 Persons	3.7	.10	5.2	28.3	1.4	.6	.05	2.5	89.2	4.5	17.8
4 Persons	4.6	.11	5.3	23.1	1.2	.6	.05	2.5	83.1	4.2	15.5
5 Persons	1.9	.07	3.4	35.1	1.8	.3	.04	1.9	107.6	5.4	22.1
6 or More Persons	.8	.03	1.4	35.7	1.8	.2	.01	.6	62.1	3.1	24.4
Main Heating Fuel											
Natural Gas	8.8	.11	5.5	12.4	.6	--	--	--	--	--	11.4
Electricity	5.4	.09	4.3	15.7	.8	--	--	--	--	--	13.9
Fuel Oil or Kerosene	2.3	.08	4.1	35.2	1.8	--	--	--	--	--	18.7
Wood	3.1	.25	12.6	81.3	4.1	3.1	.25	12.6	81.3	4.1	10.1
Heating Stove	2.4	.19	9.4	79.3	4.0	2.4	.19	9.4	79.3	4.0	10.1
Fireplace	.4	.02	1.0	45.4	2.3	.4	.02	1.0	45.4	2.3	22.9
Furnace/Other	.3	.04	2.2	151.5	7.6	.3	.04	2.2	151.5	7.6	20.1
LPG	.7	.02	.9	26.9	1.3	--	--	--	--	--	31.4
Other	Q	Q	Q	Q	Q	--	--	--	--	--	NF
Secondary Heating Equipment Used	**.8**	**.08**	**3.8**	**89.6**	**4.5**	**.7**	**.07**	**3.4**	**99.2**	**5.0**	**14.2**
Amount of Wood Burned in Past 12 Months											
Less than One-half Cord	9.6	.03	1.5	3.2	.2	Q	Q	Q	Q	Q	5.7
One-half to Less than 1	4.1	.05	2.4	11.7	.6	.4	(*)	.2	12.4	.6	6.3
1 to Less than 2	2.1	.04	2.2	21.8	1.1	.4	.01	.5	24.4	1.2	7.0
2 to 4 Cords	2.7	.15	7.4	54.3	2.7	1.2	.07	3.4	59.7	3.0	6.0
More than 4 Cords	1.7	.28	13.8	164.7	8.2	1.0	.17	8.4	163.5	8.2	10.9

See footnotes at end of table.

Table 5.9. Wood Consumption in U.S. Households, December 1992 Through November 1993 (Continued)

Characteristics	Households Using Wood					Wood Used as Main Space-Heating Fuel					RSE Row Factors
		Consumption					Consumption				
		Total		Average per Household			Total		Average per Household		
	Households (millions)	(quadrillion Btu	(million cords)	(million Btu)	(cords)	Households (millions)	(quadrillion Btu	(million cords)	(million Btu)	(cords)	
RSE Column Factors:	0.6	1.0	1.0	0.8	0.8	1.1	1.5	1.5	1.0	1.0	
Purchased Firewood											
Yes	6.9	0.24	12.0	34.6	1.7	1.4	0.12	5.8	83.3	4.2	13.0
No	13.2	.31	15.4	23.3	1.2	1.6	.14	6.8	84.7	4.2	8.4

[1] Climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[2] Does not include all new construction for 1993.
[3] Below 150 percent of poverty line or 60 percent of median State income.
[4] Includes some householders who described themselves as Hispanic rather than White, Black, or other.
(*) = Value rounds to zero in the units displayed.
-- = Data not applicable.
NC = No cases in sample.
NF = No applicable RSE row factor.
Q = Data withheld either because the Relative Standard Error (RSE) was greater than 50 percent or fewer than 10 households were sampled.
Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • See ''Glossary'' for definition of terms used in this report.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A, B, and C of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.10. Average Expenditures for Major Energy Sources in U.S. Households, 1993

(Dollars per Million Btu)

Characteristics	Major Energy Sources [1]	Electricity	Natural Gas	Fuel Oil	Kerosene	Liquefied Petroleum Gas	RSE Row Factors
RSE Column Factors:	1.0	0.8	0.8	0.8	1.3	1.7	
Total U.S. Households	**12.38**	**24.69**	**6.07**	**6.46**	**8.08**	**10.04**	**1.3**
Census Region and Division							
Northeast	12.47	33.55	7.73	6.41	7.64	13.90	2.2
New England	12.45	33.14	8.43	6.51	7.64	13.04	2.8
Middle Atlantic	12.47	33.69	7.59	6.35	7.64	14.86	2.5
Midwest	9.94	23.67	5.38	6.22	8.86	8.55	2.5
East North Central	9.79	24.57	5.41	6.28	8.85	8.67	3.3
West North Central	10.35	21.84	5.29	6.15	8.98	8.41	3.4
South	14.82	22.61	6.13	6.89	8.26	11.13	2.5
South Atlantic	16.55	23.71	7.15	6.90	8.27	12.44	3.0
East South Central	12.64	18.32	5.65	Q	8.00	10.10	4.4
West South Central	13.76	23.62	5.52	NC	Q	9.27	4.3
West	12.54	24.23	5.55	7.24	Q	10.99	3.8
Mountain	10.45	21.72	4.81	Q	Q	9.41	4.6
Pacific	13.61	25.29	5.96	7.31	Q	15.38	3.1
Largest Populated States							
California	14.47	32.86	6.09	Q	Q	15.42	2.2
Florida	22.63	24.41	8.48	Q	9.52	16.00	5.9
New York	13.01	40.62	8.37	6.28	7.79	13.83	3.1
Texas	14.24	23.52	5.54	NC	Q	8.98	5.6
Urban Status							
Urban	12.35	25.70	6.17	6.48	8.21	10.92	1.7
Central City	11.84	25.99	6.35	5.94	7.87	12.28	2.5
Suburban	12.67	25.55	6.03	6.67	8.38	10.72	1.9
Rural	12.50	21.82	5.55	6.41	7.96	9.62	2.3
Climate Zone [2]							
Under 2,000 CDD and Over 7,000 HDD	10.11	22.19	5.39	6.31	7.69	9.51	2.7
5,500 to 7,000 HDD	10.50	25.15	5.85	6.52	8.17	9.10	3.5
4,000 to 5,499 HDD	12.54	24.75	6.82	6.47	7.95	9.92	3.7
Under 4,000 HDD	14.10	25.91	6.20	6.53	8.04	11.12	3.8
2,000 CDD or More and Under 4,000 HDD	16.03	24.27	5.90	Q	8.97	11.31	3.2
Type of Housing Unit							
Single-Family	12.16	24.29	5.96	6.63	8.21	9.87	1.4
Detached	12.06	24.14	5.90	6.64	8.22	9.87	1.5
Attached	13.15	25.72	6.53	6.57	8.09	Q	3.4
Mobile Home	14.69	23.06	5.61	6.84	7.91	10.49	3.1
Multifamily	12.82	27.53	6.63	5.60	7.82	13.48	2.4
2 to 4 Units	11.18	28.25	6.62	6.56	7.87	13.70	3.0
5 or More Units	14.39	27.16	6.65	4.54	Q	Q	2.4
Heated Floorspace (square feet)							
Fewer than 1,000	13.12	25.19	6.35	5.74	7.98	10.88	1.9
1,000 to 1,999	12.77	24.54	6.08	6.54	8.11	10.14	1.6
2,000 to 2,999	11.87	24.61	6.00	6.59	8.60	9.95	2.3
3,000 or More	11.27	24.58	5.84	6.60	8.15	8.77	2.5
Total Number of Rooms (Excluding Bathrooms)							
1 or 2	13.88	28.03	7.24	5.82	Q	Q	6.3
3 to 5	12.96	24.89	6.20	6.13	7.96	10.40	1.6
6 to 8	12.10	24.35	5.99	6.64	8.36	9.76	1.7
9 or More	11.45	25.21	5.92	6.66	9.34	9.64	3.2
Ownership of Unit							
Owned	12.29	24.37	6.00	6.63	8.16	9.91	1.5
Rented	12.66	25.67	6.28	5.82	7.89	10.70	1.8
Public Housing	12.94	24.98	6.27	4.34	Q	Q	4.5
Not Public Housing	12.64	25.74	6.28	5.89	7.90	10.70	1.9
Rent Subsidy	11.93	26.82	6.65	5.62	Q	Q	4.6
No Rent Subsidy	12.69	25.68	6.25	5.91	7.90	10.79	1.9

See footnotes at end of table.

Table 5.10. Average Expenditures for Major Energy Sources in U.S. Households, 1993 (Continued)

(Dollars per Million Btu)

Characteristics	Major Energy Sources [1]	Electricity	Natural Gas	Fuel Oil	Kerosene	Liquefied Petroleum Gas	RSE Row Factors
RSE Column Factors:	1.0	0.8	0.8	0.8	1.3	1.7	
Year of Construction							
1939 or Before	10.24	26.03	6.20	6.36	8.15	9.29	2.0
1940 to 1949	11.09	24.36	6.18	6.33	7.68	9.97	2.7
1950 to 1959	12.16	26.66	6.23	6.76	9.25	10.52	2.6
1960 to 1969	12.22	25.22	5.97	6.49	8.76	10.45	2.5
1970 to 1979	13.91	23.49	5.72	6.41	7.60	10.22	2.1
1980 to 1984	15.53	24.07	6.03	6.53	8.20	10.54	3.2
1985 to 1987	15.06	24.05	6.11	6.49	7.96	10.71	2.8
1988 to 1990	14.63	23.42	5.90	6.51	7.58	11.42	3.3
1991 to 1993 [3]	13.49	23.35	6.09	6.62	Q	10.02	3.0
All Utilities Paid by Household							
Yes	12.52	24.34	6.02	6.64	8.10	10.03	1.4
No	11.17	29.82	6.45	5.42	7.77	10.09	2.7
1993 Family Income							
Less than $5,000	12.41	25.89	6.35	6.13	7.65	10.67	3.4
$5,000 to $9,999	11.99	24.80	6.16	6.27	7.90	10.47	2.5
$10,000 to $14,999	11.72	25.10	6.08	6.26	7.83	10.61	2.3
$15,000 to $19,999	11.73	23.94	5.90	6.34	8.07	10.18	2.5
$20,000 to $24,999	12.24	23.86	6.05	6.20	8.72	10.03	2.9
$25,000 to $34,999	12.58	24.06	5.99	6.50	7.78	9.87	2.0
$35,000 to $49,999	12.70	24.78	6.10	6.47	8.11	9.63	1.8
$50,000 to $74,999	12.52	24.44	6.00	6.63	9.02	9.69	2.5
$75,000 or More	12.93	26.25	6.24	6.80	8.85	10.03	3.1
Below Poverty Line							
100 Percent	12.30	25.15	6.22	6.06	7.88	10.61	2.1
125 Percent	12.27	24.91	6.20	6.05	7.99	10.33	2.0
150 Percent	12.32	24.68	6.16	6.15	7.95	10.45	1.9
Eligible for Federal Assistance [4]	**12.08**	**24.94**	**6.15**	**6.21**	**7.95**	**10.54**	**1.6**
Age of Householder							
Under 25 Years	12.68	24.16	5.95	6.22	7.65	10.30	3.2
25 to 34 Years	12.45	24.72	6.06	6.18	8.72	10.27	2.0
35 to 44 Years	13.02	24.70	6.15	6.52	7.92	10.50	1.7
45 to 59 Years	12.59	24.44	6.03	6.52	8.03	9.82	1.9
60 Years and Over	11.62	25.03	6.08	6.51	7.90	9.81	1.8
Education of Householder							
12 Years or Fewer	12.19	24.38	6.05	6.32	8.12	10.00	1.5
13 to 16 Years	12.67	24.77	6.05	6.58	7.87	10.09	1.4
17 Years or More	12.40	25.77	6.21	6.70	8.13	10.24	2.3
Race of Householder							
White	12.42	24.37	6.01	6.50	7.95	9.94	1.4
Black	11.72	26.26	6.29	6.32	8.57	11.96	2.6
Other [5]	13.59	27.91	6.54	5.63	Q	11.94	4.1
Householder of Hispanic Descent							
Yes	13.12	27.53	6.46	5.72	7.85	12.07	3.1
No	12.33	24.51	6.05	6.52	8.09	9.97	1.4

See footnotes at end of table.

Table 5.10. Average Expenditures for Major Energy Sources in U.S. Households, 1993 (Continued)

(Dollars per Million Btu)

Characteristics	Major Energy Sources [1]	Electricity	Natural Gas	Fuel Oil	Kerosene	Liquefied Petroleum Gas	
RSE Column Factors:	1.0	0.8	0.8	0.8	1.3	1.7	RSE Row Factors
Household Size							
1 Person	11.79	25.28	6.08	6.51	7.64	10.04	2.0
2 Persons	12.37	24.23	6.02	6.41	8.26	10.02	1.7
3 Persons	12.54	24.95	6.22	6.53	8.25	10.19	2.2
4 Persons	12.47	24.67	6.04	6.52	7.85	10.21	1.8
5 Persons	12.98	24.45	6.02	6.33	8.29	9.65	2.5
6 or More Persons	12.75	25.52	6.09	6.34	Q	9.83	3.8

[1] Major Energy Sources include: electricity, natural gas, fuel oil, kerosene, and liquefied petroleum gas.
[2] Climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[3] Does not include all new construction for 1993.
[4] Below 150 percent of poverty line or 60 percent of median State income.
[5] Includes some householders who described themselves as Hispanic rather than White, Black, or other.

NC = No cases in sample.

Q = Data withheld either because the Relative Standard Error (RSE) was greater than 50 percent or fewer than 10 households were sampled.

Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • See ''Glossary'' for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A-G of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.11. Total Consumption and Expenditures by End Uses in U.S. Households, 1993

Characteristics	Space Heating		Air Conditioning		Water Heating		Refrigerator		Appliances		RSE Row Factors
	Consumption (quadrillion Btu)	Expenditures (billion dollars)	Consumption (quadrillion Btu)	Expenditures (billion dollars)	Consumption (quadrillion Btu)	Expenditures (billion dollars)	Consumption (quadrillion Btu)	Expenditures (billion dollars)	Consumption (quadrillion Btu)	Expenditures (billion dollars)	
RSE Column Factors:	1.1 [1]	0.9 [1]	1.5 [1]	1.5 [1]	0.9 [1]	0.8 [1]	0.9 [1]	0.9 [1]	0.9 [1]	0.9 [1]	
Total U.S. Households	**5.32**	**39.67**	**0.46**	**11.33**	**1.83**	**16.99**	**0.46**	**11.98**	**1.94**	**43.95**	**1.6**
Census Region and Division											
Northeast	1.49	11.39	.04	1.39	.43	4.17	.08	2.66	.35	10.10	3.6
New England	.40	3.12	.01	.24	.11	1.17	.02	.64	.09	2.60	6.7
Middle Atlantic	1.09	8.27	.03	1.15	.32	3.00	.06	2.02	.26	7.51	4.2
Midwest	1.92	12.09	.08	1.90	.52	4.06	.11	2.59	.50	10.48	3.3
East North Central	1.41	8.69	.05	1.26	.39	2.84	.07	1.88	.35	7.55	4.0
West North Central	.52	3.40	.03	.64	.14	1.22	.03	.71	.15	2.93	4.7
South	1.21	11.09	.31	7.11	.51	5.89	.19	4.38	.73	15.19	2.8
South Atlantic	.56	5.83	.14	3.46	.22	3.20	.09	2.18	.34	7.71	4.0
East South Central	.25	2.19	.05	.97	.09	1.01	.04	.66	.14	2.38	5.0
West South Central	.40	3.08	.11	2.69	.20	1.68	.06	1.54	.25	5.10	5.3
West	.70	5.09	.03	.92	.36	2.87	.09	2.35	.37	8.18	3.8
Mountain	.28	1.73	.01	.37	.10	.81	.02	.55	.10	2.04	6.1
Pacific	.42	3.36	.02	.56	.26	2.06	.06	1.80	.26	6.13	4.9
Largest Populated States											
California	.27	2.07	.02	.53	.21	1.51	.04	1.47	.18	4.92	5.2
Florida	.05	.88	.06	1.44	.04	.89	.03	.78	.11	2.59	9.1
New York	.51	3.95	.01	.50	.16	1.51	.02	1.01	.12	3.76	7.6
Texas	.23	1.85	.07	1.65	.12	1.03	.04	.97	.15	3.19	7.4
Urban Status											
Urban	4.11	30.17	.36	9.18	1.50	13.02	.36	9.70	1.50	34.53	1.9
Central City	1.56	11.18	.13	3.19	.62	5.05	.13	3.73	.54	12.19	3.1
Suburban	2.54	19.00	.24	5.99	.88	7.97	.22	5.97	.96	22.34	2.3
Rural	1.21	9.49	.10	2.15	.33	3.97	.10	2.27	.45	9.41	4.2
Climate Zone [2]											
Under 2,000 CDD and Over 7,000 HDD	.69	4.39	.01	.26	.17	1.66	.03	.79	.18	3.80	21.6
5,500 to 7,000 HDD	2.11	14.28	.07	1.67	.59	4.89	.11	3.05	.54	12.05	9.7
4,000 to 5,499 HDD	1.35	10.77	.10	2.57	.44	4.20	.10	2.75	.44	10.22	9.3
Under 4,000 HDD	.60	5.03	.08	1.85	.31	2.84	.08	2.27	.32	7.72	12.5
2,000 CDD or More and Under 4,000 HDD	.57	5.20	.21	4.98	.31	3.41	.12	3.12	.46	10.16	7.6
Type of Housing Unit											
Single-Family	4.31	31.36	.37	8.87	1.33	12.09	.35	8.97	1.56	34.99	2.3
Detached	3.96	28.47	.33	7.92	1.19	10.82	.32	8.02	1.42	31.79	2.5
Attached	.36	2.89	.04	.95	.14	1.27	.03	.94	.14	3.19	9.1
Mobile Home	.22	1.93	.03	.82	.07	1.11	.02	.55	.11	2.30	9.8
Multifamily	.79	6.37	.06	1.63	.43	3.79	.08	2.46	.27	6.67	5.3
2 to 4 Units	.48	3.59	.02	.43	.17	1.43	.03	.86	.11	2.61	8.1
5 or More Units	.31	2.79	.04	1.20	.26	2.36	.06	1.61	.16	4.05	6.9
Heated Floorspace (square feet)											
Fewer than 1,000	.94	7.72	.08	2.04	.45	4.48	.11	3.00	.38	8.41	3.7
1,000 to 1,999	2.05	15.72	.21	5.03	.76	7.10	.19	5.02	.83	18.80	2.9
2,000 to 2,999	1.39	9.93	.11	2.61	.39	3.48	.10	2.53	.45	10.38	4.0
3,000 or More	.94	6.30	.07	1.64	.22	1.93	.06	1.42	.28	6.36	7.2

See footnotes at end of table.

Table 5.11. Total Consumption and Expenditures by End Uses in U.S. Households, 1993 (Continued)

Characteristics	Space Heating		Air Conditioning		Water Heating		Refrigerator		Appliances		RSE Row Factors
	Consumption (quadrillion Btu)	Expenditures (billion dollars)	Consumption (quadrillion Btu)	Expenditures (billion dollars)	Consumption (quadrillion Btu)	Expenditures (billion dollars)	Consumption (quadrillion Btu)	Expenditures (billion dollars)	Consumption (quadrillion Btu)	Expenditures (billion dollars)	
RSE Column Factors:	1.1 [1]	0.9 [1]	1.5 [1]	1.5 [1]	0.9 [1]	0.8 [1]	0.9 [1]	0.9 [1]	0.9 [1]	0.9 [1]	
Total Number of Rooms (Excluding Bathrooms)											
1 or 2	0.05	0.50	(*)	0.13	0.04	0.38	0.01	0.26	0.02	0.57	12.9
3 to 5	1.88	15.01	0.17	4.25	.79	7.71	.20	5.24	.74	16.68	2.9
6 to 8	2.79	20.20	.24	5.71	.85	7.66	.21	5.49	1.00	22.40	3.2
9 or More	.60	3.95	.05	1.25	.15	1.24	.04	.99	.19	4.30	9.4
Ownership of Unit											
Owned	4.10	30.04	.36	8.80	1.22	11.45	.33	8.52	1.48	33.25	2.2
Rented	1.22	9.62	.10	2.53	.60	5.54	.12	3.46	.47	10.70	3.6
Public Housing	.09	.77	.01	.18	.06	.51	.01	.30	.04	.82	12.5
Not Public Housing	1.13	8.85	.09	2.35	.55	5.02	.11	3.15	.43	9.88	4.1
Rent Subsidy	.08	.61	(*)	.11	.04	.31	.01	.19	.03	.59	12.0
No Rent Subsidy	1.06	8.25	.09	2.24	.51	4.72	.11	2.96	.40	9.28	4.3
Year of Construction											
1939 or Before	1.69	11.17	.04	1.11	.42	3.57	.09	2.36	.39	8.76	5.5
1940 to 1949	.45	3.04	.02	.50	.13	1.14	.03	.86	.14	3.01	8.5
1950 to 1959	.81	5.76	.06	1.53	.27	2.26	.07	1.85	.29	6.73	6.3
1960 to 1969	.82	6.03	.08	1.85	.29	2.45	.07	1.94	.29	6.62	5.8
1970 to 1979	.73	6.21	.10	2.32	.31	3.21	.09	2.26	.37	8.18	5.0
1980 to 1984	.26	2.54	.06	1.45	.14	1.56	.04	1.11	.17	3.89	6.5
1985 to 1987	.19	1.75	.04	1.05	.10	1.04	.03	.65	.11	2.56	9.2
1988 to 1990	.18	1.65	.03	.77	.08	.96	.02	.52	.11	2.33	8.3
1991 to 1993 [3]	.18	1.51	.03	.75	.08	.81	.02	.43	.09	1.87	11.0
All Utilities Paid by Household											
Yes	4.79	35.96	.44	10.66	1.55	14.97	.41	10.63	1.79	40.13	1.8
No	.53	3.70	.02	.67	.28	2.02	.04	1.35	.16	3.81	5.4
1993 Family Income											
Less than $5,000	.17	1.31	.01	.33	.07	.65	.02	.44	.06	1.30	10.2
$5,000 to $9,999	.48	3.80	.03	.69	.16	1.49	.04	1.17	.15	3.19	5.7
$10,000 to $14,999	.56	4.05	.03	.74	.19	1.76	.05	1.24	.18	3.90	5.0
$15,000 to $19,999	.54	3.84	.04	.91	.16	1.57	.04	1.10	.17	3.79	6.5
$20,000 to $24,999	.46	3.44	.04	.88	.15	1.43	.04	1.01	.16	3.58	5.6
$25,000 to $34,999	.77	5.86	.07	1.73	.25	2.50	.07	1.72	.29	6.47	4.9
$35,000 to $49,999	.97	7.17	.10	2.37	.36	3.36	.08	2.20	.39	8.97	4.1
$50,000 to $74,999	.77	5.68	.08	1.94	.28	2.50	.07	1.72	.31	7.01	5.0
$75,000 or More	.61	4.51	.07	1.74	.20	1.73	.05	1.38	.24	5.74	7.6
Below Poverty Line											
100 Percent	.63	4.84	.04	1.00	.27	2.50	.06	1.61	.24	5.23	4.9
125 Percent	.88	6.72	.06	1.39	.36	3.39	.08	2.18	.33	7.20	4.3
150 Percent	1.13	8.68	.08	1.92	.45	4.35	.11	2.81	.43	9.27	3.7
Eligible for Federal Assistance [4]	**1.50**	**11.32**	**.09**	**2.27**	**.55**	**5.19**	**.13**	**3.47**	**.51**	**11.37**	**3.6**
Age of Householder											
Under 25 Years	.20	1.63	.02	.49	.10	1.00	.02	.55	.08	1.80	9.7
25 to 34 Years	.94	7.06	.09	2.22	.41	3.83	.08	2.10	.38	8.43	3.8
35 to 44 Years	1.09	8.29	.12	2.88	.46	4.41	.10	2.63	.49	11.30	3.4
45 to 59 Years	1.28	9.51	.13	3.13	.45	4.21	.11	2.98	.51	11.39	4.0
60 Years and Over	1.81	13.17	.10	2.62	.39	3.54	.14	3.72	.48	11.03	3.6

See footnotes at end of table.

Table 5.11. Total Consumption and Expenditures by End Uses in U.S. Households, 1993 (Continued)

Characteristics	Space Heating		Air Conditioning		Water Heating		Refrigerator		Appliances		RSE Row Factors
	Consumption (quadrillion Btu)	Expenditures (billion dollars)	Consumption (quadrillion Btu)	Expenditures (billion dollars)	Consumption (quadrillion Btu)	Expenditures (billion dollars)	Consumption (quadrillion Btu)	Expenditures (billion dollars)	Consumption (quadrillion Btu)	Expenditures (billion dollars)	
RSE Column Factors:	1.1 [1]	0.9 [1]	1.5 [1]	1.5 [1]	0.9 [1]	0.8 [1]	0.9 [1]	0.9 [1]	0.9 [1]	0.9 [1]	
Education of Householder											
Less than 13 Years	2.78	20.64	0.21	5.00	0.95	9.02	0.24	6.24	1.00	22.26	2.5
13 to 16 Years	1.84	13.87	.18	4.61	.64	6.01	.16	4.24	.70	15.98	2.9
17 Years or More	.70	5.16	.07	1.72	.23	1.96	.06	1.50	.24	5.71	5.3
Race of Householder											
White	4.54	33.86	.40	9.80	1.46	13.91	.38	9.91	1.65	37.33	1.9
Black	.61	4.42	.05	1.10	.25	2.13	.05	1.41	.21	4.58	6.9
Other [5]	.17	1.39	.02	.43	.11	.95	.02	.66	.08	2.04	9.5
Householder of Hispanic Descent											
Yes	.28	2.16	.03	.72	.17	1.37	.03	.95	.14	3.21	9.1
No	5.04	37.51	.43	10.60	1.66	15.63	.42	11.02	1.81	40.73	1.9
Household Size											
1 Person	1.12	8.53	.07	1.79	.26	2.36	.09	2.54	.26	6.03	2.7
2 Persons	1.77	13.32	.16	3.78	.53	5.06	.16	4.09	.60	13.46	2.8
3 Persons	.96	7.09	.09	2.23	.37	3.43	.08	2.13	.38	8.60	4.5
4 Persons	.90	6.46	.08	2.08	.38	3.43	.07	1.86	.40	8.96	3.7
5 Persons	.38	2.83	.04	.96	.18	1.73	.03	.85	.20	4.36	6.6
6 or More Persons	.20	1.44	.02	.48	.11	.98	.02	.51	.11	2.53	11.0

[1] This factor is underestimated because it contains no error for estimating this end use.
[2] Climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[3] Does not include all new construction for 1993.
[4] Below 150 percent of poverty line or 60 percent of median State income.
[5] Includes some householders who described themselves as Hispanic rather than White, Black, or other.

Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • Consumption and Expenditure data are for major energy sources which include: electricity, natural gas, fuel oil, kerosene, and liquefied petroleum gas. • See ''Glossary'' for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A-H of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.12. Consumption by End Uses, per U.S. Household, 1993

Characteristics	All Uses		Space Heating		Air Conditioning		Water Heating		Refrigerator		Appliances		RSE Row Factors
	Households (million)	Consumption (million Btu)	Households (million)	Consumption (million Btu)	Households (million)	Consumption (million Btu)	Households (million)	Consumption (million Btu)	Households (million)	Consumption (million Btu)	Households (million)	Consumption (million Btu)	
RSE Column Factors:	1.1	0.8	1.1	1.1 [1]	1.3	1.3 [1]	1.1	0.8 [1]	1.1	0.7 [1]	1.1	0.7 [1]	
Total U.S. Households	**96.6**	**103.6**	**94.6**	**56.3**	**64.0**	**7.2**	**95.9**	**19.0**	**96.4**	**4.7**	**96.6**	**20.1**	**1.6**
Census Region and Division													
Northeast	19.5	122.4	19.1	77.7	10.9	3.7	19.3	22.2	19.4	3.9	19.5	18.1	3.9
New England	5.1	123.1	4.9	81.7	2.1	3.6	5.0	21.2	5.1	3.7	5.1	17.5	6.0
Middle Atlantic	14.4	122.1	14.2	76.3	8.8	3.7	14.3	22.6	14.3	3.9	14.4	18.3	4.4
Midwest	23.3	134.3	23.2	82.8	16.4	4.9	23.3	22.4	23.3	4.5	23.3	21.4	3.2
East North Central	16.4	138.8	16.3	86.3	10.8	4.7	16.4	23.6	16.4	4.5	16.4	21.5	3.6
West North Central	6.9	123.8	6.9	74.5	5.6	5.2	6.9	19.7	6.9	4.6	6.9	21.2	5.3
South	33.5	88.1	32.8	36.8	29.4	10.5	33.2	15.5	33.4	5.7	33.5	21.7	2.7
South Atlantic	17.3	78.0	16.8	33.1	15.0	9.6	17.1	12.7	17.3	5.2	17.3	19.7	3.6
East South Central	6.0	94.9	5.9	43.3	5.3	10.0	5.9	15.4	6.0	5.8	6.0	22.8	3.9
West South Central	10.1	101.1	10.1	39.1	9.2	12.1	10.1	20.1	10.1	6.3	10.1	24.6	5.3
West	20.4	76.0	19.4	36.2	7.2	4.4	20.2	17.9	20.3	4.2	20.4	18.0	4.4
Mountain	5.4	98.1	5.3	53.3	2.1	6.6	5.3	19.4	5.4	4.4	5.4	19.3	7.5
Pacific	15.0	68.2	14.1	29.8	5.1	3.5	14.9	17.4	15.0	4.2	15.0	17.5	5.3
Largest Populated States													
California	11.1	65.2	10.6	25.8	4.4	3.7	11.1	18.7	11.1	4.0	11.1	16.6	5.4
Florida	5.6	52.3	5.3	9.2	5.1	11.5	5.5	7.7	5.6	5.7	5.6	19.6	6.3
New York	6.8	121.2	6.7	76.2	3.9	2.9	6.7	24.1	6.8	3.5	6.8	17.1	6.9
Texas	6.4	94.7	6.4	35.1	5.8	12.0	6.4	18.7	6.4	6.3	6.4	24.0	7.4
Urban Status													
Urban	75.8	103.2	74.4	55.2	50.3	7.2	75.3	19.9	75.7	4.7	75.8	19.8	1.9
Central City	30.6	97.7	29.9	52.4	18.9	6.7	30.4	20.4	30.5	4.4	30.6	17.7	2.2
Suburban	45.2	107.0	44.6	57.1	31.3	7.5	44.9	19.5	45.1	4.9	45.2	21.2	1.7
Rural	20.8	104.9	20.2	60.1	13.7	7.1	20.6	15.9	20.8	4.8	20.8	21.5	3.0
Climate Zone [2]													
Under 2,000 CDD and Over 7,000 HDD	8.7	124.0	8.5	80.9	4.0	2.9	8.6	19.5	8.7	3.9	8.7	20.4	9.5
5,500 to 7,000 HDD	26.5	129.2	26.3	80.4	15.5	4.2	26.4	22.5	26.5	4.3	26.5	20.3	5.6
4,000 to 5,499 HDD	22.4	108.5	22.1	61.3	16.0	6.2	22.2	19.9	22.3	4.5	22.4	19.6	5.4
Under 4,000 HDD	17.8	78.5	17.2	35.0	10.3	7.5	17.7	17.5	17.8	4.6	17.8	18.3	6.8
2,000 CDD or More and Under 4,000 HDD	21.2	79.1	20.5	27.5	18.1	11.4	21.0	14.9	21.1	5.9	21.2	21.9	4.9
Type of Housing Unit													
Single-Family	66.8	118.6	65.5	65.9	45.1	8.1	66.3	20.0	66.7	5.2	66.8	23.4	1.6
Detached	59.5	121.3	58.3	67.9	39.9	8.2	59.0	20.1	59.4	5.3	59.5	23.9	1.7
Attached	7.3	96.3	7.2	49.6	5.2	7.2	7.3	19.0	7.3	4.7	7.3	18.8	6.9
Mobile Home	5.6	81.9	5.4	40.1	3.7	9.3	5.5	13.2	5.6	4.1	5.6	19.4	6.2
Multifamily	24.2	67.3	23.6	33.4	15.1	4.0	24.1	17.7	24.2	3.4	24.2	11.3	3.6
2 to 4 Units	8.0	99.5	7.9	60.3	3.9	3.8	8.0	21.0	8.0	3.5	8.0	13.9	5.8
5 or More Units	16.2	51.5	15.8	19.9	11.2	4.0	16.1	16.0	16.2	3.4	16.2	10.1	4.4
Heated Floorspace (square feet)													
Fewer than 1,000	29.3	66.8	28.1	33.4	17.2	4.7	28.9	15.6	29.2	3.8	29.3	12.8	2.6
1,000 to 1,999	40.2	100.7	39.6	51.8	27.4	7.5	40.0	19.1	40.1	4.8	40.2	20.7	2.1
2,000 to 2,999	17.8	136.6	17.7	78.8	12.8	8.4	17.8	21.7	17.8	5.5	17.8	25.3	2.8
3,000 or More	9.3	168.8	9.2	102.0	6.6	10.1	9.2	24.1	9.3	6.0	9.3	30.5	4.6
Total Number of Rooms (Excluding Bathrooms)													
1 or 2	3.2	41.3	3.0	18.2	1.6	3.0	3.1	13.5	3.2	2.8	3.2	7.1	8.3
3 to 5	47.3	79.7	46.2	40.7	30.4	5.6	47.0	16.7	47.2	4.1	47.3	15.6	2.1
6 to 8	40.2	126.3	39.7	70.3	27.7	8.5	40.0	21.2	40.2	5.3	40.2	24.8	2.1
9 or More	5.8	175.5	5.7	104.4	4.3	11.4	5.8	26.0	5.8	6.4	5.8	32.5	5.8

See footnotes at end of table.

Table 5.12. Consumption by End Uses, per U.S. Household, 1993 (Continued)

Characteristics	All Uses		Space Heating		Air Conditioning		Water Heating		Refrigerator		Appliances		RSE
	Households (million)	Consumption (million Btu)	Households (million)	Consumption (million Btu)	Households (million)	Consumption (million Btu)	Households (million)	Consumption (million Btu)	Households (million)	Consumption (million Btu)	Households (million)	Consumption (million Btu)	
RSE Column Factors:	1.1	0.8	1.1	1.1 [1]	1.3	1.3 [1]	1.1	0.8 [1]	1.1	0.7 [1]	1.1	0.7 [1]	Row Factors
Ownership of Unit													
Owned	63.2	118.6	62.0	66.1	44.3	8.2	62.9	19.4	63.2	5.2	63.2	23.4	1.6
Rented	33.4	75.2	32.6	37.5	19.7	5.0	33.1	18.3	33.3	3.8	33.4	14.0	2.5
Public Housing	3.4	58.2	3.4	25.3	2.2	3.2	3.4	16.6	3.4	3.4	3.4	11.3	9.5
Not Public Housing	30.0	77.2	29.2	38.9	17.5	5.2	29.7	18.5	29.8	3.8	30.0	14.3	2.9
Rent Subsidy	2.0	75.8	1.9	40.1	1.1	3.7	2.0	19.0	2.0	3.3	2.0	13.2	10.1
No Rent Subsidy	28.0	77.3	27.3	38.8	16.4	5.3	27.7	18.4	27.9	3.8	28.0	14.3	3.1
Year of Construction													
1939 or Before	20.3	129.6	19.7	85.7	9.9	4.5	20.1	21.2	20.3	4.2	20.3	19.0	3.6
1940 to 1949	6.9	112.0	6.8	66.5	3.8	5.3	6.9	19.5	6.9	4.7	6.9	19.8	5.2
1950 to 1959	13.1	114.1	12.8	63.3	8.4	6.8	13.0	20.8	13.1	5.1	13.1	21.9	4.1
1960 to 1969	15.0	102.9	14.7	56.0	10.6	7.1	14.9	19.1	15.0	4.8	15.0	19.2	3.9
1970 to 1979	18.1	87.9	17.7	41.5	12.4	7.9	18.0	17.1	18.1	5.0	18.1	20.1	3.7
1980 to 1984	8.5	80.3	8.3	31.3	6.7	8.9	8.5	16.7	8.5	5.2	8.5	20.6	4.5
1985 to 1987	5.5	85.2	5.5	34.6	4.7	9.1	5.5	17.4	5.5	4.7	5.5	20.8	6.6
1988 to 1990	4.7	90.4	4.6	39.3	3.8	8.4	4.7	17.9	4.7	4.5	4.7	22.6	5.8
1991 to 1993 [3]	4.5	88.9	4.5	40.1	3.8	8.4	4.5	18.4	4.5	3.9	4.5	19.4	8.5
All Utilities Paid by Household													
Yes	82.9	108.3	81.3	58.9	56.4	7.7	82.5	18.7	82.8	5.0	82.9	21.6	1.8
No	13.7	75.5	13.3	39.9	7.6	3.1	13.5	20.8	13.6	3.1	13.7	11.5	3.9
1993 Family Income													
Less than $5,000	4.0	80.1	4.0	42.8	2.4	5.2	4.0	17.3	4.0	4.0	4.0	14.2	6.7
$5,000 to $9,999	10.6	81.7	10.2	47.1	6.1	4.7	10.3	15.7	10.5	4.2	10.6	13.8	4.2
$10,000 to $14,999	11.1	89.7	10.8	51.4	6.3	4.7	11.1	17.0	11.1	4.2	11.1	15.9	3.7
$15,000 to $19,999	9.6	99.2	9.3	57.6	6.0	6.2	9.6	17.0	9.6	4.5	9.6	18.0	4.3
$20,000 to $24,999	8.7	96.6	8.6	53.3	5.5	6.4	8.7	17.0	8.7	4.5	8.7	18.7	3.8
$25,000 to $34,999	14.1	103.5	13.8	55.7	9.7	7.4	14.0	18.1	14.0	4.9	14.1	20.6	3.4
$35,000 to $49,999	17.5	108.5	17.1	56.6	12.4	7.8	17.4	20.6	17.4	4.8	17.5	22.3	2.9
$50,000 to $74,999	12.6	119.2	12.4	62.0	9.1	8.9	12.6	22.3	12.6	5.2	12.6	24.4	3.3
$75,000 or More	8.3	139.9	8.2	73.6	6.5	10.2	8.3	24.6	8.3	6.0	8.3	28.8	5.0
Below Poverty Line													
100 Percent	14.4	85.9	13.9	45.2	7.9	5.1	14.1	19.1	14.3	4.2	14.4	16.7	3.7
125 Percent	19.4	87.9	18.7	46.8	11.0	5.1	19.0	18.8	19.3	4.2	19.4	17.0	3.2
150 Percent	24.7	88.8	23.9	47.2	14.4	5.5	24.4	18.7	24.6	4.3	24.7	17.2	2.8
Eligible for Federal Assistance [4]	**30.6**	**90.9**	**29.7**	**50.4**	**17.7**	**5.2**	**30.3**	**18.1**	**30.6**	**4.3**	**30.6**	**16.8**	**2.5**
Age of Householder													
Under 25 Years	5.7	75.4	5.6	36.6	3.2	6.1	5.6	18.2	5.7	3.8	5.7	14.6	6.5
25 to 34 Years	19.9	95.4	19.5	48.2	13.3	6.7	19.8	20.8	19.9	4.0	19.9	19.0	2.7
35 to 44 Years	21.4	105.9	21.0	51.9	14.2	8.3	21.3	21.8	21.3	4.7	21.4	23.1	2.4
45 to 59 Years	21.9	113.5	21.3	59.9	14.7	8.7	21.7	20.8	21.9	5.2	21.9	23.3	2.8
60 Years and Over	27.7	105.7	27.3	66.5	18.5	5.6	27.5	14.4	27.7	5.0	27.7	17.3	2.5
Education of Householder													
Less than 13 Years	51.5	100.7	50.2	55.4	32.5	6.4	51.0	18.7	51.4	4.7	51.5	19.5	1.8
13 to 16 Years	33.6	105.0	33.1	55.6	23.3	7.9	33.4	19.2	33.6	4.8	33.6	20.8	2.2
17 Years or More	11.5	112.4	11.3	62.0	8.2	8.3	11.5	20.0	11.5	4.8	11.5	20.9	4.1
Race of Householder													
White	80.2	105.3	78.8	57.6	54.5	7.3	79.7	18.4	80.1	4.8	80.2	20.6	1.8
Black	10.9	106.8	10.7	56.6	6.7	6.7	10.8	23.5	10.9	4.7	10.9	18.9	5.0
Other [5]	5.5	72.7	5.0	34.1	2.8	5.9	5.5	20.1	5.5	4.0	5.5	15.3	6.2

See footnotes at end of table.

Table 5.12. Consumption by End Uses, per U.S. Household, 1993 (Continued)

Characteristics	All Uses		Space Heating		Air Conditioning		Water Heating		Refrigerator		Appliances		RSE
	Households (million)	Consumption (million Btu)	Households (million)	Consumption (million Btu)	Households (million)	Consumption (million Btu)	Households (million)	Consumption (million Btu)	Households (million)	Consumption (million Btu)	Households (million)	Consumption (million Btu)	
RSE Column Factors:	1.1	0.8	1.1	1.1 [1]	1.3	1.3 [1]	1.1	0.8 [1]	1.1	0.7 [1]	1.1	0.7 [1]	Row Factors
Householder of Hispanic Descent													
Yes	7.9	81.2	7.4	37.6	4.3	6.4	7.8	21.2	7.9	4.1	7.9	17.2	5.8
No	88.7	105.6	87.1	57.8	59.7	7.2	88.2	18.8	88.6	4.8	88.7	20.4	1.7
Household Size													
1 Person	23.5	76.8	23.0	48.6	15.0	4.8	23.1	11.3	23.4	4.0	23.5	11.0	3.0
2 Persons	31.7	101.3	31.2	56.7	21.9	7.1	31.6	16.7	31.7	5.0	31.7	19.0	2.1
3 Persons	16.6	112.9	16.3	59.0	11.1	8.2	16.5	22.2	16.6	4.8	16.6	22.8	2.9
4 Persons	14.6	125.2	14.4	62.2	9.9	8.5	14.6	25.9	14.6	4.9	14.6	27.3	2.6
5 Persons	6.8	122.3	6.5	57.6	4.3	9.2	6.7	26.9	6.8	4.9	6.8	29.0	4.2
6 or More Persons	3.5	133.9	3.2	63.5	1.9	9.8	3.5	32.6	3.5	5.3	3.5	32.5	7.1

[1] This factor is underestimated because it contains no error for estimating this end use.
[2] Climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[3] Does not include all new construction for 1993.
[4] Below 150 percent of poverty line or 60 percent of median State income.
[5] Includes some householders who described themselves as Hispanic rather than White, Black, or other.

Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • Consumption and Expenditure data are for major energy sources which include: electricity, natural gas, fuel oil, kerosene, and liquefied petroleum gas. • See ''Glossary'' for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A-H of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.13. Expenditures by End Uses, per U.S. Household, 1993

Characteristics	All Uses		Space Heating		Air Conditioning		Water Heating		Refrigerators		Appliances		RSE Row Factors
	Households (million)	Expenditures (dollars)	Households (million)	Expenditures (dollars)	Households (million)	Expenditures (dollars)	Households (million)	Expenditures (dollars)	Households (million)	Expenditures (dollars)	Households (million)	Expenditures (dollars)	
RSE Column Factors:	1.2	0.6	1.1	0.9 [1]	1.4	1.4 [1]	1.2	0.6 [1]	1.2	0.8 [1]	1.2	0.8 [1]	
Total U.S. Households	**96.6**	**1,283**	**94.6**	**419**	**64.0**	**177**	**95.9**	**177**	**96.4**	**124**	**96.6**	**455**	**1.6**
Census Region and Division													
Northeast	19.5	1,526	19.1	595	10.9	127	19.3	216	19.4	137	19.5	519	3.7
New England	5.1	1,532	4.9	634	2.1	111	5.0	234	5.1	126	5.1	512	4.9
Middle Atlantic	14.4	1,523	14.2	582	8.8	131	14.3	210	14.3	141	14.4	521	4.3
Midwest	23.3	1,336	23.2	521	16.4	116	23.3	174	23.3	111	23.3	450	3.2
East North Central	16.4	1,358	16.3	533	10.8	117	16.4	174	16.4	115	16.4	461	4.2
West North Central	6.9	1,282	6.9	492	5.6	114	6.9	176	6.9	103	6.9	422	4.2
South	33.5	1,305	32.8	338	29.4	242	33.2	178	33.4	131	33.5	454	2.5
South Atlantic	17.3	1,292	16.8	346	15.0	231	17.1	187	17.3	126	17.3	445	3.7
East South Central	6.0	1,200	5.9	373	5.3	185	5.9	170	6.0	110	6.0	396	3.8
West South Central	10.1	1,391	10.1	304	9.2	291	10.1	167	10.1	152	10.1	504	4.6
West	20.4	953	19.4	263	7.2	128	20.2	142	20.3	116	20.4	402	4.0
Mountain	5.4	1,025	5.3	327	2.1	175	5.3	151	5.4	102	5.4	382	6.5
Pacific	15.0	928	14.1	238	5.1	109	14.9	139	15.0	120	15.0	409	5.0
Largest Populated States													
California	11.1	944	10.6	195	4.4	120	11.1	136	11.1	132	11.1	442	5.5
Florida	5.6	1,182	5.3	165	5.1	281	5.5	162	5.6	141	5.6	466	5.9
New York	6.8	1,577	6.7	590	3.9	128	6.7	224	6.8	149	6.8	552	6.5
Texas	6.4	1,349	6.4	288	5.8	287	6.4	161	6.4	151	6.4	494	6.7
Urban Status													
Urban	75.8	1,275	74.4	405	50.3	183	75.3	173	75.7	128	75.8	456	1.8
Central City	30.6	1,156	29.9	374	18.9	168	30.4	166	30.5	122	30.6	399	2.0
Suburban	45.2	1,356	44.6	426	31.3	191	44.9	177	45.1	132	45.2	494	1.6
Rural	20.8	1,312	20.2	471	13.7	157	20.6	193	20.8	110	20.8	452	2.8
Climate Zone [2]													
Under 2,000 CDD and Over 7,000 HDD	8.7	1,254	8.5	517	4.0	64	8.6	193	8.7	91	8.7	437	9.3
5,500 to 7,000 HDD	26.5	1,356	26.3	543	15.5	108	26.4	185	26.5	115	26.5	455	5.2
4,000 to 5,499 HDD	22.4	1,361	22.1	488	16.0	160	22.2	189	22.3	123	22.4	456	5.8
Under 4,000 HDD	17.8	1,107	17.2	292	10.3	179	17.7	160	17.8	128	17.8	434	5.7
2,000 CDD or More and Under 4,000 HDD	21.2	1,268	20.5	253	18.1	275	21.0	162	21.1	147	21.2	479	4.4
Type of Housing Unit													
Single-Family	66.8	1,442	65.5	479	45.1	197	66.3	182	66.7	134	66.8	524	1.5
Detached	59.5	1,464	58.3	488	39.9	198	59.0	183	59.4	135	59.5	535	1.7
Attached	7.3	1,266	7.2	403	5.2	183	7.3	174	7.3	129	7.3	437	6.1
Mobile Home	5.6	1,203	5.4	357	3.7	221	5.5	200	5.6	99	5.6	412	5.9
Multifamily	24.2	863	23.6	269	15.1	108	24.1	158	24.2	102	24.2	275	3.2
2 to 4 Units	8.0	1,112	7.9	454	3.9	110	8.0	179	8.0	107	8.0	326	5.1
5 or More Units	16.2	740	15.8	177	11.2	107	16.1	147	16.2	99	16.2	250	4.1
Heated Floorspace (square feet)													
Fewer than 1,000	29.3	876	28.1	275	17.2	119	28.9	155	29.2	103	29.3	287	2.5
1,000 to 1,999	40.2	1,286	39.6	397	27.4	183	40.0	178	40.1	125	40.2	468	2.0
2,000 to 2,999	17.8	1,622	17.7	561	12.8	205	17.8	196	17.8	142	17.8	582	2.7
3,000 or More	9.3	1,901	9.2	685	6.6	249	9.2	208	9.3	153	9.3	685	4.7
Total Number of Rooms (Excluding Bathrooms)													
1 or 2	3.2	574	3.0	166	1.6	82	3.1	122	3.2	83	3.2	178	8.1
3 to 5	47.3	1,033	46.2	325	30.4	140	47.0	164	47.2	111	47.3	352	1.9
6 to 8	40.2	1,529	39.7	509	27.7	206	40.0	191	40.2	137	40.2	557	2.1
9 or More	5.8	2,008	5.7	691	4.3	290	5.8	214	5.8	169	5.8	736	6.2

See footnotes at end of table.

Table 5.13. Expenditures by End Uses, per U.S. Household, 1993 (Continued)

Characteristics	All Uses		Space Heating		Air Conditioning		Water Heating		Refrigerators		Appliances		RSE Row Factors
	Households (million)	Expenditures (dollars)	Households (million)	Expenditures (dollars)	Households (million)	Expenditures (dollars)	Households (million)	Expenditures (dollars)	Households (million)	Expenditures (dollars)	Households (million)	Expenditures (dollars)	
RSE Column Factors:	1.2	0.6	1.1	0.9 [1]	1.4	1.4 [1]	1.2	0.6 [1]	1.2	0.8 [1]	1.2	0.8 [1]	
Ownership of Unit													
Owned	63.2	1,458	62.0	484	44.3	199	62.9	182	63.2	135	63.2	526	1.5
Rented	33.4	953	32.6	296	19.7	128	33.1	167	33.3	104	33.4	320	2.5
Public Housing	3.4	753	3.4	228	2.2	79	3.4	151	3.4	89	3.4	239	8.9
Not Public Housing	30.0	976	29.2	303	17.5	134	29.7	169	29.8	106	30.0	329	2.8
Rent Subsidy	2.0	905	1.9	317	1.1	97	2.0	155	2.0	97	2.0	299	9.3
No Rent Subsidy	28.0	981	27.3	303	16.4	137	27.7	170	27.9	106	28.0	332	3.0
Year of Construction													
1939 or Before	20.3	1,327	19.7	566	9.9	112	20.1	178	20.3	116	20.3	431	3.6
1940 to 1949	6.9	1,242	6.8	450	3.8	132	6.9	166	6.9	126	6.9	437	5.2
1950 to 1959	13.1	1,387	12.8	450	8.4	182	13.0	173	13.1	142	13.1	515	4.3
1960 to 1969	15.0	1,257	14.7	410	10.6	175	14.9	164	15.0	129	15.0	441	3.7
1970 to 1979	18.1	1,222	17.7	352	12.4	188	18.0	179	18.1	125	18.1	451	3.3
1980 to 1984	8.5	1,247	8.3	306	6.7	217	8.5	184	8.5	131	8.5	460	4.3
1985 to 1987	5.5	1,284	5.5	320	4.7	223	5.5	190	5.5	118	5.5	466	6.0
1988 to 1990	4.7	1,322	4.6	356	3.8	201	4.7	204	4.7	111	4.7	494	5.5
1991 to 1993 [3]	4.5	1,200	4.5	338	3.8	197	4.5	180	4.5	96	4.5	419	7.7
All Utilities Paid by Household													
Yes	82.9	1,356	81.3	442	56.4	189	82.5	182	82.8	128	82.9	484	1.6
No	13.7	843	13.3	278	7.6	88	13.5	150	13.6	99	13.7	278	3.8
1993 Family Income													
Less than $5,000	4.0	994	4.0	330	2.4	134	4.0	164	4.0	110	4.0	321	6.1
$5,000 to $9,999	10.6	980	10.2	372	6.1	113	10.3	144	10.5	111	10.6	302	4.1
$10,000 to $14,999	11.1	1,051	10.8	374	6.3	118	11.1	159	11.1	112	11.1	350	3.5
$15,000 to $19,999	9.6	1,163	9.3	410	6.0	151	9.6	164	9.6	114	9.6	394	3.9
$20,000 to $24,999	8.7	1,182	8.6	401	5.5	159	8.7	164	8.7	115	8.7	409	3.6
$25,000 to $34,999	14.1	1,302	13.8	423	9.7	179	14.0	178	14.0	123	14.1	461	3.1
$35,000 to $49,999	17.5	1,379	17.1	419	12.4	191	17.4	193	17.4	126	17.5	514	2.7
$50,000 to $74,999	12.6	1,493	12.4	457	9.1	214	12.6	199	12.6	136	12.6	555	2.9
$75,000 or More	8.3	1,809	8.2	546	6.5	269	8.3	209	8.3	166	8.3	687	4.8
Below Poverty Line													
100 Percent	14.4	1,056	13.9	349	7.9	127	14.1	178	14.3	112	14.4	364	3.5
125 Percent	19.4	1,078	18.7	359	11.0	126	19.0	178	19.3	113	19.4	372	3.0
150 Percent	24.7	1,094	23.9	363	14.4	133	24.4	179	24.6	114	24.7	375	2.6
Eligible for Federal Assistance [4]	**30.6**	**1,098**	**29.7**	**381**	**17.7**	**128**	**30.3**	**172**	**30.6**	**114**	**30.6**	**371**	**2.2**
Age of Householder													
Under 25 Years	5.7	956	5.6	293	3.2	150	5.6	177	5.7	97	5.7	315	5.8
25 to 34 Years	19.9	1,187	19.5	363	13.3	167	19.8	193	19.9	106	19.9	423	2.5
35 to 44 Years	21.4	1,380	21.0	395	14.2	202	21.3	207	21.3	123	21.4	528	2.2
45 to 59 Years	21.9	1,429	21.3	446	14.7	212	21.7	194	21.9	136	21.9	521	2.7
60 Years and Over	27.7	1,229	27.3	483	18.5	142	27.5	129	27.7	134	27.7	398	2.3
Education of Householder													
Less than 13 Years	51.5	1,227	50.2	411	32.5	154	51.0	177	51.4	121	51.5	432	1.7
13 to 16 Years	33.6	1,330	33.1	419	23.3	198	33.4	180	33.6	126	33.6	476	2.0
17 Years or More	11.5	1,394	11.3	456	8.2	210	11.5	171	11.5	130	11.5	496	3.8
Race of Householder													
White	80.2	1,307	78.8	429	54.5	180	79.7	175	80.1	124	80.2	466	1.8
Black	10.9	1,252	10.7	411	6.7	163	10.8	198	10.9	129	10.9	420	4.6
Other [5]	5.5	988	5.0	277	2.8	154	5.5	173	5.5	120	5.5	369	5.9

See footnotes at end of table.

Table 5.13. Expenditures by End Uses, per U.S. Household, 1993 (Continued)

Characteristics	All Uses		Space Heating		Air Conditioning		Water Heating		Refrigerators		Appliances		RSE Row Factors
	Households (million)	Expenditures (dollars)	Households (million)	Expenditures (dollars)	Households (million)	Expenditures (dollars)	Households (million)	Expenditures (dollars)	Households (million)	Expenditures (dollars)	Households (million)	Expenditures (dollars)	
RSE Column Factors:	1.2	0.6	1.1	0.9 [1]	1.4	1.4 [1]	1.2	0.6 [1]	1.2	0.8 [1]	1.2	0.8 [1]	
Householder of Hispanic Descent													
Yes	7.9	1,065	7.4	290	4.3	169	7.8	175	7.9	121	7.9	407	5.3
No	88.7	1,302	87.1	430	59.7	178	88.2	177	88.6	124	88.7	459	1.7
Household Size													
1 Person	23.5	906	23.0	371	15.0	120	23.1	102	23.4	109	23.5	257	2.7
2 Persons	31.7	1,253	31.2	427	21.9	173	31.6	160	31.7	129	31.7	425	2.0
3 Persons	16.6	1,416	16.3	436	11.1	201	16.5	208	16.6	128	16.6	519	2.7
4 Persons	14.6	1,561	14.4	448	9.9	211	14.6	235	14.6	127	14.6	614	2.5
5 Persons	6.8	1,588	6.5	433	4.3	226	6.7	257	6.8	126	6.8	645	4.0
6 or More Persons	3.5	1,708	3.2	449	1.9	249	3.5	285	3.5	147	3.5	728	7.6

[1] This factor is underestimated because it contains no error for estimating this end use.
[2] Climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[3] Does not include all new construction for 1993.
[4] Below 150 percent of poverty line or 60 percent of median State income.
[5] Includes some householders who described themselves as Hispanic rather than White, Black, or other.

Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • Consumption and Expenditure data are for major energy sources which include: electricity, natural gas, fuel oil, kerosene, and liquefied petroleum gas. • See ''Glossary'' for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A-H of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.14. Total Electricity and Natural Gas Consumption and Expenditures for Space Heating in U.S. Households, 1993

Characteristics	Electricity				Natural Gas				RSE Row Factors
		Total Consumed				Total Consumed			
	Households (million)	(quadrillion Btu)	(billion kWh)	Total Expenditures (billion dollars)	Households (million)	(quadrillion Btu)	(billion cubic feet)	Total Expenditures (billion dollars)	
RSE Column Factors:	0.9	1.3 [1]	1.3 [1]	1.2 [1]	0.7	0.9 [1]	0.9 [1]	0.9 [1]	
Total U.S. Households	**37.1**	**0.41**	**119**	**8.66**	**52.6**	**3.67**	**3,570**	**21.95**	**4.3**
Census Region and Division									
Northeast	4.1	.04	12	1.13	9.5	.78	754	5.82	11.9
New England	1.0	.01	3	.30	1.6	.13	123	1.05	19.3
Middle Atlantic	3.1	.03	9	.83	7.9	.65	631	4.78	14.2
Midwest	5.8	.07	22	1.54	17.0	1.56	1,519	8.40	11.1
East North Central	3.5	.04	13	.95	13.0	1.20	1,167	6.49	10.9
West North Central	2.4	.03	9	.59	4.1	.36	351	1.91	26.0
South	18.8	.21	61	4.42	13.6	.78	757	4.75	6.4
South Atlantic	10.7	.11	31	2.41	4.9	.29	280	2.03	8.6
East South Central	3.4	.05	15	.88	2.4	.16	160	.93	18.0
West South Central	4.8	.05	15	1.12	6.3	.33	317	1.79	10.6
West	8.3	.08	25	1.57	12.4	.56	541	2.99	6.3
Mountain	2.0	.02	6	.39	3.5	.23	227	1.10	8.9
Pacific	6.3	.06	19	1.18	9.0	.32	314	1.89	8.2
Largest Populated States									
California	3.9	.02	5	.50	8.1	.25	245	1.51	6.7
Florida	4.7	.03	8	.67	Q	Q	Q	Q	9.7
New York	1.1	Q	Q	Q	3.6	.29	282	2.33	26.8
Texas	3.2	.03	10	.75	3.7	.18	176	.99	16.2
Urban Status									
Urban	28.3	.28	82	6.21	45.1	3.06	2,973	18.56	4.5
Central City	10.8	.09	25	1.93	19.7	1.30	1,265	8.10	7.2
Suburban	17.6	.19	57	4.28	25.4	1.76	1,708	10.46	5.1
Rural	8.8	.13	38	2.45	7.5	.61	597	3.40	12.4
Climate Zone [2]									
Under 2,000 CDD and Over 7,000 HDD	2.3	.03	8	.44	4.4	.40	393	2.19	17.6
5,500 to 7,000 HDD	6.9	.10	28	2.06	17.7	1.59	1,544	9.19	14.0
4,000 to 5,499 HDD	8.6	.12	36	2.50	10.5	.81	792	5.37	11.6
Under 4,000 HDD	7.5	.06	18	1.45	10.6	.45	437	2.77	15.8
2,000 CDD or More and Under 4,000 HDD	11.8	.10	28	2.21	9.3	.41	403	2.43	9.9
Total Number of Rooms (Excluding Bathrooms)									
1 or 2	1.2	.01	2	.18	1.6	.04	35	.25	18.7
3 to 5	19.5	.19	57	4.18	23.4	1.26	1,222	7.65	5.6
6 to 8	14.6	.19	54	3.89	23.9	1.95	1,896	11.55	5.5
9 or More	1.8	.02	6	.42	3.7	.43	417	2.51	14.0
Type of Housing Unit									
Single-Family	24.3	.30	88	6.23	38.8	2.99	2,906	17.63	4.8
Detached	21.2	.26	77	5.41	34.5	2.72	2,645	15.89	5.2
Attached	3.1	.04	11	.82	4.3	.27	262	1.74	14.8
Mobile Home	2.1	.03	8	.58	1.8	.10	97	.56	17.8
Multifamily	10.7	.08	23	1.85	12.0	.58	567	3.77	8.1
2 to 4 Units	2.8	.03	8	.66	4.8	.37	361	2.42	12.8
5 or More Units	7.9	.05	15	1.19	7.2	.21	206	1.35	10.1
Heated Floorspace (square feet)									
Fewer than 1,000	11.9	.10	31	2.29	14.1	.63	618	3.93	5.6
1,000 to 1,999	16.2	.18	54	3.90	22.4	1.44	1,397	8.63	5.7
2,000 to 2,999	6.0	.08	23	1.67	10.5	.95	924	5.64	6.7
3,000 or More	2.9	.04	11	.79	5.6	.65	632	3.76	10.1

See footnotes at end of table.

Table 5.14. Total Electricity and Natural Gas Consumption and Expenditures for Space Heating in U.S. Households, 1993 (Continued)

Characteristics	Electricity				Natural Gas				RSE Row Factors
		Total Consumed				Total Consumed			
	Households (million)	(quadrillion Btu)	(billion kWh)	Total Expenditures (billion dollars)	Households (million)	(quadrillion Btu)	(billion cubic feet)	Total Expenditures (billion dollars)	
RSE Column Factors:	0.9	1.3 [1]	1.3 [1]	1.2 [1]	0.7	0.9 [1]	0.9 [1]	0.9 [1]	
Ownership of Unit									
Owned	23.1	0.28	83	5.93	35.3	2.80	2,720	16.60	4.7
Rented	14.0	.12	36	2.73	17.3	.87	851	5.36	6.2
Public Housing	1.6	.01	4	.33	1.7	.07	63	.41	18.6
Not Public Housing	12.4	.11	32	2.40	15.5	.81	787	4.95	6.8
Rent Subsidy	.8	.01	2	.17	1.0	.06	54	.35	17.5
No Rent Subsidy	11.6	.10	30	2.23	14.5	.75	733	4.60	7.0
Year of Construction									
1939 or Before	4.8	.03	10	.68	12.9	1.15	1,123	6.98	9.3
1940 to 1949	1.8	.02	5	.31	4.4	.31	301	1.87	13.6
1950 to 1959	3.9	.04	10	.79	8.4	.58	568	3.59	9.0
1960 to 1969	5.3	.06	17	1.25	9.2	.63	612	3.73	9.0
1970 to 1979	8.8	.12	34	2.43	7.8	.45	442	2.56	8.0
1980 to 1984	4.8	.06	17	1.27	3.6	.17	166	1.02	10.0
1985 to 1987	3.2	.03	10	.74	2.3	.13	122	.76	11.7
1988 to 1990	2.5	.03	9	.69	1.9	.12	114	.68	12.6
1991 to 1993 [3]	2.1	.02	7	.50	2.1	.13	124	.77	15.7
Electric Space-Heating Paid by Household	**35.3**	**.39**	**114**	**8.24**	--	--	--	--	**5.7**
Natural Gas Space-Heating Paid by Household	--	--	--	--	**45.1**	**3.29**	**3,202**	**19.64**	**6.0**
1993 Family Income									
Less than $5,000	1.6	.01	4	.29	2.1	.12	113	.72	14.6
$5,000 to $9,999	4.1	.04	13	.99	5.4	.33	321	1.99	8.8
$10,000 to $14,999	4.2	.04	11	.79	6.2	.41	395	2.42	9.1
$15,000 to $19,999	3.7	.04	10	.71	5.3	.38	372	2.23	11.1
$20,000 to $24,999	3.5	.04	12	.79	4.6	.31	301	1.85	9.6
$25,000 to $34,999	5.4	.06	19	1.37	7.2	.50	484	2.95	7.9
$35,000 to $49,999	6.6	.07	22	1.55	9.5	.66	638	3.94	6.5
$50,000 to $74,999	5.0	.06	18	1.27	7.2	.53	513	3.11	7.6
$75,000 or More	3.1	.04	12	.90	5.2	.45	433	2.74	10.2
Below Poverty Line									
100 Percent	5.5	.05	15	1.12	7.4	.44	425	2.66	8.8
125 Percent	7.3	.07	21	1.53	9.8	.60	587	3.67	7.8
150 Percent	9.7	.09	28	2.07	12.5	.78	763	4.73	7.2
Eligible for Federal Assistance [4]	**11.7**	**.11**	**34**	**2.51**	**16.0**	**1.05**	**1,022**	**6.34**	**6.7**
Age of Householder									
Under 25 Years	2.8	.02	7	.54	2.6	.15	146	.87	14.5
25 to 34 Years	7.8	.08	23	1.73	11.1	.69	667	4.09	6.2
35 to 44 Years	8.1	.09	27	1.95	11.7	.76	736	4.58	6.3
45 to 59 Years	8.1	.10	29	2.06	11.8	.85	830	5.06	6.5
60 Years and Over	10.2	.11	33	2.38	15.4	1.23	1,192	7.35	6.4
Education of Householder									
Less than 13 Years	18.2	.21	60	4.34	27.3	1.87	1,823	11.16	5.3
13 to 16 Years	14.0	.15	45	3.30	18.2	1.28	1,245	7.62	5.6
17 Years or More	5.0	.05	14	1.02	7.1	.52	503	3.17	7.7

See footnotes at end of table.

Table 5.14. Total Electricity and Natural Gas Consumption and Expenditures for Space Heating in U.S. Households, 1993 (Continued)

Characteristics	Electricity				Natural Gas				RSE Row Factors
		Total Consumed				Total Consumed			
	Households (million)	(quadrillion Btu)	(billion kWh)	Total Expenditures (billion dollars)	Households (million)	(quadrillion Btu)	(billion cubic feet)	Total Expenditures (billion dollars)	
RSE Column Factors:	0.9	1.3 [1]	1.3 [1]	1.2 [1]	0.7	0.9 [1]	0.9 [1]	0.9 [1]	
Race of Householder									
White	31.1	0.36	105	7.47	42.7	3.04	2,957	18.02	4.8
Black	3.8	.03	10	.77	6.8	.50	487	3.11	10.1
Other [5]	2.2	.02	5	.41	3.1	.13	127	.82	12.0
Householder of Hispanic Descent									
Yes	2.9	.02	6	.54	4.1	.19	190	1.21	11.8
No	34.2	.38	113	8.12	48.4	3.48	3,381	20.75	4.5
Household Size									
1 Person	9.5	.10	28	2.13	12.4	.78	762	4.68	6.1
2 Persons	12.7	.15	43	3.10	16.9	1.18	1,152	7.01	5.6
3 Persons	5.8	.06	18	1.29	9.4	.66	645	4.08	7.4
4 Persons	5.3	.06	17	1.22	8.5	.65	630	3.85	6.2
5 Persons	2.7	.03	9	.67	3.5	.25	241	1.46	9.5
6 or More Persons	1.1	.01	4	.25	1.9	.14	141	.86	14.4

[1] This factor is underestimated because it contains no error for estimating this end use.
[2] Climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[3] Does not include all new construction for 1993.
[4] Below 150 percent of poverty line or 60 percent of median State income.
[5] Includes some householders who described themselves as Hispanic rather than White, Black, or other.
-- = Not applicable.
Q = Data withheld either because the Relative Standard Error (RSE) was greater than 50 percent or fewer than 10 households were sampled.
Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • See ''Glossary'' for definition of terms used in this report.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A, B, C, E, and F of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.15. Total Fuel Oil, Kerosene, and LPG Consumption and Expenditures for Space Heating in U.S. Households, 1993

Characteristics	Fuel Oil				Kerosene				Liquefied Petroleum Gas				RSE Row Factors
		Total Consumed				Total Consumed				Total Consumed			
	Households (million)	(quadrillion Btu)	(billion gallons)	Total Expenditures (billion dollars)	Households (million)	(quadrillion Btu)	(billion gallons)	Total Expenditures (billion dollars)	Households (million)	(quadrillion Btu)	(billion gallons)	Total Expenditures (billion dollars)	
RSE Column Factors:	0.6	0.7 [1]	0.7 [1]	0.7 [1]	1.1	1.5 [1]	1.5 [1]	1.5 [1]	0.9	1.1 [1]	1.1 [1]	1.0 [1]	
Total U.S. Households	**10.7**	**0.90**	**6.51**	**5.88**	**3.6**	**0.05**	**0.34**	**0.37**	**5.6**	**0.30**	**3.25**	**2.81**	**11.2**
Census Region and Division													
Northeast	7.3	.64	4.62	4.15	.7	.02	.14	.15	.3	.01	.13	.14	20.8
New England	2.6	.25	1.81	1.63	.2	Q	Q	Q	.2	Q	Q	Q	19.3
Middle Atlantic	4.7	.39	2.81	2.52	.5	.01	.08	.08	.1	Q	Q	Q	24.4
Midwest	1.4	.13	.91	.78	1.0	Q	Q	.05	1.9	.16	1.72	1.33	24.5
East North Central	.7	.07	.51	.44	.9	Q	Q	Q	1.0	.09	.98	.76	32.2
West North Central	.6	.06	.41	.34	.1	Q	Q	Q	.9	.07	.74	.56	29.9
South	1.5	.10	.74	.71	1.8	.02	.15	.16	2.8	.10	1.09	1.05	17.3
South Atlantic	1.4	.10	.70	.67	1.4	.02	.13	.14	1.4	.05	.55	.57	21.3
East South Central	Q	Q	Q	Q	.3	Q	Q	Q	.8	.03	.34	.31	26.0
West South Central	NC	NC	NC	NC	Q	Q	Q	Q	.6	.02	.20	.17	30.1
West	.5	.03	.23	.23	Q	Q	Q	Q	.6	.03	.31	.29	39.3
Mountain	Q	Q	Q	Q	Q	Q	Q	Q	.4	.02	.24	.20	34.2
Pacific	Q	.03	.19	.19	Q	Q	Q	Q	.2	Q	Q	Q	48.6
Largest Populated States													
California	Q	Q	Q	Q	Q	Q	Q	Q	.2	(*)	.03	.04	28.0
Florida	Q	Q	Q	Q	Q	Q	Q	Q	.3	.01	.06	.08	40.0
New York	2.6	.20	1.47	1.31	.3	Q	Q	.06	Q	Q	Q	Q	30.4
Texas	NC	NC	NC	NC	Q	Q	Q	Q	Q	.01	.13	.10	36.0
Urban Status													
Urban	8.1	.67	4.81	4.37	1.8	.02	.16	.17	1.9	.09	.94	.86	14.8
Central City	2.7	.16	1.16	.99	.5	.01	.05	.06	.2	.01	.10	.10	21.4
Suburban	5.4	.51	3.65	3.39	1.3	.01	.10	.12	1.6	.08	.84	.76	16.8
Rural	2.6	.23	1.70	1.50	1.8	.02	.18	.19	3.7	.21	2.30	1.95	14.3
Climate Zone [2]													
Under 2,000 CDD and Over 7,000 HDD	2.0	.19	1.37	1.19	.4	.01	.08	.08	.8	.06	.60	.49	29.1
5,500 to 7,000 HDD	3.4	.33	2.35	2.13	.9	.01	.08	.09	1.1	.09	1.01	.80	30.2
4,000 to 5,499 HDD	4.6	.35	2.55	2.33	1.0	.01	.06	.07	.8	Q	Q	.50	22.9
Under 4,000 HDD	.4	.03	.21	.19	.8	.01	.08	.09	1.3	.05	.55	.54	33.1
2,000 CDD or More and Under 4,000 HDD	Q	Q	Q	Q	.5	.01	.04	.05	1.6	.05	.49	.48	30.0
Total Number of Rooms (Excluding Bathrooms)													
1 or 2	.4	.01	.08	.07	Q	Q	Q	Q	Q	Q	Q	Q	34.9
3 to 5	4.2	.28	2.01	1.74	1.9	.03	.24	.26	2.8	.12	1.32	1.18	12.5
6 to 8	5.1	.49	3.52	3.24	1.4	.01	.09	.10	2.5	.15	1.68	1.43	14.9
9 or More	.9	.12	.90	.83	.2	(*)	(*)	.01	.3	.02	.25	.20	26.3
Type of Housing Unit													
Single-Family	8.0	.76	5.49	5.05	2.6	.03	.19	.21	4.2	.24	2.63	2.24	12.7
Detached	7.4	.72	5.16	4.75	2.5	.03	.19	.21	4.1	.24	2.59	2.21	12.9
Attached	.6	.05	.33	.30	.2	(*)	.01	.01	Q	Q	Q	Q	26.5
Mobile Home	.3	.02	.13	.12	.7	.02	.13	.14	1.3	.05	.60	.55	23.0
Multifamily	2.4	.12	.89	.71	.3	(*)	.01	.01	Q	Q	Q	Q	20.3
2 to 4 Units	.9	.07	.53	.48	.2	(*)	.01	.01	Q	Q	Q	Q	25.4
5 or More Units	1.5	.05	.36	.23	Q	Q	Q	Q	Q	Q	Q	Q	19.1
Heated Floorspace (square feet)													
Fewer than 1,000	2.3	.11	.78	.64	1.2	.02	.17	.19	1.7	.07	.72	.68	14.3
1,000 to 1,999	3.9	.31	2.21	2.02	1.4	.02	.12	.13	2.3	.11	1.18	1.04	14.3
2,000 to 2,999	2.9	.30	2.14	1.95	.6	(*)	.02	.02	1.0	.07	.73	.63	18.7
3,000 or More	1.6	.19	1.38	1.26	.3	Q	Q	Q	.6	.06	.62	.46	20.8

See footnotes at end of table.

Table 5.15. Total Fuel Oil, Kerosene, and LPG Consumption and Expenditures for Space Heating in U.S. Households, 1993 (Continued)

Characteristics	Fuel Oil				Kerosene				Liquefied Petroleum Gas				RSE Row Factors
		Total Consumed				Total Consumed				Total Consumed			
	Households (million)	(quadrillion Btu)	(billion gallons)	Total Expenditures (billion dollars)	Households (million)	(quadrillion Btu)	(billion gallons)	Total Expenditures (billion dollars)	Households (million)	(quadrillion Btu)	(billion gallons)	Total Expenditures (billion dollars)	
RSE Column Factors:	0.6	0.7 [1]	0.7 [1]	0.7 [1]	1.1	1.5 [1]	1.5 [1]	1.5 [1]	0.9	1.1 [1]	1.1 [1]	1.0 [1]	
Ownership of Unit													
Owned	7.7	0.74	5.31	4.89	2.5	0.03	0.23	0.25	4.7	0.25	2.76	2.38	12.3
Rented	3.0	.17	1.20	.99	1.0	.01	.11	.11	.9	.04	.49	.44	13.5
Public Housing	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	NF
Not Public Housing	2.8	.16	1.16	.97	1.0	.01	.10	.11	.9	.04	.48	.43	13.6
Rent Subsidy	.2	.01	.09	.07	Q	Q	Q	Q	Q	Q	Q	Q	30.4
No Rent Subsidy	2.6	.15	1.07	.90	1.0	.01	.10	.11	.9	.04	.46	.41	14.7
Year of Construction													
1939 or Before	4.2	.39	2.81	2.50	1.1	.01	.09	.10	1.4	.10	1.13	.90	14.5
1940 to 1949	1.2	.09	.67	.59	.3	(*)	.03	.03	.4	.03	.27	.24	26.6
1950 to 1959	1.9	.17	1.20	1.13	.4	(*)	.03	.03	.6	.02	.24	.22	27.1
1960 to 1969	1.3	.09	.66	.60	.7	(*)	.03	.04	.7	.04	.46	.41	22.0
1970 to 1979	1.3	.10	.75	.67	.6	.01	.09	.09	1.2	.05	.52	.46	17.7
1980 to 1984	.3	.02	.12	.11	.2	(*)	.02	.03	.3	.01	.12	.11	25.0
1985 to 1987	.2	.01	.10	.09	.2	(*)	.01	.01	.3	.01	.16	.15	31.4
1988 to 1990	.2	.02	.12	.11	.2	Q	Q	Q	.3	.01	.15	.14	33.1
1991 to 1993 [3]	.1	.01	.07	.07	Q	Q	Q	Q	.4	.02	.19	.17	37.3
Fuel Oil Paid by Household	**8.6**	**.81**	**5.85**	**5.38**	--	--	--	--	--	--	--	--	**14.4**
Liquified Petroleum Gas Paid by Household	--	--	--	--	--	--	--	--	**5.4**	**.29**	**3.15**	**2.73**	**16.8**
1993 Family Income													
Less than $5,000	.4	.03	.18	.16	.1	(*)	.02	.02	.2	.01	.14	.12	32.6
$5,000 to $9,999	.9	.07	.48	.43	.5	.01	.05	.06	.8	.03	.37	.34	22.3
$10,000 to $14,999	1.0	.08	.59	.52	.4	.01	.06	.06	.6	.03	.28	.26	20.9
$15,000 to $19,999	.9	.08	.57	.50	.6	.01	.08	.09	.6	.03	.34	.30	22.4
$20,000 to $24,999	.9	.07	.53	.46	.3	(*)	.03	.03	.7	.03	.36	.31	22.1
$25,000 to $34,999	1.7	.14	1.03	.94	.5	.01	.04	.05	1.2	.06	.66	.57	20.6
$35,000 to $49,999	2.4	.18	1.32	1.19	.5	(*)	.03	.03	.8	.05	.56	.47	16.6
$50,000 to $74,999	1.6	.15	1.05	.97	.4	(*)	.01	.02	.5	.03	.38	.31	17.0
$75,000 or More	.9	.10	.75	.72	.3	Q	Q	Q	.3	.01	.16	.13	28.0
Below Poverty Line													
100 Percent	1.2	.08	.58	.50	.7	.01	.09	.09	1.1	.05	.52	.48	19.3
125 Percent	1.8	.12	.86	.73	1.0	.02	.12	.13	1.6	.07	.74	.66	18.0
150 Percent	2.2	.16	1.12	.98	1.2	.02	.13	.14	1.8	.08	.84	.76	17.0
Eligible for Federal Assistance [4]	**2.9**	**.22**	**1.60**	**1.40**	**1.4**	**.02**	**.17**	**.19**	**2.0**	**.09**	**.96**	**.88**	**15.0**
Age of Householder													
Under 25 Years	.4	.02	.13	.12	.2	(*)	.02	.02	.2	.01	.09	.08	29.0
25 to 34 Years	1.6	.12	.86	.74	.6	.01	.06	.07	.9	.04	.49	.43	17.9
35 to 44 Years	2.4	.18	1.27	1.16	1.0	.01	.09	.10	1.1	.05	.57	.50	15.7
45 to 59 Years	2.7	.23	1.67	1.52	1.0	.01	.07	.08	1.5	.08	.92	.79	15.4
60 Years and Over	3.6	.36	2.58	2.34	.7	.01	.09	.09	1.9	.11	1.18	1.01	17.7
Education of Householder													
Less than 13 Years	5.9	.46	3.33	2.95	2.4	.03	.25	.28	4.0	.20	2.22	1.92	11.9
13 to 16 Years	3.5	.32	2.30	2.11	.8	.01	.07	.07	1.4	.08	.88	.76	13.7
17 Years or More	1.2	.12	.87	.82	.3	Q	Q	Q	.2	.01	.15	.13	26.8

See footnotes at end of table.

Table 5.15. Total Fuel Oil, Kerosene, and LPG Consumption and Expenditures for Space Heating in U.S. Households, 1993 (Continued)

Characteristics	Fuel Oil				Kerosene				Liquefied Petroleum Gas				RSE Row Factors
	Households (million)	Total Consumed (quadrillion Btu)	Total Consumed (billion gallons)	Total Expenditures (billion dollars)	Households (million)	Total Consumed (quadrillion Btu)	Total Consumed (billion gallons)	Total Expenditures (billion dollars)	Households (million)	Total Consumed (quadrillion Btu)	Total Consumed (billion gallons)	Total Expenditures (billion dollars)	
RSE Column Factors:	0.6	0.7 [1]	0.7 [1]	0.7 [1]	1.1	1.5 [1]	1.5 [1]	1.5 [1]	0.9	1.1 [1]	1.1 [1]	1.0 [1]	
Race of Householder													
White	9.4	0.82	5.95	5.39	3.0	0.04	0.26	0.28	5.2	0.29	3.13	2.70	11.7
Black	.8	.06	.42	.38	.5	.01	.06	.07	.4	.01	.09	.09	28.6
Other [5]	.4	.02	.14	.11	Q	Q	Q	Q	Q	Q	Q	Q	27.9
Householder of Hispanic Descent													
Yes	.9	.05	.39	.32	Q	Q	Q	Q	.3	.01	.08	.08	26.4
No	9.7	.85	6.12	5.56	3.4	.04	.32	.35	5.3	.29	3.17	2.74	11.3
Household Size													
1 Person	2.3	.18	1.30	1.18	.6	.01	.08	.08	.9	.05	.53	.46	17.8
2 Persons	3.5	.30	2.19	1.96	1.1	.01	.10	.11	2.2	.12	1.29	1.14	17.5
3 Persons	2.0	.18	1.27	1.15	.9	.01	.07	.08	1.0	.05	.55	.48	15.8
4 Persons	1.7	.14	1.04	.95	.6	.01	.04	.04	.8	.04	.45	.40	16.6
5 Persons	.8	.06	.45	.40	.4	.01	.04	.04	.5	.03	.33	.26	22.6
6 or More Persons	.4	.04	.26	.23	Q	Q	Q	Q	.2	.01	.10	.08	26.8

[1] This factor is underestimated because it contains no error for estimating this end use.
[2] Climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[3] Does not include all new construction for 1993.
[4] Below 150 percent of poverty line or 60 percent of median State income.
[5] Includes some householders who described themselves as Hispanic rather than White, Black, or other.
(*) = Value rounds to zero in the units displayed.
-- = Not applicable.
NC = No cases in sample.
NF = No applicable RSE row factor.
Q = Data withheld either because the Relative Standard Error (RSE) was greater than 50 percent or fewer than 10 households were sampled.
Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • See ''Glossary'' for definition of terms used in this report.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A, B, C, D, and G of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.16. Electricity Consumption and Expenditures for Main Space Heating, per U.S. Household, 1993

Characteristics	Households (million)	Consumption (million Btu)	Consumption (kWh)	Expenditures (dollars)	Heated Floorspace (square feet)	Annual Heating Degree-Days 1993	Annual Heating Degree-Days 30-Year Average [2]	Electricity Space-Heating Intensity Consumption (kWh/HDD* 1000 square feet)	Electricity Space-Heating Intensity Expenditures (cents/HDD* 1000 square feet)	RSE Row Factors
RSE Column Factors:	1.6	1.1 [1]	1.1 [1]	1.0 [1]	0.7	1.0	1.0	0.8 [1]	0.9 [1]	
Total U.S. Households	**25.0**	**15.5**	**4,541**	**327**	**1,405**	**3,429**	**3,452**	**0.94**	**6.8**	**3.2**
Census Region and Division										
Northeast	1.9	19.5	5,715	538	1,426	6,043	6,044	.66	6.2	4.6
New England	.5	18.6	5,464	577	1,187	6,329	6,346	.73	7.7	6.8
Middle Atlantic	1.4	19.8	5,797	525	1,504	5,950	5,945	.65	5.9	6.0
Midwest	2.9	24.2	7,097	499	1,573	6,254	6,066	.72	5.1	7.3
East North Central	1.6	25.9	7,590	551	1,628	6,416	6,332	.73	5.3	8.1
West North Central	1.3	22.1	6,481	435	1,505	6,052	5,733	.71	4.8	12.1
South	14.6	13.7	4,028	292	1,457	2,442	2,434	1.13	8.2	4.1
South Atlantic	8.7	11.9	3,487	270	1,482	2,206	2,248	1.07	8.3	5.8
East South Central	2.5	19.5	5,714	339	1,478	3,545	3,449	1.09	6.5	6.3
West South Central	3.4	14.2	4,166	313	1,379	2,236	2,163	1.35	10.1	7.6
West	5.6	14.2	4,160	259	1,177	3,650	3,873	.97	6.0	6.2
Mountain	1.4	13.7	4,026	267	1,337	3,437	3,524	.88	5.8	12.5
Pacific	4.2	14.3	4,203	256	1,126	3,718	3,985	1.00	6.1	7.3
Largest Populated States										
California	2.2	6.3	1,853	192	1,118	1,932	2,305	.86	8.9	7.5
Florida	4.4	6.2	1,817	151	1,467	660	780	1.88	15.6	16.9
New York	Q	14.9	4,360	516	923	6,574	6,537	.72	8.5	20.5
Texas	2.4	13.2	3,874	296	1,395	2,029	1,968	1.37	10.5	9.4
Urban Status										
Urban	19.5	13.7	4,007	302	1,394	3,095	3,156	.93	7.0	3.9
Central City	7.4	11.0	3,224	245	1,129	2,886	2,945	.99	7.5	6.5
Suburban	12.1	15.3	4,486	336	1,555	3,223	3,286	.89	6.7	5.2
Rural	5.5	21.9	6,421	416	1,447	4,605	4,495	.96	6.2	4.5
Climate Zone [2]										
Under 2,000 CDD and										
Over 7,000 HDD	.9	27.2	7,976	417	1,146	7,893	7,821	.88	4.6	6.7
5,500 to 7,000 HDD	4.0	23.2	6,799	491	1,440	6,217	6,132	.76	5.5	6.6
4,000 to 5,499 HDD	5.8	20.4	5,981	409	1,522	4,727	4,689	.83	5.7	4.6
Under 4,000 HDD	4.8	12.2	3,586	278	1,247	2,693	2,810	1.07	8.3	7.1
2,000 CDD or More and										
Under 4,000 HDD	9.5	9.7	2,856	224	1,424	1,398	1,467	1.43	11.2	6.7
Type of Housing Unit										
Single-Family	14.1	20.0	5,871	412	1,798	3,464	3,462	.94	6.6	3.6
Detached	11.9	20.8	6,092	424	1,873	3,429	3,423	.95	6.6	3.7
Attached	2.2	16.0	4,695	351	1,399	3,648	3,671	.92	6.9	9.6
Mobile Home	1.5	18.1	5,294	359	999	3,808	3,735	1.39	9.4	7.7
Multifamily	9.3	8.2	2,410	193	879	3,314	3,391	.83	6.6	5.5
2 to 4 Units	2.2	12.8	3,761	292	859	3,861	3,906	1.13	8.8	8.3
5 or More Units	7.2	6.8	1,996	162	885	3,146	3,232	.72	5.8	6.2
Heated Floorspace (square feet)										
Fewer than 1,000	9.4	10.7	3,125	232	726	3,501	3,550	1.23	9.1	4.1
1,000 to 1,999	10.8	16.3	4,770	340	1,404	3,280	3,294	1.04	7.4	3.7
2,000 to 2,999	3.4	21.7	6,372	456	2,411	3,495	3,495	.76	5.4	3.8
3,000 or More	1.3	27.7	8,125	570	3,720	3,970	3,954	.55	3.9	6.8
Total Number of Rooms (Excluding Bathrooms)										
1 or 2	1.1	6.4	1,875	159	499	3,487	3,603	1.08	9.2	16.4
3 to 5	14.9	12.4	3,645	268	1,071	3,403	3,439	1.00	7.3	3.7
6 to 8	8.2	21.4	6,266	443	1,980	3,483	3,471	.91	6.4	4.0
9 or More	.8	24.8	7,263	479	3,020	3,275	3,300	.73	4.8	10.7

See footnotes at end of table.

Table 5.16. Electricity Consumption and Expenditures for Main Space Heating, per U.S. Household, 1993 (Continued)

Characteristics	Households (million)	Consumption (million Btu)	Consumption (kWh)	Expenditures (dollars)	Heated Floorspace (square feet)	Annual Heating Degree-Days 1993	Annual Heating Degree-Days 30-Year Average [2]	Electricity Space-Heating Intensity Consumption (kWh/HDD* 1000 square feet)	Electricity Space-Heating Intensity Expenditures (cents/HDD* 1000 square feet)	RSE Row Factors
RSE Column Factors:	1.6	1.1 [1]	1.1 [1]	1.0 [1]	0.7	1.0	1.0	0.8 [1]	0.9 [1]	
Ownership of Unit										
Owned	13.7	19.6	5,748	404	1,814	3,399	3,401	0.93	6.6	3.4
Rented	11.2	10.5	3,066	233	906	3,465	3,515	.98	7.4	4.4
Public Housing	1.5	9.4	2,748	219	762	3,989	4,014	.90	7.2	12.7
Not Public Housing	9.7	10.6	3,115	235	928	3,385	3,438	.99	7.5	5.1
Rent Subsidy	.7	10.3	3,021	244	785	4,541	4,553	.85	6.9	15.3
No Rent Subsidy	9.1	10.6	3,121	234	939	3,302	3,358	1.01	7.6	5.3
Year of Construction										
1939 or Before	1.3	22.0	6,444	432	1,231	4,623	4,619	1.13	7.6	8.4
1940 to 1949	.7	23.7	6,948	384	1,291	4,454	4,521	1.21	6.7	11.2
1950 to 1959	1.9	17.3	5,075	380	1,403	3,060	3,116	1.18	8.9	8.9
1960 to 1969	3.4	15.8	4,639	347	1,336	3,285	3,322	1.06	7.9	7.3
1970 to 1979	7.0	16.0	4,702	333	1,375	3,691	3,712	.93	6.6	5.6
1980 to 1984	3.9	14.2	4,158	312	1,401	3,224	3,258	.92	6.9	5.6
1985 to 1987	2.7	12.2	3,588	265	1,489	3,012	3,030	.80	5.9	8.8
1988 to 1990	2.2	14.4	4,209	314	1,521	3,346	3,356	.83	6.2	6.4
1991 to 1993 [3]	1.9	12.4	3,620	260	1,565	3,012	2,992	.77	5.5	11.4
Main Space-Heating Fuel Paid by Household										
Yes	23.6	15.7	4,597	330	1,447	3,400	3,418	.93	6.7	3.3
No	1.4	12.3	3,613	284	720	3,905	4,019	1.28	10.1	12.8
1993 Family Income										
Less than $5,000	1.2	10.2	2,982	229	863	3,483	3,446	.99	7.6	9.3
$5,000 to $9,999	3.1	13.6	3,973	303	873	3,877	3,885	1.17	9.0	6.9
$10,000 to $14,999	2.8	12.2	3,582	262	1,011	3,341	3,415	1.06	7.8	7.4
$15,000 to $19,999	2.4	13.9	4,083	280	1,179	3,275	3,330	1.06	7.3	7.9
$20,000 to $24,999	2.3	16.5	4,845	329	1,260	3,520	3,508	1.09	7.4	7.5
$25,000 to $34,999	3.9	15.7	4,610	335	1,449	3,344	3,381	.95	6.9	5.5
$35,000 to $49,999	4.4	16.1	4,716	331	1,617	3,294	3,300	.89	6.2	4.8
$50,000 to $74,999	3.1	18.3	5,358	382	1,950	3,463	3,478	.79	5.7	4.6
$75,000 or More	1.8	21.1	6,186	462	2,189	3,294	3,336	.86	6.4	8.2
Below Poverty Line										
100 Percent	3.9	11.9	3,493	267	910	3,470	3,487	1.11	8.5	6.1
125 Percent	5.2	12.8	3,751	278	954	3,525	3,543	1.12	8.3	5.7
150 Percent	6.9	13.0	3,816	282	1,011	3,517	3,535	1.07	7.9	5.6
Eligible for Federal Assistance [4]	**8.3**	**13.2**	**3,854**	**285**	**1,015**	**3,543**	**3,580**	**1.07**	**7.9**	**4.8**
Age of Householder										
Under 25 Years	2.3	10.1	2,957	223	919	3,403	3,388	.95	7.1	7.9
25 to 34 Years	5.7	13.5	3,969	289	1,208	3,481	3,510	.94	6.9	4.9
35 to 44 Years	5.4	16.2	4,747	339	1,541	3,455	3,476	.89	6.4	4.7
45 to 59 Years	5.2	18.0	5,289	375	1,694	3,417	3,415	.91	6.5	4.5
60 Years and Over	6.4	16.5	4,838	348	1,407	3,380	3,434	1.02	7.3	5.3
Education of Householder										
Less than 13 Years	12.3	15.9	4,666	333	1,257	3,575	3,581	1.04	7.4	3.5
13 to 16 Years	9.8	15.0	4,391	320	1,510	3,325	3,366	.87	6.4	4.5
17 Years or More	2.9	15.4	4,516	328	1,685	3,155	3,194	.85	6.2	7.3
Race of Householder										
White	20.9	16.3	4,764	338	1,484	3,516	3,527	.91	6.5	3.2
Black	2.6	12.1	3,545	278	1,039	3,068	3,099	1.11	8.7	7.4
Other [5]	1.5	10.6	3,114	263	935	2,817	2,999	1.18	10.0	10.4

See footnotes at end of table.

Table 5.16. Electricity Consumption and Expenditures for Main Space Heating, per U.S. Household, 1993 (Continued)

Characteristics	Households (million)	Consumption (million Btu)	Consumption (kWh)	Expenditures (dollars)	Heated Floorspace (square feet)	Annual Heating Degree-Days 1993	Annual Heating Degree-Days 30-Year Average [2]	Electricity Space-Heating Intensity Consumption (kWh/HDD* 1000 square feet)	Electricity Space-Heating Intensity Expenditures (cents/HDD* 1000 square feet)	RSE Row Factors
RSE Column Factors:	1.6	1.1 [1]	1.1 [1]	1.0 [1]	0.7	1.0	1.0	0.8 [1]	0.9 [1]	
Householder of Hispanic Descent										
Yes	2.1	9.8	2,884	239	1,168	2,470	2,603	1.00	8.3	10.2
No	22.9	16.0	4,695	335	1,427	3,518	3,531	.93	6.7	3.2
Household Size										
1 Person	7.2	12.8	3,753	283	1,056	3,647	3,679	.97	7.3	4.8
2 Persons	8.6	16.5	4,838	343	1,481	3,389	3,420	.96	6.8	4.5
3 Persons	3.8	15.1	4,439	322	1,450	3,244	3,251	.94	6.8	5.8
4 Persons	3.1	17.4	5,111	357	1,702	3,371	3,371	.89	6.2	4.9
5 Persons	1.6	18.7	5,487	386	1,715	3,504	3,514	.91	6.4	6.9
6 or More Persons	.7	16.6	4,878	345	1,812	2,738	2,801	.98	6.9	11.6
Main Heating Equipment Using Electricity										
Central Warm-Air Furnace	9.2	13.4	3,923	280	1,341	2,772	2,798	1.06	7.5	5.6
Built-In Electric Units	6.9	17.8	5,223	373	1,177	4,813	4,825	.92	6.6	4.7
Heat Pump	7.5	16.6	4,863	352	1,774	3,016	3,033	.91	6.6	4.5
Other	1.3	11.8	3,447	270	951	3,126	3,228	1.16	9.1	9.3
Age of Main Heating Equipment										
Less than 5 Years	5.4	14.7	4,309	312	1,530	2,875	2,895	.98	7.1	5.5
5 to 9 Years	5.3	15.3	4,472	313	1,596	3,042	3,069	.92	6.4	6.1
10 to 19 Years	6.5	17.9	5,240	375	1,484	3,883	3,885	.91	6.5	4.6
20 Years or More	3.2	19.3	5,657	407	1,435	3,996	4,051	.99	7.1	7.8
Don't Know	4.7	10.7	3,141	238	917	3,479	3,509	.98	7.5	5.7
Secondary Heating Fuel (more than one may apply)										
No	15.9	12.8	3,741	279	1,157	3,292	3,339	.98	7.3	4.3
Yes	9.1	20.3	5,940	411	1,840	3,668	3,650	.88	6.1	3.7
Wood	6.0	22.3	6,524	445	2,056	3,823	3,799	.83	5.7	4.3
Electricity	2.8	18.7	5,495	374	1,646	3,278	3,265	1.02	6.9	6.5
Natural Gas	.6	16.3	4,770	367	1,753	2,861	2,837	.95	7.3	9.2
Kerosene	.6	22.7	6,657	456	1,673	4,667	4,560	.85	5.8	10.6
Other	.2	23.7	6,941	470	1,986	4,476	4,606	.78	5.3	18.7
Average Electricity Expenditures for Main Space Heat (cents per kWh)										
Less than 6	4.6	25.2	7,378	377	1,454	5,063	5,031	1.00	5.1	5.8
6 to Less than 9	14.3	15.1	4,426	330	1,487	3,123	3,099	.95	7.1	4.4
9 or More	6.1	9.1	2,664	281	1,178	2,909	3,084	.78	8.2	6.2

See footnotes at end of table.

Table 5.16. Electricity Consumption and Expenditures for Main Space Heating, per U.S. Household, 1993 (Continued)

Characteristics	Households (million)	Consumption (million Btu)	Consumption (kWh)	Expenditures (dollars)	Heated Floorspace (square feet)	Annual Heating Degree-Days 1993	Annual Heating Degree-Days 30-Year Average [2]	Electricity Space-Heating Intensity Consumption (kWh/HDD* 1000 square feet)	Electricity Space-Heating Intensity Expenditures (cents/HDD* 1000 square feet)	RSE Row Factors
RSE Column Factors:	1.6	1.1 [1]	1.1 [1]	1.0 [1]	0.7	1.0	1.0	0.8 [1]	0.9 [1]	
Adequacy of Insulation										
Well Insulated	10.2	16.6	4,872	349	1,610	3,534	3,543	0.86	6.1	3.9
Adequately Insulated	9.8	14.6	4,265	307	1,351	3,263	3,294	.97	7.0	3.8
Poorly Insulated	4.9	15.0	4,401	321	1,091	3,540	3,578	1.14	8.3	5.9

[1] This factor is underestimated because it contains no error for estimating this end use.
[2] The 30-year average and climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[3] Does not include all new construction for 1993.
[4] Below 150 percent of poverty line or 60 percent of median State income.
[5] Includes some householders who described themselves as Hispanic rather than White, Black, or other.
Q = Data withheld either because the Relative Standard Error (RSE) was greater than 50 percent or fewer than 10 households were sampled.
Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • See ''Glossary'' for definition of terms used in this report.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A, B, C, and E of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.17. Natural Gas Consumption and Expenditures for Main Space Heating, per U.S. Household, 1993

Characteristics	Households (million)	Consumption (million Btu)	Consumption (1000 cubic feet)	Expenditures (dollars)	Heated Floorspace (square feet)	Annual Heating Degree-Days 1993	Annual Heating Degree-Days 30-Year Average [2]	Natural Gas Space-Heating Intensity Consumption (cubic feet/ HDD*1000 square feet)	Natural Gas Space-Heating Intensity Expenditures (cents/ HDD*1000 square feet)	RSE Row Factors
RSE Column Factors:	1.7	1.0 [1]	1.0 [1]	1.0 [1]	0.8	0.8	0.8	1.0 [1]	1.1 [1]	
Total U.S. Households	**51.4**	**70.9**	**68.9**	**424**	**1,712**	**4,818**	**4,801**	**8.4**	**5.1**	**1.9**
Census Region and Division										
Northeast	9.4	81.6	79.4	613	1,735	5,790	5,833	7.9	6.1	3.0
New England	1.6	78.7	76.5	651	1,566	5,912	5,956	8.3	7.0	6.7
Middle Atlantic	7.9	82.2	80.0	606	1,769	5,766	5,808	7.8	5.9	3.4
Midwest	16.9	92.3	89.8	496	1,880	6,601	6,460	7.2	4.0	2.6
East North Central	12.9	93.1	90.5	504	1,879	6,519	6,438	7.4	4.1	2.8
West North Central	4.0	89.7	87.2	473	1,882	6,863	6,531	6.8	3.7	5.8
South	13.0	58.9	57.3	359	1,604	3,200	3,081	11.2	7.0	4.5
South Atlantic	4.7	60.4	58.7	426	1,627	3,554	3,488	10.2	7.4	6.9
East South Central	2.3	71.5	69.6	406	1,824	3,379	3,296	11.3	6.6	7.9
West South Central	6.1	53.0	51.5	289	1,504	2,858	2,685	12.0	6.7	7.4
West	12.1	45.4	44.2	243	1,576	3,310	3,529	8.5	4.7	4.1
Mountain	3.4	68.4	66.5	320	1,667	5,868	5,695	6.8	3.3	6.4
Pacific	8.7	36.4	35.4	214	1,540	2,313	2,685	9.9	6.0	4.0
Largest Populated States										
California	7.9	31.3	30.5	188	1,496	1,961	2,339	10.4	6.4	4.0
Florida	Q	29.6	28.8	230	1,627	1,227	1,263	14.4	Q	13.5
New York	3.6	80.7	78.5	647	1,718	5,900	5,893	7.7	6.4	5.3
Texas	3.6	50.0	48.6	274	1,539	2,724	2,549	11.6	6.5	11.8
Urban Status										
Urban	44.2	68.7	66.9	417	1,692	4,709	4,729	8.4	5.2	2.0
Central City	19.2	67.2	65.3	418	1,490	4,569	4,597	9.6	6.1	3.3
Suburban	25.0	70.0	68.1	416	1,848	4,816	4,830	7.6	4.7	2.5
Rural	7.2	83.8	81.5	463	1,833	5,489	5,244	8.1	4.6	6.0
Climate Zone [2]										
Under 2,000 CDD and Over 7,000 HDD	4.4	92.7	90.2	501	1,991	8,206	7,971	5.5	3.1	5.2
5,500 to 7,000 HDD	17.6	89.8	87.3	520	1,819	6,463	6,378	7.4	4.4	2.5
4,000 to 5,499 HDD	10.3	79.0	76.9	521	1,786	4,994	4,957	8.6	5.8	3.8
Under 4,000 HDD	10.2	43.0	41.9	266	1,550	2,360	2,553	11.4	7.3	6.5
2,000 CDD or More and Under 4,000 HDD	9.0	45.5	44.3	266	1,467	2,547	2,552	11.9	7.1	5.5
Type of Housing Unit										
Single-Family	37.8	78.5	76.3	463	1,990	4,721	4,690	8.1	4.9	2.1
Detached	33.6	80.3	78.1	469	2,026	4,728	4,690	8.2	4.9	2.2
Attached	4.2	63.5	61.7	410	1,704	4,658	4,691	7.8	5.2	5.2
Mobile Home	1.8	55.1	53.6	309	972	5,137	5,030	10.7	6.2	6.6
Multifamily	11.8	49.1	47.7	317	939	5,082	5,120	10.0	6.6	3.5
2 to 4 Units	4.7	78.0	75.9	507	1,114	5,250	5,304	13.0	8.7	5.1
5 or More Units	7.1	29.7	28.9	190	821	4,970	4,997	7.1	4.6	3.8
Heated Floorspace (square feet)										
Fewer than 1000	13.9	45.4	44.2	281	738	4,727	4,730	12.7	8.1	2.7
1,000 to 1,999	21.8	65.2	63.5	392	1,443	4,434	4,433	9.9	6.1	2.5
2,000 to 2,999	10.1	92.9	90.4	552	2,391	5,361	5,310	7.1	4.3	2.9
3,000 or More	5.6	116.3	113.2	672	3,966	5,565	5,496	5.1	3.0	3.7
Total Number of Rooms (Excluding Bathrooms)										
1 or 2	1.5	23.0	22.4	159	518	4,644	4,645	9.3	6.6	7.2
3 to 5	23.1	54.2	52.8	330	1,147	4,675	4,673	9.8	6.2	2.6
6 to 8	23.2	83.3	81.0	493	2,099	4,905	4,877	7.9	4.8	2.2
9 or More	3.6	117.6	114.4	686	3,342	5,252	5,198	6.5	3.9	4.9

See footnotes at end of table.

Table 5.17. Natural Gas Consumption and Expenditures for Main Space Heating, per U.S. Household, 1993 (Continued)

Characteristics	Households (million)	Consumption (million Btu)	Consumption (1000 cubic feet)	Expenditures (dollars)	Heated Floorspace (square feet)	Annual Heating Degree-Days 1993	Annual Heating Degree-Days 30-Year Average [2]	Natural Gas Space-Heating Intensity Consumption (cubic feet/ HDD*1000 square feet)	Natural Gas Space-Heating Intensity Expenditures (cents/ HDD*1000 square feet)	RSE Row Factors
RSE Column Factors:	1.7	1.0 [1]	1.0 [1]	1.0 [1]	0.8	0.8	0.8	1.0 [1]	1.1 [1]	
Ownership of Unit										
Owned	34.5	80.5	78.3	478	2,023	4,895	4,857	7.9	4.8	2.1
Rented	17.0	51.2	49.8	314	1,082	4,663	4,688	9.9	6.2	2.9
Public Housing	1.7	37.4	36.4	233	851	4,749	4,771	9.0	5.8	7.9
Not Public Housing	15.2	52.8	51.4	323	1,109	4,653	4,678	10.0	6.3	3.1
Rent Subsidy	1.0	54.5	53.0	347	1,087	4,961	4,968	9.8	6.4	8.8
No Rent Subsidy	14.2	52.7	51.3	321	1,110	4,631	4,658	10.0	6.2	3.2
Year of Construction										
1939 or Before	12.6	90.9	88.4	549	1,707	5,459	5,410	9.5	5.9	3.4
1940 to 1949	4.3	71.4	69.5	432	1,534	4,615	4,642	9.8	6.1	4.8
1950 to 1959	8.2	70.4	68.5	433	1,639	4,267	4,299	9.8	6.2	3.9
1960 to 1969	9.0	69.1	67.2	410	1,660	4,839	4,831	8.4	5.1	3.8
1970 to 1979	7.7	59.1	57.5	333	1,660	4,722	4,660	7.3	4.2	4.0
1980 to 1984	3.5	48.0	46.7	287	1,640	4,218	4,231	6.8	4.1	6.0
1985 to 1987	2.2	57.1	55.5	345	1,912	4,477	4,496	6.5	4.0	6.4
1988 to 1990	1.8	64.1	62.4	374	2,273	5,302	5,258	5.2	3.1	6.6
1991 to 1993 [3]	2.1	60.0	58.3	361	2,243	4,753	4,705	5.5	3.4	8.6
Main Space-Heating Fuel Paid by Household										
Yes	44.0	74.3	72.3	443	1,849	4,743	4,720	8.2	5.1	2.0
No	7.5	50.8	49.4	310	908	5,263	5,281	10.3	6.5	4.7
1993 Family Income										
Less than $5,000	2.0	57.2	55.6	353	1,051	4,525	4,536	11.7	7.4	5.9
$5,000 to $9,999	5.2	62.3	60.6	375	1,165	4,697	4,651	11.1	6.9	3.8
$10,000 to $14,999	6.1	66.3	64.5	396	1,299	4,874	4,867	10.2	6.3	4.3
$15,000 to $19,999	5.3	72.5	70.5	423	1,483	4,936	4,901	9.6	5.8	4.4
$20,000 to $24,999	4.5	67.8	66.0	406	1,477	5,135	5,093	8.7	5.4	4.4
$25,000 to $34,999	7.0	70.7	68.8	419	1,675	4,956	4,912	8.3	5.0	4.0
$35,000 to $49,999	9.2	70.8	68.9	425	1,935	4,742	4,726	7.5	4.6	2.9
$50,000 to $74,999	7.1	74.7	72.6	440	2,057	4,824	4,812	7.3	4.4	3.6
$75,000 or More	5.1	86.7	84.3	534	2,654	4,531	4,588	7.0	4.4	4.6
Below Poverty Line										
100 Percent	7.3	59.9	58.3	364	1,185	4,451	4,445	11.1	6.9	3.9
125 Percent	9.7	62.0	60.3	376	1,230	4,614	4,598	10.6	6.6	3.7
150 Percent	12.4	63.0	61.3	380	1,238	4,639	4,619	10.7	6.6	3.1
Eligible for Federal Assistance [4]	**15.7**	**66.5**	**64.7**	**401**	**1,283**	**4,793**	**4,783**	**10.5**	**6.5**	**2.9**
Age of Householder										
Under 25 Years	2.6	57.8	56.2	336	1,176	4,914	4,898	9.7	5.8	6.6
25 to 34 Years	10.9	62.2	60.6	371	1,521	4,922	4,893	8.1	5.0	3.1
35 to 44 Years	11.4	65.7	63.9	398	1,828	4,704	4,690	7.4	4.6	3.3
45 to 59 Years	11.5	73.8	71.8	438	1,937	4,747	4,744	7.8	4.8	3.0
60 Years and Over	15.0	81.0	78.8	486	1,683	4,869	4,847	9.6	5.9	2.6
Education of Householder										
Less than 13 Years	26.7	69.7	67.8	415	1,502	4,894	4,863	9.2	5.6	2.3
13 to 16 Years	17.7	71.5	69.6	426	1,878	4,752	4,742	7.8	4.8	2.7
17 Years or More	7.0	73.6	71.6	452	2,098	4,697	4,715	7.3	4.6	3.9
Race of Householder										
White	41.7	72.3	70.4	429	1,795	4,982	4,949	7.9	4.8	2.1
Black	6.7	74.4	72.3	462	1,370	4,330	4,341	12.2	7.8	4.4
Other [5]	3.0	42.9	41.8	270	1,337	3,658	3,788	8.5	5.5	6.2

See footnotes at end of table.

Table 5.17. Natural Gas Consumption and Expenditures for Main Space Heating, per U.S. Household, 1993 (Continued)

Characteristics	Households (million)	Consumption (million Btu)	Consumption (1000 cubic feet)	Expenditures (dollars)	Heated Floorspace (square feet)	Annual Heating Degree-Days 1993	Annual Heating Degree-Days 30-Year Average [2]	Natural Gas Space-Heating Intensity Consumption (cubic feet/ HDD*1000 square feet)	Natural Gas Space-Heating Intensity Expenditures (cents/ HDD*1000 square feet)	RSE Row Factors
RSE Column Factors:	1.7	1.0 [1]	1.0 [1]	1.0 [1]	0.8	0.8	0.8	1.0 [1]	1.1 [1]	
Householder of Hispanic Descent										
Yes	4.1	47.4	46.1	293	1,339	3,859	3,966	8.9	5.7	5.3
No	47.4	72.9	70.9	435	1,744	4,901	4,873	8.3	5.1	2.0
Household Size										
1 Person	12.2	63.7	62.0	381	1,229	5,057	5,010	10.0	6.1	3.1
2 Persons	16.4	71.5	69.6	424	1,767	4,809	4,794	8.2	5.0	2.6
3 Persons	9.1	72.0	70.0	443	1,803	4,685	4,690	8.3	5.2	3.2
4 Persons	8.3	77.1	75.0	458	2,019	4,845	4,822	7.7	4.7	3.4
5 Persons	3.5	70.7	68.8	417	2,093	4,496	4,497	7.3	4.4	4.7
6 or More Persons	1.8	78.7	76.6	469	1,859	4,476	4,510	9.2	5.6	7.8
Main Heating Equipment Using Natural Gas										
Central Warm-Air Furnace	35.4	72.8	70.8	425	1,882	4,915	4,880	7.7	4.6	2.1
Steam or Hot-Water System	8.7	87.4	85.1	556	1,540	5,938	5,926	9.3	6.1	4.0
Floor, Wall, or Pipeless Furnace	4.3	36.8	35.8	227	1,093	2,750	2,888	11.9	7.5	5.5
Room Heater/Other	3.0	49.0	47.6	300	1,093	3,397	3,355	12.8	8.1	6.5
Age of Main Heating Equipment										
Less than 5 Years	9.7	70.4	68.5	425	1,987	4,954	4,907	7.0	4.3	3.2
5 to 9 Years	8.7	74.9	72.9	449	1,931	4,869	4,834	7.8	4.8	3.6
10 to 19 Years	11.1	75.1	73.1	443	1,807	4,854	4,822	8.3	5.1	2.9
20 Years or More	13.6	76.6	74.5	455	1,686	4,679	4,699	9.4	5.8	3.1
Don't Know	8.4	52.3	50.8	319	1,083	4,788	4,781	9.8	6.2	3.8
Secondary Heating Fuel (more than one may apply)										
No	18.0	75.8	73.7	441	2,111	4,596	4,584	7.6	4.5	2.5
Yes	33.4	68.2	66.3	414	1,497	4,939	4,918	9.0	5.6	2.4
Wood	9.7	78.2	76.1	452	2,381	4,627	4,635	6.9	4.1	3.4
Electricity	7.6	73.9	71.9	437	1,874	4,576	4,565	8.4	5.1	3.8
Kerosene	.9	92.4	89.9	527	2,001	5,449	5,356	8.2	4.8	9.4
Other	3.2	71.0	69.0	400	2,011	4,204	4,160	8.2	4.7	6.7
Average Natural Gas Expenditures for Main Space Heat (dollars per 1000 cf)										
Less than 4.50	2.4	100.1	97.3	396	2,014	6,773	6,486	7.1	2.9	11.1
4.50 to Less than 6	21.1	78.5	76.4	404	1,751	5,100	5,043	8.6	4.5	3.3
6 or More	27.9	62.5	60.8	441	1,657	4,434	4,471	8.3	6.0	3.3

See footnotes at end of table.

Table 5.17. Natural Gas Consumption and Expenditures for Main Space Heating, per U.S. Household, 1993 (Continued)

Characteristics	Households (million)	Consumption (million Btu)	Consumption (1000 cubic feet)	Expenditures (dollars)	Heated Floorspace (square feet)	Annual Heating Degree-Days 1993	Annual Heating Degree-Days 30-Year Average [2]	Natural Gas Space-Heating Intensity Consumption (cubic feet/ HDD*1000 square feet)	Natural Gas Space-Heating Intensity Expenditures (cents/ HDD*1000 square feet)	RSE Row Factors
RSE Column Factors:	1.7	1.0 [1]	1.0 [1]	1.0 [1]	0.8	0.8	0.8	1.0 [1]	1.1 [1]	
Adequacy of Insulation										
Well Insulated	18.2	72.3	70.3	431	1,933	4,945	4,905	7.4	4.5	2.7
Adequately Insulated	21.3	69.1	67.2	416	1,678	4,827	4,814	8.3	5.1	2.4
Poorly Insulated	11.9	71.8	69.9	426	1,436	4,611	4,620	10.5	6.4	3.3

[1] This factor is underestimated because it contains no error for estimating this end use.
[2] The 30-year average and climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[3] Does not include all new construction for 1993.
[4] Below 150 percent of poverty line or 60 percent of median State income.
[5] Includes some householders who described themselves as Hispanic rather than White, Black, or other.
Q = Data withheld either because the Relative Standard Error (RSE) was greater than 50 percent or fewer than 10 households were sampled.
Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • See ''Glossary'' for definition of terms used in this report.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A, B, C, and F of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.18. Fuel Oil Consumption and Expenditures for Main Space Heating, per U.S. Household, 1993

Characteristics	Households (million)	Consumption (million Btu)	Consumption (gallons)	Expenditures (dollars)	Heated Floorspace (square feet)	Annual Heating Degree-Days 1993	Annual Heating Degree-Days 30-Year Average [2]	Fuel Oil Space-Heating Intensity Consumption (gallons/ HDD*1000 square feet)	Fuel Oil Space-Heating Intensity Expenditures (cents/ HDD*1000 square feet)	RSE Row Factors
RSE Column Factors:	2.0	1.2 [1]	1.2 [1]	1.2 [1]	0.9	0.5	0.5	1.0 [1]	1.1 [1]	
Total U.S. Households	**10.2**	**86.6**	**625**	**564**	**1,911**	**5,877**	**5,858**	**0.056**	**5.0**	**3.5**
Census Region and Division										
Northeast	7.0	89.3	644	578	1,860	5,984	5,997	.058	5.2	4.4
New England	2.6	97.1	701	634	1,966	6,630	6,654	.054	4.9	7.4
Middle Atlantic	4.5	84.8	611	546	1,799	5,615	5,622	.061	5.4	5.0
Midwest	1.3	94.6	685	588	2,234	7,743	7,521	.040	3.4	4.4
East North Central	.7	100.2	725	628	2,240	7,348	7,203	.044	3.8	8.7
West North Central	.6	88.6	643	545	2,228	8,162	7,858	.035	3.0	5.4
South	1.5	70.2	507	485	1,835	3,830	3,818	.072	6.9	6.7
South Atlantic	1.4	70.5	509	488	1,884	3,801	3,788	.071	6.8	7.0
East South Central	Q	Q	Q	Q	Q	Q	Q	Q	Q	NF
West South Central	NC	NC	NC	NC	NC	NC	NC	NC	NC	NF
West	.4	74.4	537	543	2,028	5,395	5,437	.049	5.0	16.5
Mountain	Q	Q	Q	Q	Q	Q	Q	Q	Q	NF
Pacific	Q	72.9	526	538	2,057	5,176	5,307	.049	5.1	19.6
Largest Populated States										
California	Q	Q	Q	Q	Q	Q	Q	Q	Q	NF
Florida	Q	Q	Q	Q	Q	Q	Q	Q	Q	NF
New York	2.5	80.3	579	517	1,559	5,561	5,549	.067	6.0	7.7
Texas	NC	NC	NC	NC	NC	NC	NC	NC	NC	NF
Urban Status										
Urban	7.7	84.3	608	553	1,850	5,526	5,553	.059	5.4	4.4
Central City	2.6	61.1	441	374	1,388	5,148	5,208	.062	5.2	5.7
Suburban	5.1	96.0	692	643	2,083	5,717	5,727	.058	5.4	5.0
Rural	2.4	94.0	680	602	2,105	6,991	6,827	.046	4.1	3.7
Climate Zone [2]										
Under 2,000 CDD and Over 7,000 HDD	1.9	98.2	709	618	2,127	8,089	7,935	.041	3.6	3.9
5,500 to 7,000 HDD	3.3	98.2	709	641	2,121	6,343	6,327	.053	4.8	6.2
4,000 to 5,499 HDD	4.5	77.6	559	512	1,698	5,030	5,064	.065	6.0	4.9
Under 4,000 HDD	.4	69.6	502	454	1,565	3,633	3,578	.088	8.0	11.8
2,000 CDD or More and Under 4,000 HDD	Q	Q	Q	Q	Q	Q	Q	Q	Q	NF
Type of Housing Unit										
Single-Family	7.6	98.0	707	650	2,206	6,021	5,984	.053	4.9	3.6
Detached	7.0	99.8	720	662	2,233	6,056	6,010	.053	4.9	3.7
Attached	.6	76.9	555	507	1,887	5,597	5,673	.052	4.8	11.1
Mobile Home	.3	57.9	421	396	765	6,049	6,005	.091	8.6	14.1
Multifamily	2.3	53.0	382	305	1,084	5,385	5,426	.065	5.2	5.5
2 to 4 Units	.9	85.1	614	558	1,436	5,952	5,951	.072	6.5	6.3
5 or More Units	1.5	34.0	245	156	875	5,049	5,115	.055	3.5	4.1
Heated Floorspace (square feet)										
Fewer than 1000	2.2	47.5	343	282	722	5,379	5,399	.088	7.3	5.1
1,000 to 1,999	3.7	80.7	582	532	1,462	5,782	5,763	.069	6.3	3.9
2,000 to 2,999	2.8	105.8	763	697	2,431	6,204	6,169	.051	4.6	4.7
3,000 or More	1.5	123.3	889	814	3,804	6,239	6,192	.037	3.4	5.5
Total Number of Rooms (Excluding Bathrooms)										
1 or 2	.4	30.4	219	181	577	5,018	5,090	.076	6.2	10.5
3 to 5	4.1	67.4	487	422	1,314	5,827	5,821	.064	5.5	4.5
6 to 8	4.9	97.6	705	648	2,260	5,952	5,922	.052	4.8	3.5
9 or More	.9	137.6	993	917	3,282	6,038	5,986	.050	4.6	7.5

See footnotes at end of table.

Table 5.18. Fuel Oil Consumption and Expenditures for Main Space Heating, per U.S. Household, 1993 (Continued)

Characteristics	Households (million)	Consumption (million Btu)	Consumption (gallons)	Expenditures (dollars)	Heated Floorspace (square feet)	Annual Heating Degree-Days 1993	Annual Heating Degree-Days 30-Year Average [2]	Fuel Oil Space-Heating Intensity Consumption (gallons/ HDD*1000 square feet)	Fuel Oil Space-Heating Intensity Expenditures (cents/ HDD*1000 square feet)	RSE Row Factors
RSE Column Factors:	2.0	1.2 [1]	1.2 [1]	1.2 [1]	0.9	0.5	0.5	1.0 [1]	1.1 [1]	
Ownership of Unit										
Owned	7.3	98.4	710	653	2,179	6,044	6,009	0.054	5.0	3.6
Rented	2.9	56.9	411	340	1,235	5,456	5,477	.061	5.0	4.8
Public Housing	Q	Q	Q	Q	Q	Q	Q	Q	Q	NF
Not Public Housing	2.8	57.5	415	346	1,230	5,484	5,502	.062	5.1	4.9
Rent Subsidy	.2	54.5	393	311	909	5,023	5,088	.086	6.8	8.0
No Rent Subsidy	2.6	57.8	417	349	1,258	5,525	5,539	.060	5.0	5.3
Year of Construction										
1939 or Before	4.1	94.5	682	607	1,850	6,181	6,126	.060	5.3	4.1
1940 to 1949	1.2	77.8	561	495	1,647	5,539	5,529	.062	5.4	7.8
1950 to 1959	1.8	91.2	659	623	2,020	5,588	5,619	.058	5.5	8.1
1960 to 1969	1.2	73.7	532	484	1,879	5,203	5,246	.054	5.0	10.5
1970 to 1979	1.2	82.7	596	532	2,044	5,995	5,972	.049	4.3	7.6
1980 to 1984	.3	62.4	450	411	1,883	5,975	5,959	.040	3.7	7.7
1985 to 1987	.2	82.1	592	535	2,661	6,016	5,984	.037	3.3	17.8
1988 to 1990	.2	78.3	565	510	1,961	6,923	6,818	.042	3.8	11.5
1991 to 1993 [3]	.1	78.3	565	518	2,772	6,434	6,391	.032	2.9	11.2
Fuel Oil Paid by Household										
Yes	8.2	96.5	696	640	2,132	6,024	5,989	.054	5.0	3.5
No	2.0	45.8	330	249	991	5,267	5,313	.063	4.8	5.9
1993 Family Income										
Less than $5,000	.4	63.4	458	395	1,384	5,649	5,630	.059	5.1	14.0
$5,000 to $9,999	.9	74.0	534	472	1,364	5,723	5,712	.068	6.0	6.7
$10,000 to $14,999	.9	87.9	636	559	1,587	6,026	5,969	.066	5.8	8.3
$15,000 to $19,999	.9	89.7	648	572	1,531	5,933	5,909	.071	6.3	7.6
$20,000 to $24,999	.9	81.9	591	515	1,744	6,052	6,026	.056	4.9	7.4
$25,000 to $34,999	1.6	86.1	621	564	2,027	5,888	5,875	.052	4.7	8.2
$35,000 to $49,999	2.2	79.6	574	518	2,003	5,995	5,965	.048	4.3	4.9
$50,000 to $74,999	1.5	96.3	695	641	2,214	5,872	5,843	.053	4.9	4.4
$75,000 or More	.9	112.9	814	771	2,625	5,443	5,499	.057	5.4	8.3
Below Poverty Line										
100 Percent	1.2	65.6	473	406	1,393	5,605	5,586	.061	5.2	7.0
125 Percent	1.7	67.7	489	419	1,397	5,714	5,704	.061	5.2	6.3
150 Percent	2.2	70.6	510	443	1,428	5,721	5,698	.062	5.4	5.5
Eligible for Federal Assistance [4]	**2.8**	**77.7**	**561**	**491**	**1,480**	**5,846**	**5,814**	**.065**	**5.7**	**4.9**
Age of Householder										
Under 25 Years	.4	49.0	354	313	1,289	5,234	5,224	.052	4.6	17.3
25 to 34 Years	1.5	76.0	549	475	1,607	6,135	6,079	.056	4.8	5.3
35 to 44 Years	2.3	75.4	544	497	1,949	5,960	5,953	.047	4.3	4.7
45 to 59 Years	2.5	89.4	645	587	1,951	5,792	5,777	.057	5.2	4.3
60 Years and Over	3.5	100.5	726	658	2,055	5,839	5,825	.060	5.5	5.1
Education of Householder										
Less than 13 Years	5.7	79.8	576	510	1,716	5,882	5,860	.057	5.1	3.9
13 to 16 Years	3.4	91.8	663	607	2,089	5,926	5,909	.054	4.9	4.8
17 Years or More	1.1	105.4	760	710	2,355	5,698	5,692	.057	5.3	8.3
Race of Householder										
White	9.0	89.7	648	586	1,993	6,019	5,989	.054	4.9	3.6
Black	.8	70.4	507	459	1,380	4,803	4,879	.077	6.9	6.4
Other [5]	.4	49.0	354	287	1,132	4,859	4,902	.064	5.2	10.5

See footnotes at end of table.

Table 5.18. Fuel Oil Consumption and Expenditures for Main Space Heating, per U.S. Household, 1993 (Continued)

Characteristics	Households (million)	Consumption (million Btu)	Consumption (gallons)	Expenditures (dollars)	Heated Floorspace (square feet)	Annual Heating Degree-Days 1993	Annual Heating Degree-Days 30-Year Average [2]	Fuel Oil Space-Heating Intensity: Consumption (gallons/ HDD*1000 square feet)	Fuel Oil Space-Heating Intensity: Expenditures (cents/ HDD*1000 square feet)	RSE Row Factors
RSE Column Factors:	2.0	1.2 [1]	1.2 [1]	1.2 [1]	0.9	0.5	0.5	1.0 [1]	1.1 [1]	
Householder of Hispanic Descent										
Yes	0.9	59.3	428	349	1,323	5,182	5,235	0.062	5.1	7.0
No	9.3	89.3	644	585	1,968	5,944	5,918	.055	5.0	3.5
Household Size										
1 Person	2.3	79.3	573	522	1,449	5,835	5,834	.068	6.2	5.8
2 Persons	3.3	89.9	649	580	2,003	5,848	5,826	.055	5.0	5.1
3 Persons	1.9	91.2	658	599	2,078	5,988	5,972	.053	4.8	4.7
4 Persons	1.6	86.6	625	570	2,020	5,757	5,715	.054	4.9	5.2
5 Persons	.7	84.0	606	538	2,015	6,111	6,107	.049	4.4	9.2
6 or More Persons	.4	84.1	607	537	2,307	5,891	5,846	.045	4.0	9.3
Main Heating Equipment Using Fuel Oil										
Central Warm-Air Furnace	4.5	83.2	600	550	2,025	6,051	5,999	.049	4.5	4.4
Steam or Hot-Water System	5.3	91.0	657	585	1,865	5,760	5,770	.061	5.4	4.1
Other	.4	64.9	471	437	1,185	5,446	5,417	.073	6.8	12.6
Age of Main Heating Equipment										
Less than 5 Years	1.8	97.6	704	648	2,186	6,135	6,100	.053	4.8	6.0
5 to 9 Years	1.3	91.0	657	595	1,952	6,044	5,994	.056	5.0	5.2
10 to 19 Years	2.1	88.9	641	587	2,187	6,128	6,100	.048	4.4	4.9
20 Years or More	3.4	94.4	681	621	1,926	5,739	5,724	.062	5.6	4.2
Don't Know	1.6	51.7	373	300	1,182	5,427	5,454	.058	4.7	6.9
Secondary Heating Fuel (more than one may apply)										
No	3.8	94.5	682	630	2,298	5,866	5,824	.051	4.7	4.5
Yes	6.3	81.8	591	525	1,677	5,883	5,878	.060	5.3	3.7
Wood	2.3	100.8	727	686	2,606	5,853	5,841	.048	4.5	5.7
Electricity	1.5	86.9	627	579	2,156	5,709	5,669	.051	4.7	5.5
Kerosene	.5	80.0	578	519	1,895	5,579	5,472	.055	4.9	10.0
Other	.2	95.3	687	636	2,165	5,788	5,653	.055	5.1	13.5
Average Fuel Oil Expenditures for Main Space Heat (dollars per gallon)										
Less than .95	7.9	82.2	593	506	1,830	5,998	5,964	.054	4.6	4.3
1.10 or More	.4	98.3	709	835	2,039	4,837	4,884	.072	8.5	7.7

See footnotes at end of table.

Table 5.18. Fuel Oil Consumption and Expenditures for Main Space Heating, per U.S. Household, 1993 (Continued)

Characteristics	Households (million)	Consumption (million Btu)	Consumption (gallons)	Expenditures (dollars)	Heated Floorspace (square feet)	Annual Heating Degree-Days 1993	Annual Heating Degree-Days 30-Year Average [2]	Fuel Oil Space-Heating Intensity Consumption (gallons/ HDD*1000 square feet)	Fuel Oil Space-Heating Intensity Expenditures (cents/ HDD*1000 square feet)	RSE Row Factors
RSE Column Factors:	2.0	1.2 [1]	1.2 [1]	1.2 [1]	0.9	0.5	0.5	1.0 [1]	1.1 [1]	
Adequacy of Insulation										
Well Insulated	4.0	88.6	639	577	2,143	6,055	6,028	0.049	4.4	4.3
Adequately Insulated	4.1	86.5	624	567	1,821	5,819	5,810	.059	5.3	4.4
Poorly Insulated	2.2	83.2	600	537	1,655	5,659	5,637	.064	5.7	5.1

[1] This factor is underestimated because it contains no error for estimating this end use.
[2] The 30-year average and climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[3] Does not include all new construction for 1993.
[4] Below 150 percent of poverty line or 60 percent of median State income.
[5] Includes some householders who described themselves as Hispanic rather than White, Black, or other.
NC = No cases in sample.
NF = No applicable RSE row factor.
Q = Data withheld either because the Relative Standard Error (RSE) was greater than 50 percent or fewer than 10 households were sampled.
Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • See ''Glossary'' for definition of terms used in this report.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A, B, C, and G of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.19. Liquefied Petroleum Gas Consumption and Expenditures for Main Space Heating, per U.S. Household, 1993

Characteristics	Households (million)	Consumption (million Btu)	Consumption (gallons)	Expenditures (dollars)	Heated Floorspace (square feet)	Annual Heating Degree-Days 1993	Annual Heating Degree-Days 30-Year Average [2]	Liquefied Petroleum Gas Space-Heating Intensity: Consumption (gallons/ HDD*1000 square feet)	Liquefied Petroleum Gas Space-Heating Intensity: Expenditures (cents/ HDD*1000 square feet)	RSE Row Factors
RSE Column Factors:	1.9	1.0 [1]	1.0 [1]	0.9 [1]	0.8	0.8	0.8	1.0 [1]	1.1 [1]	
Total U.S. Households	**4.6**	**60.0**	**657**	**560**	**1,641**	**4,848**	**4,664**	**0.083**	**7.0**	**5.3**
Census Region and Division										
Northeast	.2	52.9	579	608	1,389	6,951	6,960	.060	6.3	13.4
New England	.1	52.9	580	592	1,174	6,865	6,928	.072	7.3	18.9
Middle Atlantic	.1	52.8	579	629	1,673	7,065	7,003	Q	Q	16.0
Midwest	1.8	86.5	947	726	2,098	6,929	6,642	.065	5.0	5.8
East North Central	.9	95.9	1,051	817	2,155	6,761	6,512	.072	5.6	7.9
West North Central	.9	76.4	836	628	2,037	7,109	6,781	.058	4.3	8.5
South	2.3	39.0	427	408	1,326	2,870	2,751	.112	10.7	7.4
South Atlantic	1.1	40.9	448	461	1,379	2,739	2,722	.119	12.2	11.0
East South Central	.7	40.7	446	410	1,275	3,411	3,142	.102	9.4	10.6
West South Central	.5	32.1	351	286	1,276	2,393	2,257	.115	9.4	20.9
West	.4	65.9	721	669	1,532	5,817	5,613	.081	7.5	14.2
Mountain	.3	72.9	799	673	1,463	6,046	5,742	.090	7.6	18.3
Pacific	.1	44.6	489	657	1,739	5,129	5,223	.055	7.4	27.7
Largest Populated States										
California	.1	23.8	261	331	1,493	4,400	4,469	.040	5.0	15.2
Florida	.3	17.1	188	248	1,067	937	1,027	.188	Q	25.8
New York	Q	58.8	643	638	2,165	7,720	7,545	Q	Q	16.1
Texas	.4	27.7	304	249	1,277	2,194	2,064	.108	8.9	28.3
Urban Status										
Urban	1.6	51.6	565	512	1,711	4,420	4,282	.075	6.8	9.8
Central City	.2	43.1	472	470	1,150	3,741	3,702	.110	10.9	23.3
Suburban	1.4	53.0	580	519	1,800	4,528	4,374	.071	6.4	10.1
Rural	3.0	64.3	704	585	1,605	5,070	4,862	.087	7.2	5.9
Climate Zone [2]										
Under 2,000 CDD and Over 7,000 HDD	.7	77.5	849	691	2,199	8,196	7,812	.047	3.8	8.2
5,500 to 7,000 HDD	1.1	85.9	941	743	1,906	6,883	6,688	.072	5.7	11.8
4,000 to 5,499 HDD	.7	78.1	855	709	1,894	5,322	5,025	.085	7.0	14.0
Under 4,000 HDD	.9	46.1	505	485	1,274	3,378	3,195	.117	11.3	10.0
2,000 CDD or More and Under 4,000 HDD	1.3	31.0	339	325	1,278	2,319	2,301	.115	11.0	12.2
Type of Housing Unit										
Single-Family	3.3	66.4	727	609	1,929	4,907	4,721	.077	6.4	6.2
Detached	3.3	66.6	729	610	1,935	4,869	4,680	.077	6.5	6.3
Attached	Q	Q	Q	Q	Q	Q	Q	Q	Q	NF
Mobile Home	1.2	43.8	479	436	886	4,659	4,459	.116	10.6	6.9
Multifamily	Q	Q	Q	Q	Q	Q	Q	Q	Q	NF
2 to 4 Units	Q	Q	Q	Q	Q	Q	Q	Q	Q	NF
5 or More Units	Q	Q	Q	Q	Q	Q	Q	Q	Q	NF
Heated Floorspace (square feet)										
Fewer than 1000	1.5	42.4	464	431	766	4,338	4,186	.140	13.0	7.0
1,000 to 1,999	1.8	54.5	597	518	1,392	4,426	4,250	.097	8.4	7.2
2,000 to 2,999	.8	76.4	837	712	2,484	5,595	5,360	.060	5.1	8.8
3,000 or More	.5	103.5	1,133	838	3,693	6,627	6,397	.046	3.4	8.4
Total Number of Rooms (Excluding Bathrooms)										
1 or 2	Q	Q	Q	Q	Q	Q	Q	Q	Q	NF
3 to 5	2.4	47.0	515	454	1,107	4,612	4,420	.101	8.9	7.2
6 to 8	1.9	73.3	803	670	2,137	5,034	4,858	.075	6.2	7.4
9 or More	.2	90.5	991	791	3,210	5,808	5,621	.053	4.2	13.0

See footnotes at end of table.

Table 5.19. Liquefied Petroleum Gas Consumption and Expenditures for Main Space Heating, per U.S. Household, 1993 (Continued)

Characteristics	Households (million)	Consumption (million Btu)	Consumption (gallons)	Expenditures (dollars)	Heated Floorspace (square feet)	Annual Heating Degree-Days 1993	Annual Heating Degree-Days 30-Year Average [2]	Liquefied Petroleum Gas Space-Heating Intensity: Consumption (gallons/ HDD*1000 square feet)	Liquefied Petroleum Gas Space-Heating Intensity: Expenditures (cents/ HDD*1000 square feet)	RSE Row Factors
RSE Column Factors:	1.9	1.0 [1]	1.0 [1]	0.9 [1]	0.8	0.8	0.8	1.0 [1]	1.1 [1]	
Ownership of Unit										
Owned	3.9	61.1	669	565	1,728	4,846	4,659	0.080	6.7	5.8
Rented	.8	54.5	597	534	1,196	4,860	4,689	.103	9.2	9.0
Public Housing	Q	Q	Q	Q	Q	Q	Q	Q	Q	NF
Not Public Housing	.7	54.5	596	533	1,206	4,794	4,614	.103	9.2	9.1
Rent Subsidy	Q	Q	Q	Q	Q	Q	Q	Q	Q	NF
No Rent Subsidy	.7	53.4	585	526	1,186	4,721	4,547	.105	9.4	9.5
Year of Construction										
1939 or Before	1.1	86.1	942	748	1,992	5,922	5,668	.080	6.3	6.3
1940 to 1949	.4	66.2	725	636	1,243	4,025	3,851	.145	12.7	17.1
1950 to 1959	.5	39.8	436	393	1,373	3,889	3,750	.082	7.4	17.0
1960 to 1969	.6	62.8	687	594	1,760	4,485	4,377	.087	7.5	12.2
1970 to 1979	.9	47.1	515	452	1,456	4,530	4,308	.078	6.8	8.9
1980 to 1984	.2	42.7	468	397	1,174	5,413	5,207	.074	6.2	12.6
1985 to 1987	.2	53.7	588	536	1,618	5,142	5,048	.071	6.4	14.3
1988 to 1990	.2	49.3	540	512	1,700	4,711	4,547	.067	6.4	14.9
1991 to 1993 [3]	.3	51.1	559	504	1,893	4,596	4,467	.064	5.8	13.6
Liquefied Petroleum Gas Paid by Household										
Yes	4.5	59.9	656	559	1,648	4,829	4,641	.082	7.0	5.4
No	Q	Q	Q	Q	Q	Q	Q	Q	Q	NF
1993 Family Income										
Less than $5,000	.2	56.7	621	568	1,094	3,827	3,730	.148	13.6	20.5
$5,000 to $9,999	.6	49.8	545	489	1,003	3,928	3,773	.138	12.4	13.3
$10,000 to $14,999	.6	43.2	473	424	1,266	4,597	4,314	.081	7.3	10.0
$15,000 to $19,999	.5	58.6	642	568	1,459	5,540	5,270	.079	7.0	12.3
$20,000 to $24,999	.6	54.1	592	511	1,330	4,832	4,646	.092	8.0	10.4
$25,000 to $34,999	.9	60.6	664	556	1,743	4,774	4,608	.080	6.7	8.7
$35,000 to $49,999	.6	73.0	799	648	2,382	5,512	5,410	.061	4.9	9.0
$50,000 to $74,999	.4	81.7	895	730	2,368	5,163	4,971	.073	6.0	12.2
$75,000 or More	.1	80.8	885	710	2,591	5,681	5,467	.060	4.8	13.8
Below Poverty Line										
100 Percent	.9	50.0	547	494	1,075	4,122	3,925	.123	11.2	10.5
125 Percent	1.3	48.1	526	468	1,104	4,285	4,055	.111	9.9	10.1
150 Percent	1.5	47.2	517	463	1,123	4,291	4,079	.107	9.6	9.3
Eligible for Federal Assistance [4]	**1.7**	**49.0**	**536**	**484**	**1,202**	**4,386**	**4,185**	**.102**	**9.2**	**8.7**
Age of Householder										
Under 25 Years	.2	40.6	444	399	901	4,794	4,600	.103	9.2	17.2
25 to 34 Years	.8	53.6	587	516	1,445	5,309	5,040	.077	6.7	8.0
35 to 44 Years	.8	56.6	620	532	1,661	4,721	4,551	.079	6.8	8.7
45 to 59 Years	1.2	63.4	694	582	1,776	4,938	4,777	.079	6.6	10.5
60 Years and Over	1.6	64.8	710	600	1,719	4,626	4,459	.089	7.6	9.2
Education of Householder										
Less than 13 Years	3.3	56.7	621	531	1,534	4,671	4,481	.087	7.4	6.2
13 to 16 Years	1.1	69.4	760	639	1,909	5,401	5,218	.074	6.2	6.9
17 Years or More	.2	63.9	700	618	1,989	4,837	4,744	.073	6.4	12.7
Race of Householder										
White	4.3	62.6	686	581	1,691	5,017	4,826	.081	6.8	5.3
Black	.3	24.4	267	274	1,010	2,522	2,423	.105	10.8	14.2
Other [5]	Q	Q	Q	Q	Q	Q	Q	Q	Q	NF

See footnotes at end of table.

Table 5.19. Liquefied Petroleum Gas Consumption and Expenditures for Main Space Heating, per U.S. Household, 1993 (Continued)

Characteristics	Households (million)	Consumption (million Btu)	Consumption (gallons)	Expenditures (dollars)	Heated Floorspace (square feet)	Annual Heating Degree-Days 1993	Annual Heating Degree-Days 30-Year Average [2]	Liquefied Petroleum Gas Space-Heating Intensity: Consumption (gallons/ HDD*1000 square feet)	Liquefied Petroleum Gas Space-Heating Intensity: Expenditures (cents/ HDD*1000 square feet)	RSE Row Factors
RSE Column Factors:	1.9	1.0 [1]	1.0 [1]	0.9 [1]	0.8	0.8	0.8	1.0 [1]	1.1 [1]	
Householder of Hispanic Descent										
Yes	0.2	34.7	380	358	1,363	3,196	3,180	0.087	8.2	21.4
No	4.4	61.1	669	569	1,653	4,921	4,729	.082	7.0	5.2
Household Size										
1 Person	.8	56.4	617	531	1,107	4,458	4,299	.125	10.8	10.2
2 Persons	1.8	61.4	673	579	1,777	4,685	4,537	.081	7.0	8.4
3 Persons	.8	58.8	644	552	1,659	4,699	4,500	.083	7.1	9.5
4 Persons	.6	60.0	657	571	1,661	5,530	5,265	.071	6.2	9.2
5 Persons	.4	65.3	715	562	1,909	5,458	5,232	.069	5.4	9.9
6 or More Persons	.2	54.1	592	480	2,019	5,178	4,947	.057	4.6	23.1
Main Heating Equipment Using LPG										
Central Warm-Air Furnace	2.9	66.6	730	615	1,806	5,491	5,284	.074	6.2	5.0
Room Heater/Other	1.7	48.2	528	462	1,348	3,708	3,562	.106	9.2	11.6
Age of Main Heating Equipment										
Less than 5 Years	1.7	60.3	660	563	1,747	4,923	4,706	.077	6.5	7.0
5 to 9 Years	1.1	55.1	604	510	1,656	5,204	5,037	.070	5.9	8.0
10 to 19 Years	.8	65.9	721	615	1,507	4,547	4,382	.105	9.0	8.8
20 Years or More	.7	65.2	714	598	1,675	4,481	4,332	.095	8.0	12.9
Don't Know	.2	43.8	479	460	1,128	4,693	4,484	.091	8.7	15.1
Secondary Heating Fuel (more than one may apply)										
No	1.9	58.5	641	549	1,782	4,762	4,566	.075	6.5	6.6
Yes	2.7	61.1	669	568	1,538	4,911	4,735	.089	7.5	6.4
Wood	.7	65.5	717	626	2,420	5,345	5,119	.055	4.8	9.0
Electricity	1.0	51.9	569	493	1,599	4,462	4,272	.080	6.9	8.4
Kerosene	.3	61.2	670	539	1,640	4,994	4,839	.082	6.6	12.5
Other	.3	85.8	940	810	2,340	4,589	4,364	.087	7.5	16.0
Average LPG Expenditures for Main Space Heat (dollars per gallon)										
Less than .75	.8	86.2	944	608	2,096	6,888	6,508	.065	4.2	10.0
1.00 or More	1.1	33.9	371	431	1,229	3,064	3,034	.099	11.4	8.5
Adequacy of Insulation										
Well Insulated	1.6	58.4	640	535	1,903	4,918	4,754	.068	5.7	9.0
Adequately Insulated	1.8	61.5	673	568	1,663	5,090	4,901	.080	6.7	7.3
Poorly Insulated	1.3	59.8	655	579	1,285	4,418	4,214	.115	10.2	8.3

[1] This factor is underestimated because it contains no error for estimating this end use.
[2] The 30-year average and climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[3] Does not include all new construction for 1993.
[4] Below 150 percent of poverty line or 60 percent of median State income.
[5] Includes some householders who described themselves as Hispanic rather than White, Black, or other.
NF = No applicable RSE row factor.
Q = Data withheld either because the Relative Standard Error (RSE) was greater than 50 percent or fewer than 10 households were sampled.
Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • See ''Glossary'' for definition of terms used in this report.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A-D of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.20. Electricity Consumption and Expenditures for All Air Conditioning and Central Air Conditioning, U.S. Households, 1993

Characteristics	Electricity Used for All Air Conditioning			Electricity Used for Central Air Conditioning [2]									RSE Row Factors
					per Household								
					Consumption				Annual Cooling Degree-Days		Electric Air-Conditioning Intensity		
	Households (million)	Total Consumption (quadrillion Btu)	Total Expenditures (billion dollars)	Households (million)	(million Btu)	(kWh)	Expenditures (dollars)	Cooled Floorspace (square feet)	1993	30-Year Average [3]	Consumption (kWh/CDD*1000 square feet)	Expenditures (cents/CDD*1000 square feet)	
RSE Column Factors:	1.0	1.4 [1]	1.4 [1]	1.4	0.9 [1]	0.9 [1]	1.0 [1]	0.7	0.8	0.8	0.8 [1]	0.8 [1]	
Total U.S. Households	**63.9**	**0.46**	**11.30**	**41.0**	**9.1**	**2,667**	**222**	**2,058**	**1,691**	**1,598**	**0.77**	**6.4**	**2.2**
Census Region and Division													
Northeast	10.9	.04	1.39	3.8	6.3	1,848	218	2,508	896	690	.82	9.7	6.5
New England	2.1	.01	.23	.6	6.7	1,951	209	2,746	730	521	.97	10.4	11.9
Middle Atlantic	8.8	.03	1.15	3.2	6.2	1,829	220	2,465	927	721	.80	9.6	7.3
Midwest	16.4	.08	1.90	10.5	6.0	1,772	143	2,372	851	873	.88	7.1	4.4
East North Central	10.8	.05	1.25	6.7	5.8	1,713	146	2,379	817	800	.88	7.5	5.6
West North Central	5.6	.03	.64	3.8	6.4	1,875	139	2,360	910	1,002	.87	6.5	6.3
South	29.4	.31	7.11	21.5	12.0	3,509	277	1,883	2,261	2,117	.82	6.5	2.7
South Atlantic	15.0	.14	3.45	11.1	10.9	3,186	262	1,895	2,283	2,071	.74	6.1	4.1
East South Central	5.3	.05	.97	3.4	11.7	3,439	216	2,080	1,793	1,671	.92	5.8	5.0
West South Central	9.2	.11	2.69	6.9	13.9	4,063	331	1,765	2,457	2,412	.94	7.6	4.7
West	7.1	.03	.91	5.1	5.5	1,597	162	1,811	1,624	1,587	.54	5.5	7.4
Mountain	2.1	.01	.36	1.7	7.9	2,310	212	1,634	2,816	2,690	.50	4.6	11.1
Pacific	5.1	.02	.55	3.5	4.3	1,259	138	1,895	1,059	1,063	.63	6.9	8.9
Largest Populated States													
California	4.4	.02	.53	3.2	4.3	1,273	146	1,824	1,134	1,135	.62	7.0	8.7
Florida	5.1	.06	1.44	4.4	12.4	3,634	302	1,798	3,145	3,072	.64	5.3	5.1
New York	3.9	.01	.50	1.1	5.9	1,732	248	2,610	806	633	.82	11.8	15.1
Texas	5.8	.07	1.65	4.4	13.9	4,062	330	1,838	2,608	2,564	.85	6.9	6.6
Urban Status													
Urban	50.2	.36	9.16	33.5	9.1	2,666	227	2,040	1,737	1,628	.75	6.4	2.6
Central City	18.9	.13	3.18	11.4	8.9	2,595	218	1,651	1,995	1,884	.79	6.6	4.1
Suburban	31.3	.24	5.98	22.1	9.2	2,703	232	2,240	1,604	1,497	.75	6.5	2.9
Rural	13.7	.10	2.14	7.4	9.1	2,673	201	2,137	1,488	1,461	.84	6.3	4.1
Climate Zone [3]													
Under 2,000 CDD and Over 7,000 HDD	4.0	.01	.26	2.2	4.0	1,162	87	2,727	456	564	.94	7.0	12.7
5,500 to 7,000 HDD	15.4	.06	1.66	8.7	5.6	1,650	143	2,239	815	780	.90	7.8	7.3
4,000 to 5,499 HDD	16.0	.10	2.57	9.0	8.4	2,448	210	2,333	1,292	1,134	.81	7.0	6.4
Under 4,000 HDD	10.3	.08	1.84	6.8	8.8	2,587	213	1,874	1,630	1,467	.85	7.0	8.1
2,000 CDD or More and Under 4,000 HDD	18.1	.21	4.98	14.2	12.6	3,702	305	1,756	2,702	2,615	.78	6.4	4.3
Type of Housing Unit													
Single-Family	45.1	.36	8.85	30.4	10.0	2,923	242	2,429	1,629	1,544	.74	6.1	2.7
Detached	39.9	.33	7.90	26.5	10.2	2,975	245	2,514	1,618	1,539	.73	6.0	2.8
Attached	5.2	.04	.95	3.8	8.7	2,562	220	1,836	1,706	1,576	.82	7.0	8.1
Mobile Home	3.7	.03	.82	2.3	11.2	3,287	267	1,090	1,697	1,656	1.78	14.4	7.8
Multifamily	15.1	.06	1.63	8.3	5.3	1,567	139	968	1,917	1,778	.84	7.5	5.9
2 to 4 Units	3.9	.02	.43	1.3	6.6	1,921	176	1,176	1,874	1,776	.87	8.0	9.9
5 or More Units	11.2	.04	1.20	7.0	5.1	1,501	132	930	1,925	1,779	.84	7.4	6.7

See footnotes at end of table.

Table 5.20. Electricity Consumption and Expenditures for All Air Conditioning and Central Air Conditioning, U.S. Households, 1993 (Continued)

Characteristics	Electricity Used for All Air Conditioning			Electricity Used for Central Air Conditioning [2]									
					per Household								
					Consumption				Annual Cooling Degree-Days		Electric Air-Conditioning Intensity		
	Households (million)	Total Consumption (quadrillion Btu)	Total Expenditures (billion dollars)	Households (million)	(million Btu)	(kWh)	Expenditures (dollars)	Cooled Floorspace (square feet)	1993	30-Year Average [3]	Consumption (kWh/CDD*1000 square feet)	Expenditures (cents/CDD*1000 square feet)	RSE Row Factors
RSE Column Factors:	1.0	1.4 [1]	1.4 [1]	1.4	0.9 [1]	0.9 [1]	1.0 [1]	0.7	0.8	0.8	0.8 [1]	0.8 [1]	
Heated Floorspace (square feet)													
Fewer than 1,000	17.1	0.08	2.03	8.2	6.1	1,797	151	835	1,888	1,765	1.14	9.6	4.5
1,000 to 1,999	27.4	.20	5.03	18.3	9.1	2,670	222	1,674	1,808	1,718	.88	7.3	2.9
2,000 to 2,999	12.8	.11	2.60	9.3	10.2	2,991	247	2,684	1,530	1,446	.73	6.0	3.8
3,000 or More	6.6	.07	1.64	5.1	11.9	3,475	293	4,267	1,250	1,174	.65	5.5	6.2
Total Number of Rooms (Excluding Bathrooms)													
1 or 2	1.6	(*)	.13	.5	5.1	1,484	118	627	2,393	2,232	.99	7.9	14.9
3 to 5	30.3	.17	4.23	17.9	7.0	2,065	173	1,330	1,792	1,693	.87	7.3	3.6
6 to 8	27.7	.23	5.69	19.0	10.4	3,062	252	2,491	1,637	1,547	.75	6.2	3.1
9 or More	4.3	.05	1.25	3.5	13.0	3,806	330	3,670	1,366	1,286	.76	6.6	7.5
Ownership of Unit													
Owned	44.2	.36	8.78	30.1	10.0	2,932	243	2,381	1,629	1,545	.76	6.3	2.5
Rented	19.7	.10	2.52	10.8	6.6	1,930	164	1,158	1,866	1,744	.89	7.6	4.6
Public Housing	2.2	.01	.18	1.0	4.0	1,177	97	739	1,849	1,704	.86	7.1	14.0
Not Public Housing	17.5	.09	2.35	9.8	6.8	2,005	171	1,200	1,868	1,748	.89	7.6	4.7
Rent Subsidy	1.1	(*)	.11	.5	5.2	1,527	129	985	1,425	1,254	1.09	9.2	15.7
No Rent Subsidy	16.4	.09	2.24	9.3	6.9	2,031	173	1,212	1,892	1,774	.89	7.5	4.9
Year of Construction													
1939 or Before	9.9	.04	1.10	2.5	8.1	2,384	197	2,473	1,198	1,169	.80	6.6	7.3
1940 to 1949	3.8	.02	.50	1.5	6.8	1,988	166	1,989	1,287	1,195	.78	6.5	9.0
1950 to 1959	8.4	.06	1.53	4.6	8.7	2,548	236	2,208	1,591	1,488	.73	6.7	6.2
1960 to 1969	10.5	.07	1.84	6.7	9.1	2,657	223	2,112	1,587	1,499	.79	6.6	5.1
1970 to 1979	12.4	.10	2.32	8.8	9.5	2,784	224	1,900	1,796	1,706	.82	6.6	4.5
1980 to 1984	6.7	.06	1.45	5.7	9.9	2,887	239	1,805	1,952	1,844	.82	6.8	5.2
1985 to 1987	4.7	.04	1.04	4.1	9.8	2,867	240	1,985	1,870	1,743	.77	6.5	7.6
1988 to 1990	3.8	.03	.77	3.4	8.9	2,596	213	2,159	1,635	1,537	.74	6.0	6.1
1991 to 1993 [4]	3.8	.03	.74	3.6	8.6	2,526	205	2,281	1,710	1,626	.65	5.3	8.6
Electric Air-Conditioning Paid by Household													
Yes	62.6	.45	11.15	39.6	9.2	2,709	226	2,094	1,689	1,597	.77	6.4	2.3
No	1.3	.01	.15	1.3	4.8	1,420	115	978	1,760	1,632	.82	6.7	14.5
1993 Family Income													
Less than $5,000	2.4	.01	.33	1.1	6.7	1,963	168	1,098	1,974	1,829	.91	7.7	11.7
$5,000 to $9,999	6.1	.03	.68	2.7	6.6	1,934	157	1,228	1,851	1,750	.85	6.9	7.7
$10,000 to $14,999	6.3	.03	.74	3.1	6.0	1,763	149	1,475	1,790	1,679	.67	5.7	5.7
$15,000 to $19,999	6.0	.04	.91	3.3	7.8	2,296	191	1,641	1,772	1,687	.79	6.6	5.9
$20,000 to $24,999	5.5	.04	.88	3.4	7.7	2,257	190	1,664	1,683	1,614	.81	6.8	5.5
$25,000 to $34,999	9.7	.07	1.73	6.7	9.1	2,653	218	1,918	1,684	1,592	.82	6.8	4.5
$35,000 to $49,999	12.4	.10	2.37	8.4	9.8	2,863	233	2,181	1,731	1,652	.76	6.2	3.8
$50,000 to $74,999	9.0	.08	1.93	7.1	10.2	3,002	245	2,449	1,604	1,511	.76	6.2	4.4
$75,000 or More	6.5	.07	1.74	5.2	11.9	3,483	309	3,007	1,511	1,392	.77	6.8	6.2

See footnotes at end of table.

Table 5.20. Electricity Consumption and Expenditures for All Air Conditioning and Central Air Conditioning, U.S. Households, 1993 (Continued)

Characteristics	Electricity Used for All Air Conditioning			Electricity Used for Central Air Conditioning [2]										RSE Row Factors
					per Household									
					Consumption				Annual Cooling Degree-Days		Electric Air-Conditioning Intensity			
	Households (million)	Total Consumption (quadrillion Btu)	Total Expenditures (billion dollars)	Households (million)	(million Btu)	(kWh)	Expenditures (dollars)	Cooled Floorspace (square feet)	1993	30-Year Average [3]	Consumption (kWh/CDD*1000 square feet)	Expenditures (cents/CDD*1000 square feet)		
RSE Column Factors:	1.0	1.4 [1]	1.4 [1]	1.4	0.9 [1]	0.9 [1]	1.0 [1]	0.7	0.8	0.8	0.8 [1]	0.8 [1]		
Below Poverty Line														
100 Percent	7.8	0.04	1.00	3.2	7.0	2,043	171	1,200	1,933	1,827	0.88	7.4	6.7	
125 Percent	11.0	.06	1.38	4.5	6.8	1,986	167	1,282	1,810	1,709	.86	7.2	5.7	
150 Percent	14.4	.08	1.92	6.4	7.4	2,161	179	1,355	1,881	1,771	.85	7.0	5.4	
Eligible for Federal Assistance [5]	**17.6**	**.09**	**2.26**	**8.0**	**7.0**	**2,043**	**171**	**1,415**	**1,826**	**1,712**	**.79**	**6.6**	**5.0**	
Age of Householder														
Under 25 Years	3.2	.02	.49	2.2	7.2	2,125	176	1,166	1,973	1,844	.92	7.6	9.0	
25 to 34 Years	13.3	.09	2.21	8.6	8.3	2,443	205	1,725	1,740	1,638	.81	6.8	3.7	
35 to 44 Years	14.2	.12	2.86	9.6	10.2	3,000	247	2,186	1,673	1,571	.82	6.7	3.4	
45 to 59 Years	14.7	.13	3.12	9.3	11.0	3,226	268	2,384	1,640	1,540	.83	6.9	3.8	
60 Years and Over	18.5	.10	2.62	11.2	7.5	2,195	186	2,109	1,656	1,588	.63	5.3	4.7	
Education of Householder														
Less than 13 Years	32.5	.21	4.99	17.8	8.4	2,464	201	1,831	1,644	1,559	.82	6.7	2.9	
13 to 16 Years	23.2	.18	4.60	17.0	9.5	2,787	236	2,158	1,726	1,631	.75	6.3	2.9	
17 Years or More	8.2	.07	1.71	6.1	10.0	2,923	250	2,439	1,732	1,620	.69	5.9	5.2	
Race of Householder														
White	54.4	.40	9.79	35.8	9.2	2,696	225	2,149	1,661	1,575	.76	6.3	2.3	
Black	6.7	.04	1.09	3.5	8.8	2,579	211	1,395	1,916	1,732	.96	7.9	6.4	
Other [6]	2.8	.02	.42	1.7	7.7	2,242	199	1,494	1,879	1,800	.80	7.1	10.3	
Householder of Hispanic Descent														
Yes	4.3	.03	.72	2.5	8.6	2,507	219	1,732	2,040	1,934	.71	6.2	8.4	
No	59.6	.43	10.58	38.4	9.1	2,678	223	2,079	1,669	1,576	.77	6.4	2.5	
Household Size														
1 Person	14.9	.07	1.78	8.9	6.1	1,791	153	1,471	1,729	1,631	.70	6.0	4.1	
2 Persons	21.8	.15	3.77	14.5	8.8	2,579	212	2,132	1,667	1,569	.73	6.0	3.2	
3 Persons	11.1	.09	2.23	7.1	10.3	3,032	252	2,050	1,769	1,669	.84	6.9	3.9	
4 Persons	9.9	.08	2.08	6.6	10.8	3,153	263	2,395	1,632	1,557	.81	6.7	3.8	
5 Persons	4.2	.04	.96	2.8	11.2	3,283	274	2,527	1,600	1,515	.81	6.8	5.9	
6 or More Persons	1.9	.02	.48	1.1	13.8	4,043	350	2,624	1,795	1,712	.86	7.4	10.9	
Cooling Degree-Days (CDD)-1993														
2,000 or More	17.0	.20	4.84	13.5	13.0	3,815	314	1,726	2,852	2,722	.77	6.4	4.3	
1,000 to 1,999	24.4	.18	4.30	16.0	8.8	2,578	210	2,070	1,455	1,323	.86	7.0	5.0	
500 to 999	17.4	.07	1.89	8.5	5.5	1,620	152	2,398	764	714	.88	8.3	5.6	
Fewer than 500	5.0	.01	.28	3.0	3.2	927	75	2,531	342	498	1.07	8.6	7.5	
Average Electricity Expenditures (cents per kWh)														
Less than 6	5.1	.04	.64	3.4	9.9	2,890	158	2,372	1,235	1,182	.99	5.4	9.2	
6 to Less than 9	33.2	.29	6.60	23.0	10.4	3,062	237	2,057	1,865	1,772	.80	6.2	3.6	
9 or More	25.6	.13	4.06	14.5	6.8	1,991	215	1,987	1,524	1,418	.66	7.1	4.7	

See footnotes at end of table.

Table 5.20. Electricity Consumption and Expenditures for All Air Conditioning and Central Air Conditioning, U.S. Households, 1993 (Continued)

Characteristics	Electricity Used for All Air Conditioning			Electricity Used for Central Air Conditioning [2]									
					per Household								
					Consumption				Annual Cooling Degree-Days		Electric Air-Conditioning Intensity		
	Households (million)	Total Consumption (quadrillion Btu)	Total Expenditures (billion dollars)	Households (million)	(million Btu)	(kWh)	Expenditures (dollars)	Cooled Floorspace (square feet)	1993	30-Year Average [3]	Consumption (kWh/CDD*1000 square feet)	Expenditures (cents/CDD*1000 square feet)	RSE Row Factors
RSE Column Factors:	1.0	1.4 [1]	1.4 [1]	1.4	0.9 [1]	0.9 [1]	1.0 [1]	0.7	0.8	0.8	0.8 [1]	0.8 [1]	
Number of Rooms Air Conditioned													
1 to 3	18.5	0.05	1.40	4.1	4.5	1,327	114	753	1,923	1,793	0.92	7.9	4.8
4 to 6	31.1	Q	5.77	23.7	8.3	2,439	202	1,730	1,732	1,647	.81	6.7	3.0
7 or More	14.4	.17	4.13	13.2	11.9	3,487	292	3,044	1,547	1,450	.74	6.2	3.8
Frequency of Use of Air Conditioning [7]													
Only a Few Times	25.3	.07	1.95	12.8	3.9	1,154	104	2,020	1,295	1,246	.44	4.0	3.2
Quite a Bit	14.7	.10	2.62	8.9	8.1	2,369	208	2,085	1,517	1,414	.75	6.6	3.9
All Summer	23.8	.28	6.72	19.3	13.0	3,809	308	2,070	2,035	1,916	.90	7.3	2.7
Age of Air Conditioning Equipment [7]													
Less than 5 Years	18.8	.13	3.19	11.7	8.6	2,506	209	2,223	1,655	1,564	.68	5.7	3.7
5 to 9 Years	17.4	.13	3.20	10.4	10.0	2,932	242	2,208	1,703	1,603	.78	6.4	4.1
10 or More Years	19.6	.15	3.68	13.3	9.6	2,800	236	2,156	1,628	1,548	.80	6.7	3.9
Don't Know	7.2	.05	1.12	4.7	8.0	2,354	195	1,224	1,971	1,855	.98	8.1	5.9

[1] This factor is underestimated because it contains no error for estimating this end use.

[2] An estimated 1.7 million households have a central air conditioner and one or more room air conditioners. These households are included only under central air conditioners and not included under room air conditioners.

[3] The 30-year average and climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.

[4] Does not include all new construction for 1993.

[5] Below 150 percent of poverty line or 60 percent of median State income.

[6] Includes some householders who described themselves as Hispanic rather than White, Black, or other.

[7] If a household has both a central and room air conditioner then the usage and age of the equipment is presented only for the central unit.

(*) = Value rounds to zero in the units displayed.

Q = Data withheld either because the Relative Standard Error (RSE) was greater than 50 percent or fewer than 10 households were sampled.

Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • This table reflects only those households that used their air conditioning equipment. • See ''Glossary'' for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A, B, C, and E of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.21. Electricity Consumption and Expenditures for Room Air Conditioning, per U.S. Household, 1993

Characteristics	Households (million)	Consumption (million Btu)	Consumption (kWh)	Expenditures (dollars)	Cooled Floorspace (square feet)	Annual Cooling Degree-Days 1993	Annual Cooling Degree-Days 30-Year Average [2]	Electric Air-Conditioning Intensity Consumption (kWh/ CDD*1000 square feet)	Electric Air-Conditioning Intensity Expenditures (cents/ CDD*1000 square feet)	RSE Row Factors
RSE Column Factors:	1.3	1.1 [1]	1.1 [1]	1.1 [1]	0.9	0.8	0.9	0.9 [1]	1.0 [1]	
Total U.S. Households	**22.9**	**3.6**	**1,067**	**95**	**954**	**1,296**	**1,186**	**0.86**	**7.7**	**3.6**
Census Region and Division										
Northeast	7.1	2.1	624	78	909	951	748	.72	9.0	5.0
New England	1.5	2.1	606	69	911	770	556	.86	9.9	8.2
Middle Atlantic	5.6	2.1	629	80	908	1,000	800	.69	8.8	5.9
Midwest	5.9	2.7	783	66	1,092	775	783	.93	7.8	5.1
East North Central	4.1	2.7	783	68	1,132	768	729	.90	7.8	6.7
West North Central	1.8	2.7	785	60	1,001	792	906	.99	7.6	5.2
South	7.9	6.3	1,838	146	945	2,083	1,931	.93	7.4	4.9
South Atlantic	3.8	5.7	1,683	140	880	2,061	1,810	.93	7.7	7.7
East South Central	1.8	6.5	1,904	125	1,075	1,731	1,626	1.02	6.7	6.4
West South Central	2.3	7.0	2,044	172	950	2,397	2,370	.90	7.6	8.4
West	2.0	1.4	417	41	749	928	974	.60	5.9	9.9
Mountain	.4	1.4	406	33	674	846	988	.71	5.7	22.9
Pacific	1.6	1.4	420	43	769	951	971	.57	5.9	11.2
Largest Populated States										
California	1.2	1.5	443	49	765	1,030	1,033	.56	6.2	11.9
Florida	.8	6.3	1,841	159	720	3,651	3,433	.70	6.0	15.7
New York	2.8	1.8	518	81	736	1,042	861	.67	10.6	5.4
Texas	1.4	6.3	1,843	152	854	2,589	2,568	.83	6.9	12.1
Urban Status										
Urban	16.6	3.3	969	92	908	1,314	1,171	.81	7.7	4.5
Central City	7.5	3.3	962	93	788	1,448	1,295	.84	8.2	6.2
Suburban	9.1	3.3	975	91	1,007	1,204	1,069	.80	7.5	5.7
Rural	6.2	4.5	1,328	103	1,075	1,247	1,226	.99	7.7	5.6
Climate Zone [2]										
Under 2,000 CDD and Over 7,000 HDD	1.8	1.5	438	34	1,093	420	509	.95	7.4	11.0
5,500 to 7,000 HDD	6.7	2.3	661	62	946	754	661	.93	8.6	5.3
4,000 to 5,499 HDD	7.0	3.3	981	97	1,036	1,162	1,004	.82	8.0	5.5
Under 4,000 HDD	3.5	4.7	1,372	113	846	1,601	1,462	1.01	8.3	8.8
2,000 CDD or More and Under 4,000 HDD	3.8	6.7	1,959	162	851	2,632	2,515	.88	7.3	6.8
Type of Housing Unit										
Single-Family	14.7	4.0	1,187	101	1,129	1,334	1,232	.79	6.7	4.2
Detached	13.3	4.2	1,229	104	1,169	1,334	1,245	.79	6.6	4.4
Attached	1.4	2.6	770	78	739	1,325	1,096	.79	8.0	11.4
Mobile Home	1.5	6.4	1,885	150	649	1,297	1,209	2.24	17.8	8.2
Multifamily	6.8	2.2	633	69	640	1,214	1,083	.81	8.9	5.8
2 to 4 Units	2.6	2.5	723	77	752	1,329	1,168	.72	7.7	8.4
5 or More Units	4.2	2.0	577	65	571	1,143	1,030	.88	9.9	7.1
Heated Floorspace (square feet)										
Fewer than 1,000	8.9	3.3	975	88	556	1,470	1,339	1.19	10.8	5.0
1,000 to 1,999	9.1	4.1	1,202	105	1,018	1,299	1,211	.91	7.9	4.5
2,000 to 2,999	3.4	3.2	926	87	1,315	967	869	.73	6.9	5.6
3,000 or More	1.5	3.8	1,122	96	2,124	996	858	.53	4.5	10.2
Total Number of Rooms (Excluding Bathrooms)										
1 or 2	1.1	2.0	584	64	448	1,304	1,162	1.00	10.9	9.6
3 to 5	12.4	3.5	1,018	91	776	1,333	1,223	.98	8.8	4.1
6 to 8	8.6	4.0	1,164	102	1,194	1,247	1,140	.78	6.9	4.6
9 or More	.8	4.8	1,403	121	1,758	1,236	1,147	.65	5.5	14.8

See footnotes at end of table.

Table 5.21. Electricity Consumption and Expenditures for Room Air Conditioning, per U.S. Household, 1993 (Continued)

Characteristics	Households (million)	Consumption (million Btu)	Consumption (kWh)	Expenditures (dollars)	Cooled Floorspace (square feet)	Annual Cooling Degree-Days 1993	Annual Cooling Degree-Days 30-Year Average [2]	Electric Air-Conditioning Intensity Consumption (kWh/ CDD*1000 square feet)	Electric Air-Conditioning Intensity Expenditures (cents/ CDD*1000 square feet)	RSE Row Factors
RSE Column Factors:	1.3	1.1 [1]	1.1 [1]	1.1 [1]	0.9	0.8	0.9	0.9 [1]	1.0 [1]	
Ownership of Unit										
Owned	14.0	4.0	1,180	102	1,151	1,242	1,149	0.83	7.1	3.9
Rented	8.9	3.0	890	85	644	1,380	1,244	1.00	9.5	5.4
Public Housing	1.2	2.6	762	65	495	1,446	1,268	1.07	9.1	10.0
Not Public Housing	7.6	3.1	911	88	668	1,369	1,240	.99	9.6	5.8
Rent Subsidy	.6	2.3	686	69	603	1,289	1,183	.88	8.9	16.8
No Rent Subsidy	7.0	3.2	930	89	674	1,376	1,245	1.00	9.6	6.0
Year of Construction										
1939 or Before	7.3	3.0	889	82	1,056	1,137	1,047	.74	6.8	5.5
1940 to 1949	2.3	4.3	1,261	111	977	1,458	1,322	.89	7.8	7.7
1950 to 1959	3.7	4.4	1,283	115	970	1,451	1,315	.91	8.2	7.3
1960 to 1969	3.8	3.5	1,027	92	859	1,402	1,246	.85	7.6	7.6
1970 to 1979	3.5	3.7	1,091	95	862	1,210	1,152	1.05	9.1	7.8
1980 to 1984	1.0	3.7	1,079	92	926	1,343	1,241	.87	7.4	11.7
1985 to 1987	.5	4.1	1,192	98	927	1,527	1,402	.84	6.9	16.4
1988 to 1990	.4	4.5	1,308	103	791	1,045	928	1.58	12.5	16.0
1991 to 1993 [3]	.2	2.9	835	63	662	1,470	1,432	Q	Q	27.6
Electric Air-Conditioning Paid by Household										
Yes	21.4	3.7	1,089	97	985	1,287	1,183	.86	7.6	3.9
No	1.5	2.5	747	70	501	1,424	1,234	1.05	9.8	8.9
1993 Family Income										
Less than $5,000	1.3	4.0	1,162	107	624	1,576	1,421	1.18	10.9	8.2
$5,000 to $9,999	3.4	3.1	898	78	708	1,414	1,328	.90	7.7	6.7
$10,000 to $14,999	3.2	3.5	1,021	87	809	1,463	1,363	.86	7.4	6.4
$15,000 to $19,999	2.7	4.1	1,203	101	1,002	1,463	1,345	.82	6.9	9.2
$20,000 to $24,999	2.1	4.3	1,263	108	888	1,320	1,226	1.08	9.2	8.2
$25,000 to $34,999	2.9	3.4	1,010	89	1,002	1,154	1,061	.87	7.7	6.6
$35,000 to $49,999	4.0	3.7	1,085	101	1,147	1,131	1,010	.84	7.8	7.1
$50,000 to $74,999	2.0	3.6	1,054	98	1,162	1,036	913	.88	8.2	7.4
$75,000 or More	1.3	3.5	1,017	103	1,297	1,117	977	.70	7.1	11.8
Below Poverty Line										
100 Percent	4.7	3.8	1,107	97	671	1,581	1,467	1.04	9.1	5.1
125 Percent	6.4	3.8	1,107	96	718	1,541	1,437	1.00	8.7	4.8
150 Percent	8.0	3.9	1,130	97	744	1,535	1,430	.99	8.5	4.5
Eligible for Federal Assistance [4]	**9.6**	**3.6**	**1,061**	**92**	**779**	**1,454**	**1,346**	**.94**	**8.1**	**4.3**
Age of Householder										
Under 25 Years	1.0	3.7	1,070	93	685	1,418	1,329	1.10	9.6	11.4
25 to 34 Years	4.7	3.7	1,081	98	791	1,307	1,203	1.05	9.5	6.0
35 to 44 Years	4.5	4.0	1,166	106	969	1,349	1,211	.89	8.1	6.4
45 to 59 Years	5.3	4.4	1,299	113	1,111	1,282	1,179	.91	7.9	5.6
60 Years and Over	7.3	2.8	827	73	971	1,250	1,146	.68	6.0	5.0
Education of Householder										
Less than 13 Years	14.6	3.8	1,119	96	883	1,382	1,271	.92	7.9	4.0
13 to 16 Years	6.2	3.4	1,002	94	1,057	1,141	1,042	.83	7.8	5.3
17 Years or More	2.1	3.1	896	88	1,149	1,152	1,016	.68	6.7	9.1
Race of Householder										
White	18.6	3.6	1,057	93	1,021	1,218	1,116	.85	7.5	4.0
Black	3.2	4.2	1,221	108	665	1,710	1,540	1.07	9.5	6.2
Other [5]	1.1	2.7	788	81	646	1,420	1,349	.86	8.9	12.5

See footnotes at end of table.

Table 5.21. Electricity Consumption and Expenditures for Room Air Conditioning, per U.S. Household, 1993 (Continued)

Characteristics	Households (million)	Consumption (million Btu)	Consumption (kWh)	Expenditures (dollars)	Cooled Floorspace (square feet)	Annual Cooling Degree-Days 1993	Annual Cooling Degree-Days 30-Year Average [2]	Electric Air-Conditioning Intensity Consumption (kWh/ CDD*1000 square feet)	Electric Air-Conditioning Intensity Expenditures (cents/ CDD*1000 square feet)	RSE Row Factors
RSE Column Factors:	1.3	1.1 [1]	1.1 [1]	1.1 [1]	0.9	0.8	0.9	0.9 [1]	1.0 [1]	
Householder of Hispanic Descent										
Yes	1.8	3.4	996	96	695	1,873	1,740	0.77	7.4	12.2
No	21.1	3.7	1,073	95	976	1,247	1,140	.88	7.8	3.4
Household Size										
1 Person	6.0	2.7	780	71	783	1,273	1,169	.78	7.1	5.6
2 Persons	7.3	3.6	1,045	93	1,017	1,317	1,208	.78	7.0	4.8
3 Persons	4.0	4.4	1,278	112	1,059	1,306	1,170	.92	8.1	7.1
4 Persons	3.3	4.0	1,171	106	988	1,208	1,103	.98	8.9	7.3
5 Persons	1.4	5.2	1,515	127	1,014	1,442	1,356	1.04	8.7	9.0
6 or More Persons	.8	4.0	1,167	106	895	1,333	1,248	.98	8.8	13.0
Cooling Degree-Days (CDD)-1993										
2,000 or More	3.5	7.0	2,056	170	826	2,798	2,637	.89	7.4	6.8
1,000 to 1,999	8.4	4.2	1,220	110	937	1,453	1,296	.90	8.1	4.7
500 to 999	8.9	2.4	707	67	1,011	782	680	.89	8.5	4.8
Fewer than 500	2.1	1.1	322	27	993	327	458	.99	8.2	7.3
Average Electricity Expenditures (cents per kWh)										
Less than 6	1.6	3.9	1,143	63	909	950	960	1.32	7.3	11.2
6 to Less than 9	10.1	4.9	1,448	112	1,081	1,492	1,403	.90	7.0	5.3
9 or More	11.1	2.4	708	84	844	1,168	1,022	.72	8.5	4.8
Number of Rooms Air Conditioned										
1 Room	4.8	1.5	436	44	308	1,176	1,039	1.21	12.3	4.3
2 Rooms	5.4	2.5	718	69	606	1,274	1,155	.93	8.9	4.1
3 or More	12.7	5.0	1,456	125	1,348	1,351	1,255	.80	6.9	4.3
Frequency of Use of Air Conditioning										
Only a Few Times	12.5	1.8	524	50	920	1,107	1,016	.51	4.9	3.9
Quite a Bit	5.8	4.9	1,430	132	978	1,385	1,257	1.06	9.8	4.7
All Summer	4.6	7.2	2,097	172	1,016	1,702	1,562	1.21	9.9	5.6
Age of Air Conditioning Equipment										
Less than 5 Years	7.1	4.1	1,189	105	908	1,420	1,282	.92	8.2	5.6
5 to 9 Years	6.9	3.7	1,092	98	1,023	1,276	1,166	.84	7.5	5.0
10 or More Years	6.3	3.3	980	87	1,039	1,158	1,075	.81	7.2	5.5
Don't Know	2.5	3.0	875	79	679	1,348	1,249	.96	8.6	8.1
Number of Room Air Conditioners										
1	14.8	3.0	894	79	763	1,239	1,141	.95	8.4	3.5
2	6.0	4.2	1,237	110	1,163	1,363	1,237	.78	7.0	6.3
3 or More	2.1	6.2	1,820	164	1,718	1,512	1,362	.70	6.3	7.8

[1] This factor is underestimated because it contains no error for estimating this end use.
[2] The 30-year average and climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[3] Does not include all new construction for 1993.
[4] Below 150 percent of poverty line or 60 percent of median State income.
[5] Includes some householders who described themselves as Hispanic rather than White, Black, or other.
Q = Data withheld either because the Relative Standard Error (RSE) was greater than 50 percent or fewer than 10 households were sampled.
Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • This table reflects only those households that used their air conditioning equipment. • See ''Glossary'' for definition of terms used in this report.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A, B, C, and E of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.22. Total Electricity and Natural Gas Consumption and Expenditures for Water Heating in U.S. Households, 1993

Characteristics	Electricity				Natural Gas				RSE Row Factors
		Total Consumed				Total Consumed			
	Households (million)	(quadrillion Btu)	(billion kWh)	Total Expenditures (billion dollars)	Households (million)	(quadrillion Btu)	(billion cubic feet)	Total Expenditures (billion dollars)	
RSE Column Factors:	1.0	1.1 [1]	1.1 [1]	1.1 [1]	0.9	0.9 [1]	0.9 [1]	0.9 [1]	
Total U.S. Households	**37.3**	**0.34**	**99**	**7.58**	**51.5**	**1.31**	**1,276**	**8.08**	**3.5**
Census Region and Division									
Northeast	4.6	.04	13	1.31	10.1	.26	252	2.04	11.7
New England	1.4	.01	4	.44	1.9	.05	46	.41	21.6
Middle Atlantic	3.1	.03	9	.86	8.3	.21	206	1.64	14.5
Midwest	6.9	.07	21	1.54	15.4	.43	418	2.31	7.8
East North Central	4.2	.04	12	.94	11.7	.33	323	1.79	8.3
West North Central	2.7	.03	8	.60	3.7	.10	95	.52	15.6
South	19.4	.17	49	3.67	12.7	.33	317	2.01	5.4
South Atlantic	12.1	.10	28	2.27	4.4	.11	107	.81	6.2
East South Central	3.9	.04	11	.70	1.8	.05	47	.27	19.1
West South Central	3.3	.03	9	.70	6.5	.17	163	.93	10.5
West	6.5	.06	17	1.07	13.3	.30	290	1.72	5.5
Mountain	1.9	.02	5	.36	3.2	.08	79	.41	12.4
Pacific	4.6	.04	12	.71	10.1	.22	210	1.31	5.9
Largest Populated States									
California	1.5	.01	3	.27	9.4	.19	189	1.19	8.0
Florida	4.9	.03	9	.78	.4	.01	7	.07	9.5
New York	1.1	.01	3	.35	3.8	.10	97	.84	32.5
Texas	2.3	.02	6	.47	3.9	.10	94	.54	16.0
Urban Status									
Urban	24.9	.21	62	4.91	45.5	1.15	1,122	7.21	4.0
Central City	8.6	.07	20	1.54	20.1	.51	496	3.27	6.6
Suburban	16.3	.15	43	3.37	25.4	.64	627	3.94	4.9
Rural	12.5	.12	37	2.68	6.0	.16	154	.88	8.9
Climate Zone [2]									
Under 2,000 CDD and Over 7,000 HDD	3.8	.04	12	.91	3.8	.10	98	.54	22.1
5,500 to 7,000 HDD	7.5	.08	23	1.75	16.8	.46	447	2.72	13.1
4,000 to 5,499 HDD	8.8	.08	25	1.76	10.6	.28	273	1.95	10.8
Under 4,000 HDD	6.3	.05	15	1.19	11.1	.25	245	1.56	13.2
2,000 CDD or More and Under 4,000 HDD	10.9	.08	24	1.97	9.4	.22	213	1.30	8.5
Total Number of Rooms (Excluding Bathrooms)									
1 or 2	1.0	.01	2	.13	1.8	.03	29	.21	16.7
3 to 5	20.4	.17	49	3.78	23.3	.54	528	3.38	4.8
6 to 8	14.3	.15	43	3.27	22.7	.62	605	3.78	4.9
9 or More	1.6	.02	5	.40	3.7	.12	114	.72	11.7
Type of Housing Unit									
Single-Family	24.5	.24	70	5.26	37.1	.97	944	5.86	4.0
Detached	21.8	.22	64	4.76	32.7	.86	837	5.14	4.4
Attached	2.6	.02	6	.50	4.4	.11	107	.72	13.1
Mobile Home	4.0	.04	11	.88	1.1	.03	26	.15	15.1
Multifamily	8.9	.06	18	1.45	13.3	.32	307	2.07	7.6
2 to 4 Units	2.5	.02	5	.43	4.9	.13	130	.89	12.3
5 or More Units	6.3	.04	13	1.02	8.4	.18	177	1.19	9.5
Heated Floorspace (square feet)									
Fewer than 1,000	12.5	.09	28	2.17	14.4	.31	304	2.00	5.4
1,000 to 1,999	15.4	.14	42	3.18	21.8	.55	539	3.39	4.9
2,000 to 2,999	6.4	.07	19	1.48	10.0	.28	275	1.73	6.2
3,000 or More	3.0	.03	10	.75	5.3	.16	158	.96	9.1

See footnotes at end of table.

Table 5.22. Total Electricity and Natural Gas Consumption and Expenditures for Water Heating in U.S. Households, 1993 (Continued)

Characteristics	Electricity				Natural Gas				RSE Row Factors
		Total Consumed				Total Consumed			
	Households (million)	(quadrillion Btu)	(billion kWh)	Total Expenditures (billion dollars)	Households (million)	(quadrillion Btu)	(billion cubic feet)	Total Expenditures (billion dollars)	
RSE Column Factors:	1.0	1.1 [1]	1.1 [1]	1.1 [1]	0.9	0.9 [1]	0.9 [1]	0.9 [1]	
Ownership of Unit									
Owned	24.8	0.23	69	5.22	33.1	0.86	841	5.25	4.1
Rented	12.5	.10	30	2.36	18.4	.45	436	2.83	5.4
Public Housing	1.4	.01	3	.23	1.8	.04	41	.26	18.3
Not Public Housing	11.1	.09	27	2.13	16.6	.41	395	2.57	5.7
Rent Subsidy	.6	(*)	1	.09	1.2	.03	28	.19	16.5
No Rent Subsidy	10.6	.09	26	2.04	15.4	.38	367	2.38	5.9
Year of Construction									
1939 or Before	5.2	.05	14	1.13	12.4	.32	307	2.01	7.9
1940 to 1949	2.1	.02	6	.41	4.2	.10	99	.65	10.2
1950 to 1959	3.6	.03	9	.74	8.3	.21	205	1.32	8.1
1960 to 1969	4.9	.04	12	.93	9.1	.22	217	1.34	7.9
1970 to 1979	9.3	.09	25	1.87	7.6	.20	190	1.14	7.0
1980 to 1984	4.5	.04	12	.93	3.7	.09	92	.57	8.5
1985 to 1987	2.9	.03	8	.60	2.3	.06	61	.39	12.2
1988 to 1990	2.7	.03	8	.59	1.8	.05	49	.30	11.6
1991 to 1993 [2]	2.1	.02	5	.39	2.1	.06	56	.36	16.1
Electric Water-Heating Paid by Household	**35.3**	**.33**	**95**	**7.27**	--	--	--	--	**3.4**
Natural Gas Water-Heating Paid by Household	--	--	--	--	**42.0**	**1.09**	**1,061**	**6.67**	**4.2**
1993 Family Income									
Less than $5,000	1.6	.01	4	.28	2.1	.05	49	.33	13.0
$5,000 to $9,999	4.0	.03	8	.64	5.5	.12	116	.73	8.4
$10,000 to $14,999	4.3	.03	10	.79	6.0	.14	134	.85	7.4
$15,000 to $19,999	4.2	.04	10	.79	4.9	.11	112	.69	8.6
$20,000 to $24,999	3.7	.03	9	.70	4.3	.10	97	.61	7.6
$25,000 to $34,999	6.2	.06	17	1.25	6.7	.17	165	1.03	6.3
$35,000 to $49,999	6.7	.07	19	1.51	9.4	.25	247	1.57	6.1
$50,000 to $74,999	4.4	.05	14	1.05	7.2	.21	200	1.26	6.7
$75,000 or More	2.4	.03	7	.58	5.3	.16	156	1.01	9.9
Below Poverty Line									
100 Percent	5.4	.05	14	1.10	7.6	.20	191	1.22	7.2
125 Percent	7.5	.07	20	1.54	10.0	.26	250	1.60	6.2
150 Percent	9.8	.09	26	2.03	12.7	.32	314	2.00	5.4
Eligible for Federal Assistance [4]	**11.9**	**.10**	**30**	**2.36**	**16.0**	**.39**	**383**	**2.45**	**5.0**
Age of Householder									
Under 25 Years	2.6	.02	7	.52	2.8	.07	71	.44	12.4
25 to 34 Years	7.7	.08	22	1.73	11.0	.30	297	1.87	5.3
35 to 44 Years	8.1	.09	26	2.01	11.5	.33	319	2.04	5.1
45 to 59 Years	8.3	.09	25	1.89	11.5	.32	309	1.94	5.5
60 Years and Over	10.6	.06	18	1.43	14.6	.29	282	1.80	5.7
Education of Householder									
Less than 13 Years	20.1	.19	54	4.14	26.5	.66	647	4.07	4.5
13 to 16 Years	13.5	.12	36	2.75	18.0	.47	453	2.88	4.5
17 Years or More	3.8	.03	9	.69	7.0	.18	176	1.13	7.5

See footnotes at end of table.

Table 5.22. Total Electricity and Natural Gas Consumption and Expenditures for Water Heating in U.S. Households, 1993 (Continued)

Characteristics	Electricity				Natural Gas				RSE Row Factors
		Total Consumed				Total Consumed			
	Households (million)	(quadrillion Btu)	(billion kWh)	Total Expenditures (billion dollars)	Households (million)	(quadrillion Btu)	(billion cubic feet)	Total Expenditures (billion dollars)	
RSE Column Factors:	1.0	1.1 [1]	1.1 [1]	1.1 [1]	0.9	0.9 [1]	0.9 [1]	0.9 [1]	
Race of Householder									
White	32.4	0.29	86	6.55	41.1	1.02	989	6.19	4.1
Black	3.3	.03	9	.71	6.9	.21	203	1.32	9.1
Other [5]	1.6	.01	4	.33	3.5	.09	84	.57	10.2
Householder of Hispanic Descent									
Yes	2.0	.02	5	.42	5.0	.13	122	.82	11.1
No	35.3	.32	94	7.16	46.5	1.19	1,154	7.27	3.7
Household Size									
1 Person	9.3	.04	12	.98	12.2	.20	190	1.21	5.1
2 Persons	13.2	.11	32	2.41	16.2	.37	359	2.27	4.9
3 Persons	6.2	.07	20	1.51	9.0	.26	256	1.64	6.0
4 Persons	5.0	.07	19	1.47	8.5	.28	270	1.70	5.4
5 Persons	2.6	.04	11	.83	3.6	.12	121	.76	8.3
6 or More Persons	1.0	.02	5	.38	2.1	.08	81	.51	12.3

[1] This factor is underestimated because it contains no error for estimating this end use.
[2] Climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[3] Does not include all new construction for 1993.
[4] Below 150 percent of poverty line or 60 percent of median State income.
[5] Includes some householders who described themselves as Hispanic rather than White, Black, or other.
(*) = Value rounds to zero in the units displayed.
-- = Not applicable.

Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • See ''Glossary'' for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A, B, C, E, and F of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.23. Total Fuel Oil and LPG Consumption and Expenditures for Water Heating in U.S. Households, 1993

Characteristics	Fuel Oil				Liquefied Petroleum Gas				RSE Row Factors
		Total Consumed				Total Consumed			
	Households (million)	(quadrillion Btu)	(billion gallons)	Total Expenditures (billion dollars)	Households (million)	(quadrillion Btu)	(billion gallons)	Total Expenditures (billion dollars)	
RSE Column Factors:	0.8	0.8 [1]	0.8 [1]	0.9 [1]	1.2	1.2 [1]	1.2 [1]	1.2 [1]	
Total U.S. Households	**4.6**	**0.12**	**0.87**	**0.73**	**2.9**	**0.05**	**0.59**	**0.58**	**10.7**
Census Region and Division									
Northeast	4.4	.12	.84	.70	.4	.01	.08	.11	16.5
New England	1.5	.04	.29	.26	.2	(*)	.05	.06	19.7
Middle Atlantic	2.8	.08	.55	.45	.2	(*)	.04	.05	24.9
Midwest	Q	Q	Q	Q	1.0	.02	.24	.20	18.5
East North Central	Q	Q	Q	Q	.4	.01	.12	.10	20.2
West North Central	Q	Q	Q	Q	.6	.01	.12	.10	29.5
South	Q	Q	Q	Q	1.1	.02	.19	.19	15.4
South Atlantic	Q	Q	Q	Q	.4	.01	.08	.10	23.5
East South Central	NC	NC	NC	NC	.2	(*)	.04	.04	28.4
West South Central	NC	NC	NC	NC	.4	.01	.06	.05	25.1
West	Q	Q	Q	Q	.4	.01	.08	.08	31.1
Mountain	NC	NC	NC	NC	Q	Q	Q	Q	NF
Pacific	Q	Q	Q	Q	.2	(*)	.03	.04	35.4
Largest Populated States									
California	Q	Q	Q	Q	.2	(*)	.03	.04	36.7
Florida	Q	NC	NC	NC	Q	Q	Q	Q	NF
New York	1.8	.05	.36	.28	Q	Q	Q	Q	19.6
Texas	NC	NC	NC	NC	Q	(*)	.03	.03	28.8
Urban Status									
Urban	4.2	.11	.78	.65	1.1	.02	.23	.25	12.2
Central City	1.6	.04	.29	.21	.2	(*)	.03	.04	20.6
Suburban	2.5	.07	.50	.45	.9	.02	.20	.21	13.8
Rural	.5	.01	.09	.08	1.8	.03	.36	.33	18.6
Climate Zone [2]									
Under 2,000 CDD and Over 7,000 HDD	.6	.02	.11	.10	.6	.01	.11	.11	35.2
5,500 to 7,000 HDD	1.6	.04	.29	.26	.6	.02	.17	.15	20.2
4,000 to 5,499 HDD	2.5	.06	.47	.38	.5	Q	Q	.11	22.8
Under 4,000 HDD	Q	Q	Q	Q	.4	.01	.08	.08	28.1
2,000 CDD or More and Under 4,000 HDD	Q	NC	NC	NC	.8	.01	.13	.13	23.3
Total Number of Rooms (Excluding Bathrooms)									
1 or 2	.3	.01	.04	.04	Q	Q	Q	Q	23.9
3 to 5	2.1	.05	.38	.29	1.4	.02	.26	.26	14.7
6 to 8	1.9	.05	.36	.33	1.3	.03	.29	.29	12.4
9 or More	.4	.01	.09	.08	.1	(*)	.04	.04	29.7
Type of Housing Unit									
Single-Family	2.7	.07	.53	.49	2.4	.04	.48	.47	12.7
Detached	2.5	.07	.49	.45	2.3	.04	.47	.47	12.8
Attached	.2	.01	.04	.04	Q	Q	Q	Q	20.9
Mobile Home	Q	Q	Q	Q	.4	.01	.09	.08	23.4
Multifamily	1.9	.05	.34	.24	.1	(*)	.02	.03	25.0
2 to 4 Units	.6	.02	.11	.10	Q	Q	Q	Q	36.5
5 or More Units	1.3	.03	.23	.14	Q	Q	Q	Q	13.3
Heated Floorspace (square feet)									
Fewer than 1,000	1.3	.03	.21	.15	.8	.01	.15	.15	12.9
1,000 to 1,999	1.6	.04	.31	.27	1.3	.02	.26	.26	14.9
2,000 to 2,999	1.0	.03	.21	.19	.4	.01	.09	.09	16.9
3,000 or More	.7	.02	.15	.13	.3	.01	.08	.08	19.6

See footnotes at end of table.

Table 5.23. Total Fuel Oil and LPG Consumption and Expenditures for Water Heating in U.S. Households, 1993 (Continued)

Characteristics	Fuel Oil				Liquefied Petroleum Gas				RSE Row Factors
		Total Consumed				Total Consumed			
	Households (million)	(quadrillion Btu)	(billion gallons)	Total Expenditures (billion dollars)	Households (million)	(quadrillion Btu)	(billion gallons)	Total Expenditures (billion dollars)	
RSE Column Factors:	0.8	0.8 [1]	0.8 [1]	0.9 [1]	1.2	1.2 [1]	1.2 [1]	1.2 [1]	
Ownership of Unit									
Owned	2.9	0.08	0.56	0.51	2.4	0.04	0.48	0.47	11.8
Rented	1.8	.04	.31	.22	.5	.01	.11	.11	14.4
Public Housing	.2	(*)	.03	.02	Q	Q	Q	Q	40.7
Not Public Housing	1.6	.04	.28	.21	.5	.01	.11	.11	15.2
Rent Subsidy	.2	(*)	.03	.02	Q	Q	Q	Q	23.5
No Rent Subsidy	1.4	.03	.25	.18	.5	.01	.10	.11	16.5
Year of Construction									
1939 or Before	1.7	.04	.31	.25	.9	.02	.19	.18	16.8
1940 to 1949	.4	.01	.07	.06	.2	(*)	.02	.02	29.6
1950 to 1959	.9	.02	.17	.15	.3	(*)	.05	.05	20.4
1960 to 1969	.6	.01	.10	.08	.4	.01	.08	.09	22.1
1970 to 1979	.6	.02	.13	.11	.5	.01	.10	.09	18.5
1980 to 1984	.1	(*)	.02	.02	.2	(*)	.04	.03	37.2
1985 to 1987	.1	(*)	.03	.02	.2	(*)	.04	.04	28.6
1988 to 1990	.1	(*)	.02	.02	.1	(*)	.04	.04	32.7
1991 to 1993 [3]	.1	(*)	.02	.02	.2	(*)	.04	.04	37.9
Fuel Oil Paid by Household	**2.9**	**.08**	**.57**	**.52**	--	--	--	--	**16.0**
Liquefied Petroleum Gas Paid by Household	--	--	--	--	**2.8**	**.05**	**.57**	**.56**	**15.3**
1993 Family Income									
Less than $5,000	.2	(*)	.02	.02	.1	(*)	.02	.02	27.8
$5,000 to $9,999	.5	.01	.06	.05	.4	.01	.07	.07	29.0
$10,000 to $14,999	.5	.01	.07	.06	.3	.01	.06	.06	17.3
$15,000 to $19,999	.3	.01	.06	.05	.2	(*)	.05	.04	28.7
$20,000 to $24,999	.4	.01	.07	.05	.4	.01	.07	.07	23.4
$25,000 to $34,999	.7	.02	.13	.11	.5	.01	.11	.11	17.7
$35,000 to $49,999	1.0	.03	.19	.16	.4	.01	.12	.11	15.1
$50,000 to $74,999	.8	.02	.16	.14	.2	.01	.06	.05	18.3
$75,000 or More	.4	.01	.10	.10	.2	(*)	.04	.04	22.2
Below Poverty Line									
100 Percent	.7	.01	.11	.08	.5	.01	.09	.09	15.7
125 Percent	.8	.02	.14	.10	.8	.01	.14	.14	17.9
150 Percent	1.0	.03	.18	.14	1.0	.02	.18	.18	18.1
Eligible for Federal Assistance [4]	**1.4**	**.03**	**.23**	**.18**	**1.1**	**.02**	**.20**	**.20**	**16.3**
Age of Householder									
Under 25 Years	.2	.01	.04	.03	Q	Q	Q	Q	35.8
25 to 34 Years	.7	.02	.16	.13	.5	.01	.10	.10	22.2
35 to 44 Years	1.2	.03	.25	.21	.5	.01	.14	.14	16.0
45 to 59 Years	1.1	.03	.22	.19	.9	.02	.19	.19	14.7
60 Years and Over	1.4	.03	.21	.18	.9	.01	.14	.14	18.4
Education of Householder									
Less than 13 Years	2.5	.06	.46	.37	2.1	.04	.43	.42	12.6
13 to 16 Years	1.5	.04	.29	.25	.6	.01	.13	.13	13.0
17 Years or More	.6	.02	.12	.11	.1	(*)	.03	.03	24.3
Race of Householder									
White	3.9	.10	.73	.63	2.6	.05	.54	.53	12.0
Black	.4	.01	.08	.06	.2	(*)	.04	.04	20.6
Other [5]	.3	.01	.06	.04	Q	Q	Q	Q	19.4

See footnotes at end of table.

Table 5.23. Total Fuel Oil and LPG Consumption and Expenditures for Water Heating in U.S. Households, 1993 (Continued)

Characteristics	Fuel Oil				Liquefied Petroleum Gas				RSE Row Factors
		Total Consumed				Total Consumed			
	Households (million)	(quadrillion Btu)	(billion gallons)	Total Expenditures (billion dollars)	Households (million)	(quadrillion Btu)	(billion gallons)	Total Expenditures (billion dollars)	
RSE Column Factors:	0.8	0.8 [1]	0.8 [1]	0.9 [1]	1.2	1.2 [1]	1.2 [1]	1.2 [1]	
Householder of Hispanic Descent									
Yes	0.7	0.02	0.14	0.10	Q	Q	Q	Q	14.0
No	3.9	.10	.73	.63	2.7	0.05	0.57	0.56	11.0
Household Size									
1 Person	1.2	.02	.13	.10	.6	.01	.07	.07	14.1
2 Persons	1.3	.03	.22	.19	1.1	.02	.20	.20	15.2
3 Persons	.9	.03	.18	.16	.5	.01	.10	.11	19.0
4 Persons	.7	.02	.17	.15	.4	.01	.12	.11	17.9
5 Persons	.3	.01	.10	.08	.2	.01	.07	.06	24.1
6 or More Persons	.3	.01	.07	.06	.1	(*)	.03	.03	28.0

[1] This factor is underestimated because it contains no error for estimating this end use.
[2] Climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[3] Does not include all new construction for 1993.
[4] Below 150 percent of poverty line or 60 percent of median State income.
[5] Includes some householders who described themselves as Hispanic rather than White, Black, or other.
(*) = Value rounds to zero in the units displayed.
-- = Not applicable.
NC = No cases in sample.
NF = No applicable RSE row factor.
Q = Data withheld either because the Relative Standard Error (RSE) was greater than 50 percent or fewer than 10 households were sampled.
Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • See ''Glossary'' for definition of terms used in this report.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A, B, C, D, and G of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.24. Electricity and Natural Gas Consumption and Expenditures for Main Water Heating, per U.S. Household, 1993

Characteristics	Electricity					Natural Gas					RSE Row Factors
		Consumption					Consumption				
	Households (million)	(million Btu)	(kWh)	Expenditures (dollars)	Electricity Water-Heating Intensity (kWh per household member)	Households (million)	(million Btu)	(1000 cubic feet)	Expenditures (dollars)	Natural Gas Water-Heating Intensity (1000 cubic feet per household member)	
RSE Column Factors:	2.2	1.0 [1]	1.0 [1]	1.0 [1]	0.8 [1]	1.9	0.7 [1]	0.7 [1]	0.8 [1]	0.8 [1]	
Total U.S. Households	**37.0**	**9.1**	**2,671**	**204**	**1,055**	**51.4**	**25.5**	**24.8**	**157**	**9.3**	**1.6**
Census Region and Division											
Northeast	4.5	9.8	2,859	290	1,094	10.1	25.6	24.9	201	9.7	3.4
New England	1.4	9.9	2,907	323	1,092	1.9	25.4	24.7	217	9.9	4.6
Middle Atlantic	3.1	9.7	2,839	276	1,094	8.3	25.6	24.9	197	9.6	4.3
Midwest	6.9	10.2	2,988	224	1,202	15.4	28.0	27.2	151	10.5	3.0
East North Central	4.2	10.1	2,957	225	1,188	11.7	28.4	27.6	153	10.6	3.8
West North Central	2.7	10.4	3,035	222	1,224	3.7	26.7	26.0	142	10.2	3.9
South	19.2	8.6	2,532	190	997	12.7	25.7	25.0	159	9.3	2.9
South Atlantic	12.1	8.0	2,349	188	932	4.4	25.0	24.3	184	9.4	3.4
East South Central	3.9	9.9	2,909	178	1,120	1.8	26.8	26.1	152	10.0	7.5
West South Central	3.2	9.4	2,754	214	1,087	6.5	25.8	25.1	144	9.1	5.8
West	6.4	8.9	2,618	166	1,047	13.3	22.2	21.6	128	7.7	3.2
Mountain	1.9	9.3	2,732	184	1,025	3.2	25.4	24.7	128	9.7	6.1
Pacific	4.5	8.8	2,568	158	1,057	10.1	21.2	20.7	129	7.1	3.8
Largest Populated States											
California	1.5	6.9	2,008	186	748	9.4	20.5	20.0	126	6.9	5.6
Florida	4.9	6.6	1,927	160	750	.4	18.5	18.0	168	6.3	5.9
New York	1.1	9.6	2,822	328	1,046	3.8	26.2	25.4	220	9.8	7.6
Texas	2.2	9.0	2,646	207	1,047	3.9	24.6	23.9	137	8.6	7.6
Urban Status											
Urban	24.7	8.6	2,527	199	1,019	45.5	25.3	24.6	158	9.2	1.8
Central City	8.5	7.9	2,303	180	976	20.1	25.3	24.6	162	9.4	3.3
Suburban	16.2	9.0	2,644	208	1,040	25.4	25.3	24.7	155	9.1	2.4
Rural	12.3	10.1	2,960	216	1,123	6.0	26.5	25.8	147	10.0	3.8
Climate Zone [2]											
Under 2,000 CDD and Over 7,000 HDD	3.7	11.0	3,219	242	1,207	3.8	26.9	26.1	143	10.3	4.8
5,500 to 7,000 HDD	7.4	10.4	3,041	235	1,210	16.8	27.4	26.6	162	10.5	3.5
4,000 to 5,499 HDD	8.8	9.6	2,805	200	1,130	10.5	26.6	25.9	185	9.7	3.7
Under 4,000 HDD	6.3	8.4	2,449	190	1,001	11.0	22.7	22.1	141	7.7	4.6
2,000 CDD or More and Under 4,000 HDD	10.8	7.7	2,247	182	869	9.4	23.4	22.8	139	8.5	3.9
Total Number of Rooms (Excluding Bathrooms)											
1 or 2	1.0	5.6	1,641	136	1,166	1.8	16.3	15.9	113	11.2	7.2
3 to 5	20.4	8.2	2,393	185	1,055	23.2	23.3	22.7	145	9.9	2.4
6 to 8	14.0	10.5	3,088	232	1,056	22.7	27.3	26.6	166	8.8	2.1
9 or More	1.6	10.9	3,194	248	1,022	3.7	32.0	31.1	196	8.9	5.8
Type of Housing Unit											
Single-Family	24.1	9.9	2,892	217	1,071	37.0	26.1	25.4	158	8.9	1.8
Detached	21.5	10.1	2,951	220	1,075	32.6	26.3	25.6	157	8.9	1.9
Attached	2.6	8.2	2,415	192	1,036	4.4	24.9	24.2	163	9.0	6.0
Mobile Home	4.0	9.5	2,787	218	1,031	1.1	23.6	22.9	130	9.3	6.8
Multifamily	8.8	6.9	2,015	163	1,012	13.3	23.7	23.0	156	10.6	3.8
2 to 4 Units	2.5	7.1	2,087	171	933	4.9	27.3	26.5	182	10.6	5.9
5 or More Units	6.3	6.8	1,986	161	1,049	8.4	21.6	21.0	141	10.5	4.6

See footnotes at end of table.

Table 5.24. Electricity and Natural Gas Consumption and Expenditures for Main Water Heating, per U.S. Household, 1993 (Continued)

Characteristics	Electricity					Natural Gas					RSE Row Factors
		Consumption					Consumption				
	Households (million)	(million Btu)	(kWh)	Expenditures (dollars)	Electricity Water-Heating Intensity (kWh per household member)	Households (million)	(million Btu)	(1000 cubic feet)	Expenditures (dollars)	Natural Gas Water-Heating Intensity (1000 cubic feet per household member)	
RSE Column Factors:	2.2	1.0 [1]	1.0 [1]	1.0 [1]	0.8 [1]	1.9	0.7 [1]	0.7 [1]	0.8 [1]	0.8 [1]	
Heated Floorspace (square feet)											
Fewer than 1,000	12.5	7.6	2,216	174	1,042	14.3	21.7	21.2	139	10.0	2.9
1,000 to 1,999	15.3	9.4	2,749	208	1,032	21.8	25.3	24.6	155	8.9	2.2
2,000 to 2,999	6.3	10.5	3,077	233	1,070	10.0	28.4	27.6	173	9.2	3.0
3,000 or More	2.9	11.4	3,330	256	1,185	5.3	30.4	29.6	181	9.4	3.8
Ownership of Unit											
Owned	24.5	9.6	2,800	212	1,057	33.0	26.1	25.4	159	9.2	1.9
Rented	12.5	8.3	2,418	189	1,051	18.4	24.3	23.6	153	9.5	2.9
Public Housing	1.4	7.2	2,123	168	980	1.8	23.0	22.4	143	10.2	11.6
Not Public Housing	11.1	8.4	2,454	191	1,059	16.6	24.4	23.8	155	9.4	3.1
Rent Subsidy	.6	6.9	2,013	157	957	1.2	24.0	23.4	157	9.6	10.6
No Rent Subsidy	10.6	8.5	2,478	193	1,064	15.4	24.5	23.8	154	9.4	3.2
Year of Construction											
1939 or Before	5.2	9.4	2,755	217	1,105	12.4	25.4	24.7	162	9.7	4.0
1940 to 1949	2.0	9.8	2,882	200	1,134	4.2	24.2	23.6	154	9.3	4.9
1950 to 1959	3.6	9.1	2,660	207	1,004	8.3	25.3	24.7	159	8.6	4.1
1960 to 1969	4.8	8.3	2,445	191	1,055	9.1	24.4	23.8	146	9.7	4.0
1970 to 1979	9.3	9.2	2,695	201	1,092	7.6	25.8	25.1	150	9.2	3.5
1980 to 1984	4.5	9.0	2,652	206	1,040	3.7	25.8	25.1	157	8.7	4.4
1985 to 1987	2.9	8.9	2,595	206	965	2.3	27.1	26.4	167	9.1	5.6
1988 to 1990	2.7	10.0	2,936	223	1,036	1.8	28.3	27.6	171	9.1	5.4
1991 to 1993 [3]	2.1	8.5	2,504	187	985	2.1	26.9	26.2	168	9.6	7.2
Electric Water-Heating Paid by Household											
Yes	35.0	9.3	2,718	207	1,060	--	--	--	--	--	1.6
No	2.0	6.3	1,860	153	953	--	--	--	--	--	7.3
Natural Gas Water-Heating Paid by Household											
Yes	--	--	--	--	--	41.9	26.0	25.3	159	9.1	1.8
No	--	--	--	--	--	9.5	23.2	22.6	148	10.6	3.8
1993 Family Income											
Less than $5,000	1.6	8.0	2,339	182	1,071	2.1	24.3	23.6	156	9.4	6.7
$5,000 to $9,999	4.0	6.9	2,030	160	1,113	5.5	21.5	20.9	133	10.5	4.9
$10,000 to $14,999	4.3	8.0	2,355	184	1,000	6.0	22.9	22.2	142	9.3	4.6
$15,000 to $19,999	4.1	8.6	2,523	191	998	4.9	23.3	22.7	141	9.8	4.1
$20,000 to $24,999	3.7	8.7	2,537	190	1,078	4.3	23.1	22.5	140	9.7	3.8
$25,000 to $34,999	6.1	9.3	2,722	205	1,060	6.7	25.2	24.5	152	9.2	3.3
$35,000 to $49,999	6.6	10.0	2,932	227	1,047	9.3	27.1	26.3	167	9.0	2.8
$50,000 to $74,999	4.4	10.9	3,202	238	1,089	7.2	28.5	27.7	175	8.6	3.1
$75,000 or More	2.3	10.8	3,172	247	1,074	5.3	30.2	29.4	191	9.4	4.7
Below Poverty Line											
100 Percent	5.4	9.0	2,639	205	977	7.6	25.8	25.1	161	8.5	4.1
125 Percent	7.5	9.1	2,654	206	983	10.0	25.6	25.0	160	8.6	3.4
150 Percent	9.8	9.1	2,680	208	989	12.6	25.5	24.8	158	8.8	3.2
Eligible for Federal Assistance [4]	**11.8**	**8.7**	**2,561**	**199**	**978**	**16.0**	**24.6**	**23.9**	**153**	**9.1**	**2.7**

See footnotes at end of table.

Table 5.24. Electricity and Natural Gas Consumption and Expenditures for Main Water Heating, per U.S. Household, 1993 (Continued)

Characteristics	Electricity					Natural Gas					RSE Row Factors
		Consumption					Consumption				
	Households (million)	(million Btu)	(kWh)	Expenditures (dollars)	Electricity Water-Heating Intensity (kWh per household member)	Households (million)	(million Btu)	(1000 cubic feet)	Expenditures (dollars)	Natural Gas Water-Heating Intensity (1000 cubic feet per household member)	
RSE Column Factors:	2.2	1.0 [1]	1.0 [1]	1.0 [1]	0.8 [1]	1.9	0.7 [1]	0.7 [1]	0.8 [1]	0.8 [1]	
Age of Householder											
Under 25 Years	2.6	9.1	2,662	202	1,137	2.8	26.2	25.5	158	9.4	5.3
25 to 34 Years	7.7	10.0	2,916	225	1,000	11.0	27.7	26.9	169	8.8	2.8
35 to 44 Years	8.1	11.1	3,241	249	1,003	11.5	28.4	27.6	177	8.2	2.4
45 to 59 Years	8.2	10.5	3,065	230	1,190	11.5	27.5	26.7	168	10.1	2.7
60 Years and Over	10.5	6.0	1,750	136	1,015	14.6	19.8	19.2	123	10.4	2.7
Education of Householder											
Less than 13 Years	19.9	9.3	2,721	208	1,043	26.5	25.0	24.4	153	9.1	2.0
13 to 16 Years	13.3	9.2	2,709	206	1,082	18.0	25.8	25.1	159	9.5	2.3
17 Years or More	3.8	7.8	2,275	184	1,029	7.0	26.0	25.3	163	9.4	3.5
Race of Householder											
White	32.1	9.1	2,679	203	1,073	41.0	24.7	24.0	151	9.3	1.7
Black	3.3	9.1	2,666	215	1,028	6.9	30.4	29.6	192	10.6	4.4
Other [5]	1.6	8.6	2,529	206	818	3.5	24.4	23.7	159	6.8	5.7
Householder of Hispanic Descent											
Yes	2.0	8.9	2,605	213	822	5.0	25.0	24.3	162	7.4	5.4
No	35.0	9.1	2,675	204	1,072	46.4	25.5	24.8	156	9.6	1.6
Household Size											
1 Person	9.2	4.6	1,335	106	1,335	12.2	15.9	15.5	99	15.5	2.6
2 Persons	13.0	8.3	2,439	184	1,219	16.1	22.8	22.2	140	11.1	2.4
3 Persons	6.1	10.9	3,208	246	1,069	9.0	29.3	28.5	183	9.5	2.5
4 Persons	5.0	13.2	3,865	296	966	8.5	32.7	31.8	200	8.0	2.5
5 Persons	2.6	14.2	4,167	315	833	3.6	34.6	33.6	211	6.7	3.5
6 or More Persons	1.0	16.3	4,776	366	711	2.1	40.2	39.1	246	5.7	5.2
Average Electricity Expenditures (cents per kWh)											
Less than 6	6.7	11.3	3,304	169	1,294	--	--	--	--	--	2.3
6 to Less than 9	21.1	9.3	2,730	207	1,052	--	--	--	--	--	2.1
9 or More	9.2	7.1	2,075	223	877	--	--	--	--	--	3.3
Average Natural Gas Expenditures (dollars per 1000 cf)											
Less than 4.50	--	--	--	--	--	2.3	32.1	31.2	127	11.5	3.0
4.50 to Less than 6	--	--	--	--	--	20.7	26.7	26.0	138	9.9	2.4
6 or More	--	--	--	--	--	28.4	24.0	23.4	173	8.7	2.4
Water Heater Used											
For One Housing Unit	35.7	9.2	2,703	206	1,060	44.0	25.9	25.1	158	9.1	1.7
For Two or More Units	1.3	6.2	1,824	153	904	7.5	23.1	22.5	150	11.0	6.4
Age of Water Heater (for one housing unit)											
Less than 5 Years	10.2	9.5	2,796	213	1,071	13.4	26.3	25.6	160	9.1	2.5
5 to 9 Years	8.6	9.4	2,758	212	1,029	11.6	26.5	25.8	164	8.9	3.0
10 to 19 Years	8.6	9.3	2,712	203	1,062	9.6	26.1	25.4	156	9.1	3.0
20 Years or More	3.0	8.2	2,406	189	1,086	3.6	22.0	21.4	137	9.6	5.1
Don't Know/No Separate Unit	5.1	8.8	2,586	199	1,076	5.9	25.6	24.9	156	9.0	4.4

See footnotes at end of table.

Table 5.24. Electricity and Natural Gas Consumption and Expenditures for Main Water Heating, per U.S. Household, 1993 (Continued)

Characteristics	Electricity					Natural Gas					RSE Row Factors
		Consumption					Consumption				
	Households (million)	(million Btu)	(kWh)	Expenditures (dollars)	Electricity Water-Heating Intensity (kWh per household member)	Households (million)	(million Btu)	(1000 cubic feet)	Expenditures (dollars)	Natural Gas Water-Heating Intensity (1000 cubic feet per household member)	
RSE Column Factors:	2.2	1.0 [1]	1.0 [1]	1.0 [1]	0.8 [1]	1.9	0.7 [1]	0.7 [1]	0.8 [1]	0.8 [1]	
Size of Water Heater (for one housing unit)											
30 gallons or less	8.3	7.6	2,218	178	989	7.8	21.8	21.2	133	8.6	3.1
31 to 49 gallons	16.7	9.0	2,630	201	1,021	25.1	26.2	25.5	158	9.2	2.3
50 gallons or more	8.6	11.5	3,374	247	1,195	8.3	29.0	28.2	180	8.9	2.8
Don't Know/No Separate Unit	2.0	8.4	2,447	194	998	2.9	24.9	24.2	156	9.4	5.7
Clothes Washer											
Yes	29.0	9.8	2,868	216	1,064	39.3	26.3	25.6	160	9.1	1.7
No	8.0	6.7	1,957	162	1,013	12.1	22.7	22.1	147	10.3	3.4
Dishwasher											
Yes	17.3	9.6	2,804	211	1,088	23.5	27.2	26.4	165	9.2	2.3
No	19.7	8.7	2,554	199	1,026	28.0	24.0	23.4	150	9.4	2.2
Children Present in Household											
No	23.6	7.2	2,117	163	1,210	31.1	21.3	20.7	131	11.6	1.8
Yes	13.4	12.4	3,648	277	933	20.3	31.9	31.0	197	7.7	1.9
(more than one may apply)											
Under 13 Years	10.4	12.3	3,618	276	891	16.2	32.0	31.2	197	7.5	2.1
13 to 18 Years	5.6	13.7	4,005	302	980	8.7	34.2	33.3	210	7.8	2.6

[1] This factor is underestimated because it contains no error for estimating this end use.
[2] Climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[3] Does not include all new construction for 1993.
[4] Below 150 percent of poverty line or 60 percent of median State income.
[5] Includes some householders who described themselves as Hispanic rather than White, Black, or other.
-- = Not applicable.

Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • See ''Glossary'' for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A, B, C, E, and F of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.25. Fuel Oil and LPG Consumption and Expenditures for Main Water Heating, per U.S. Household, 1993

Characteristics	Fuel Oil					Liquefied Petroleum Gas					RSE Row Factors
		Consumption					Consumption				
	Households (million)	(million Btu)	(gallons)	Expenditures (dollars)	Fuel Oil Water-Heating Intensity (gallons per household member)	Households (million)	(million Btu)	(gallons)	Expenditures (dollars)	LPG Water-Heating Intensity (gallons per household member)	
RSE Column Factors:	1.6	0.6 [1]	0.6 [1]	0.7 [1]	0.6 [1]	2.4	1.1 [1]	1.1 [1]	1.2 [1]	1.1 [1]	
Total U.S. Households	**4.6**	**26.2**	**189**	**158**	**70**	**2.9**	**18.7**	**205**	**201**	**78**	**4.6**
Census Region and Division											
Northeast	4.3	26.7	193	161	71	.4	19.1	209	267	87	6.1
New England	1.5	26.2	189	168	74	.2	18.3	200	247	92	8.5
Middle Atlantic	2.8	27.0	195	158	69	.2	20.1	221	295	81	9.6
Midwest	Q	Q	Q	Q	Q	1.0	22.1	242	199	86	8.0
East North Central	Q	Q	Q	Q	Q	.4	25.6	281	237	94	14.1
West North Central	Q	Q	Q	Q	Q	.6	19.3	211	170	79	6.0
South	Q	Q	Q	Q	Q	1.1	15.8	173	175	65	8.4
South Atlantic	Q	Q	Q	Q	Q	.4	17.0	186	223	64	10.0
East South Central	NC	NC	NC	NC	NC	.2	17.3	189	162	69	6.6
West South Central	NC	NC	NC	NC	NC	.4	13.6	149	131	63	27.2
West	Q	Q	Q	Q	Q	.4	17.7	194	210	81	11.3
Mountain	NC	NC	NC	NC	NC	Q	21.2	232	202	88	11.5
Pacific	Q	Q	Q	Q	Q	.2	14.0	153	218	71	17.6
Largest Populated States											
California	Q	Q	Q	Q	Q	.2	15.1	165	236	73	17.1
Florida	Q	NC	NC	NC	NC	Q	Q	Q	Q	Q	NF
New York	1.8	27.7	200	155	71	Q	20.3	222	282	76	11.1
Texas	NC	NC	NC	NC	NC	Q	Q	Q	Q	Q	NF
Urban Status											
Urban	4.1	26.2	189	157	70	1.1	20.0	219	233	78	6.0
Central City	1.6	24.6	178	128	69	.2	16.2	177	209	85	9.0
Suburban	2.5	27.2	196	176	71	.9	20.8	228	238	77	7.3
Rural	.5	25.9	187	168	67	1.8	17.9	196	182	77	8.1
Climate Zone [2]											
Under 2,000 CDD and Over 7,000 HDD	.5	27.8	201	175	73	.6	18.4	202	196	76	11.6
5,500 to 7,000 HDD	1.5	25.6	184	164	74	.6	24.5	268	241	98	10.8
4,000 to 5,499 HDD	2.5	26.4	191	153	67	Q	20.2	222	227	83	7.9
Under 4,000 HDD	Q	Q	Q	Q	Q	.4	16.6	181	185	75	12.5
2,000 CDD or More and Under 4,000 HDD	Q	NC	NC	NC	NC	.8	14.6	160	167	60	9.4
Total Number of Rooms (Excluding Bathrooms)											
1 or 2	.3	21.5	155	122	104	Q	Q	Q	Q	Q	15.3
3 to 5	2.0	25.5	184	140	72	1.4	16.8	184	179	82	5.8
6 to 8	1.8	26.6	192	175	68	1.3	20.3	223	218	74	6.4
9 or More	.4	31.0	223	204	59	.1	22.7	248	276	74	14.5
Type of Housing Unit											
Single-Family	2.7	27.4	197	181	67	2.4	18.3	200	198	75	5.5
Detached	2.4	27.4	197	182	70	2.3	18.4	201	199	76	5.9
Attached	.2	27.3	197	174	48	Q	Q	Q	Q	Q	29.5
Mobile Home	Q	Q	Q	Q	Q	.4	20.9	229	203	82	8.1
Multifamily	1.9	24.6	177	127	74	.1	19.6	215	262	118	8.8
2 to 4 Units	.6	26.6	192	175	73	Q	Q	Q	Q	Q	15.1
5 or More Units	1.3	23.7	171	107	74	Q	Q	Q	Q	Q	5.8
Heated Floorspace (square feet)											
Fewer than 1,000	1.3	22.2	160	111	74	.8	16.7	183	182	73	6.3
1,000 to 1,999	1.5	27.1	195	168	69	1.3	18.6	204	201	84	6.9
2,000 to 2,999	1.0	28.4	205	187	73	.4	19.2	211	203	68	7.3
3,000 or More	.7	28.4	205	187	61	.3	23.2	254	248	81	9.5

See footnotes at end of table.

Table 5.25. Fuel Oil and LPG Consumption and Expenditures for Main Water Heating, per U.S. Household, 1993 (Continued)

Characteristics	Fuel Oil					Liquefied Petroleum Gas					RSE Row Factors
		Consumption					Consumption				
	Households (million)	(million Btu)	(gallons)	Expenditures (dollars)	Fuel Oil Water-Heating Intensity (gallons per household member)	Households (million)	(million Btu)	(gallons)	Expenditures (dollars)	LPG Water-Heating Intensity (gallons per household member)	
RSE Column Factors:	1.6	0.6 [1]	0.6 [1]	0.7 [1]	0.6 [1]	2.4	1.1 [1]	1.1 [1]	1.2 [1]	1.1 [1]	
Ownership of Unit											
Owned	2.8	27.5	198	179	69	2.4	18.5	202	197	79	5.1
Rented	1.8	24.1	174	126	70	.5	19.8	217	219	72	7.3
Public Housing	.2	22.1	160	96	82	Q	Q	Q	Q	Q	21.0
Not Public Housing	1.6	24.3	176	129	69	.5	19.9	218	221	72	7.6
Rent Subsidy	.2	22.3	161	119	75	Q	Q	Q	Q	Q	38.3
No Rent Subsidy	1.4	24.6	178	131	69	.5	19.6	215	220	72	10.1
Year of Construction											
1939 or Before	1.7	24.7	178	142	68	.9	19.4	213	205	92	9.3
1940 to 1949	.4	23.1	166	139	68	.2	13.0	143	143	83	13.5
1950 to 1959	.9	27.7	200	173	73	.3	14.7	161	160	50	9.8
1960 to 1969	.6	24.4	176	147	66	.4	19.2	210	235	82	9.9
1970 to 1979	.6	27.1	195	168	75	.5	18.7	205	190	73	10.3
1993 to 1984	.1	34.5	249	214	59	.2	16.3	178	169	67	18.5
1985 to 1987	.1	39.9	287	255	74	.2	21.3	233	228	79	13.8
1988 to 1990	.1	26.9	194	175	68	.1	24.0	263	271	81	15.4
1991 to 1993 [3]	.1	35.6	256	235	65	.2	21.9	240	217	79	14.3
Fuel Oil Paid by Household											
Yes	2.9	27.0	195	179	67	--	--	--	--	--	7.0
No	1.6	24.6	177	121	76	--	--	--	--	--	4.9
Liquefied Petroleum Gas Paid by Household											
Yes	--	--	--	--	--	2.7	18.7	204	201	77	9.4
No	--	--	--	--	--	Q	Q	Q	Q	Q	NF
1993 Family Income											
Less than $5,000	.2	19.8	143	107	77	.1	12.8	140	151	98	18.2
$5,000 to $9,999	.5	19.0	137	104	70	.4	14.1	155	157	86	16.9
$10,000 to $14,999	.5	21.5	155	119	78	.3	16.5	180	179	74	10.0
$15,000 to $19,999	.3	26.8	194	158	75	.2	17.7	194	177	65	12.9
$20,000 to $24,999	.4	25.0	180	134	70	.4	18.5	203	202	76	11.0
$25,000 to $34,999	.7	27.7	200	168	71	.5	18.3	200	207	67	9.5
$35,000 to $49,999	1.0	27.1	195	169	63	.4	24.7	270	246	98	12.2
$50,000 to $74,999	.7	28.6	206	184	67	.2	23.9	262	252	75	9.7
$75,000 or More	.4	33.1	238	216	78	.2	21.6	237	242	75	11.1
Below Poverty Line											
100 Percent	.6	22.8	164	121	63	.5	15.3	167	174	75	12.4
125 Percent	.8	23.8	172	124	65	.8	16.1	176	171	67	10.9
150 Percent	1.0	24.6	178	131	64	1.0	16.4	180	176	67	9.4
Eligible for Federal Assistance [4]	**1.3**	**23.7**	**171**	**130**	**69**	**1.1**	**16.0**	**175**	**174**	**66**	**8.2**
Age of Householder											
Under 25 Years	.2	20.9	151	117	53	Q	Q	Q	Q	Q	29.0
25 to 34 Years	.7	31.6	228	181	66	.5	20.6	226	221	65	8.3
35 to 44 Years	1.2	28.5	206	177	66	.5	24.7	270	275	71	7.8
45 to 59 Years	1.1	27.4	197	170	73	.9	19.8	217	210	93	8.8
60 Years and Over	1.3	21.3	153	129	80	.9	13.7	150	148	80	8.2
Education of Householder											
Less than 13 Years	2.5	25.6	184	148	68	2.1	18.5	203	198	77	5.5
13 to 16 Years	1.5	26.6	192	168	68	.6	19.0	208	208	76	7.5
17 Years or More	.6	27.5	198	177	84	.1	20.7	227	223	97	12.0

See footnotes at end of table.

Table 5.25. Fuel Oil and LPG Consumption and Expenditures for Main Water Heating, per U.S. Household, 1993 (Continued)

Characteristics	Fuel Oil					Liquefied Petroleum Gas					RSE Row Factors
		Consumption					Consumption				
	Households (million)	(million Btu)	(gallons)	Expenditures (dollars)	Fuel Oil Water-Heating Intensity (gallons per household member)	Households (million)	(million Btu)	(gallons)	Expenditures (dollars)	LPG Water-Heating Intensity (gallons per household member)	
RSE Column Factors:	1.6	0.6 [1]	0.6 [1]	0.7 [1]	0.6 [1]	2.4	1.1 [1]	1.1 [1]	1.2 [1]	1.1 [1]	
Race of Householder											
White	3.9	25.8	186	160	70	2.6	19.0	208	203	79	5.0
Black	.4	27.6	199	146	76	.2	14.5	159	175	58	11.6
Other [5]	.3	28.9	208	148	58	Q	Q	Q	Q	Q	11.3
Householder of Hispanic Descent											
Yes	.7	28.1	203	147	66	Q	15.6	171	184	66	10.6
No	3.9	25.8	186	161	70	2.7	18.9	206	202	78	5.0
Household Size											
1 Person	1.1	15.6	112	91	112	.6	11.8	130	124	130	7.4
2 Persons	1.3	23.5	170	140	85	1.1	16.5	180	178	90	6.8
3 Persons	.9	28.6	206	180	69	.5	19.8	216	235	72	8.1
4 Persons	.7	33.6	242	207	61	.4	25.9	283	267	71	11.4
5 Persons	.3	42.2	304	249	61	.2	29.7	326	307	65	8.3
6 or More Persons	.3	38.5	277	238	42	.1	24.9	273	236	40	20.4
Average Fuel Oil Expenditures (dollars per gallon)											
Less than 0.95	3.8	25.8	186	148	70	--	--	--	--	--	4.9
0.95 to Less than 1.10	.6	26.5	191	193	69	--	--	--	--	--	8.6
1.10 or More	.2	34.8	251	289	75	--	--	--	--	--	12.5
Average LPG Expenditures (dollars per gallon)											
Less than 0.75	--	--	--	--	--	.4	17.9	195	126	79	7.6
0.75 to Less than 1.00	--	--	--	--	--	1.5	20.1	221	191	77	6.6
1.00 or More	--	--	--	--	--	1.0	16.7	183	247	78	6.6
Water Heater Used											
For One Housing Unit	2.8	26.9	194	178	68	2.7	18.7	204	199	76	5.2
For Two or More Units	1.8	25.1	181	128	73	Q	Q	Q	Q	Q	5.9
Age of Water Heater (for one housing unit)											
Less than 5 Years	.5	27.1	196	180	59	1.0	18.2	200	197	70	10.3
5 to 9 Years	.5	27.7	200	187	67	.7	17.6	193	191	72	9.8
10 to 19 Years	.5	27.0	195	178	67	.6	21.1	231	220	92	11.6
20 Years or More	.6	24.6	178	162	75	.3	18.3	201	186	89	11.5
Don't Know/No Separate Unit	.7	28.2	203	184	71	.2	17.3	190	197	67	10.5
Size of Water Heater (for one housing unit)											
30 gallons of less	.7	25.4	183	165	75	.8	16.5	181	183	78	8.0
31 to 49 gallons	.8	26.8	193	177	61	1.3	18.9	207	195	72	7.7
50 gallons or more	.4	29.1	210	193	65	.5	18.5	202	200	75	9.7
Don't Know/No Separate Unit	.9	27.2	196	182	71	.2	Q	Q	301	117	15.9
Clothes Washer											
Yes	3.2	27.5	199	174	68	2.5	19.4	212	207	77	4.7
No	1.3	22.9	165	119	74	.4	14.6	160	165	86	9.2
Dishwasher											
Yes	1.8	29.3	211	190	72	.9	23.7	259	246	83	6.4
No	2.8	24.2	174	138	68	2.0	16.4	180	181	74	5.5

See footnotes at end of table.

Table 5.25. Fuel Oil and LPG Consumption and Expenditures for Main Water Heating, per U.S. Household, 1993 (Continued)

Characteristics	Fuel Oil					Liquefied Petroleum Gas					RSE Row Factors
		Consumption					Consumption				
	Households (million)	(million Btu)	(gallons)	Expenditures (dollars)	Fuel Oil Water-Heating Intensity (gallons per household member)	Households (million)	(million Btu)	(gallons)	Expenditures (dollars)	LPG Water-Heating Intensity (gallons per household member)	
RSE Column Factors:	1.6	0.6 [1]	0.6 [1]	0.7 [1]	0.6 [1]	2.4	1.1 [1]	1.1 [1]	1.2 [1]	1.1 [1]	
Children Present in Household											
No	2.9	21.5	155	129	83	1.8	15.0	164	163	91	5.7
Yes	1.7	34.1	246	208	59	1.0	25.2	276	268	67	5.6
(more than one may apply)											
Under 13 Years	1.3	33.7	243	201	57	.8	23.7	259	249	60	5.8
13 to 18 Years	.7	35.9	259	222	60	.5	28.9	316	304	77	10.1

[1] This factor is underestimated because it contains no error for estimating this end use.
[2] Climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[3] Does not include all new construction for 1993.
[4] Below 150 percent of poverty line or 60 percent of median State income.
[5] Includes some householders who described themselves as Hispanic rather than White, Black, or other.
-- = Not applicable.
NC = No cases in sample.
NF = No applicable RSE row factor.
Q = Data withheld either because the Relative Standard Error (RSE) was greater than 50 percent or fewer than 10 households were sampled.
Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • See ''Glossary'' for definition of terms used in this report.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A, B, C, D, and G of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.26. Total Consumption and Expenditures for Appliances in U.S. Households, 1993

Characteristics	Electricity				Natural Gas				Liquefied Petroleum Gas				RSE Row Factors
		Consumed		Expenditures (billion dollars)		Consumed		Expenditures (billion dollars)		Consumed		Expenditures (billion dollars)	
	Households (million)	(quadrillion Btu)	(billion kWh)		Households (million)	(quadrillion Btu)	(billion cubic feet)		Households (million)	(quadrillion Btu)	(billion gallons)		
RSE Column Factors:	0.4	0.5 [1]	0.5 [1]	0.5 [1]	0.8	0.9 [1]	0.9 [1]	0.9 [1]	2.2	2.4 [1]	2.4 [1]	2.4 [1]	
Total U.S. Households	**96.6**	**1.63**	**476**	**41.55**	**37.8**	**0.29**	**282**	**1.98**	**4.9**	**0.03**	**0.32**	**0.42**	**3.9**
Census Region and Division													
Northeast	19.5	.27	79	9.28	10.1	.08	74	.73	1.0	.01	.06	.10	8.3
New England	5.1	.07	21	2.42	1.7	.01	14	.14	.4	(*)	.02	.04	14.1
Middle Atlantic	14.4	.20	58	6.86	8.4	.06	60	.59	.6	(*)	.03	.06	10.4
Midwest	23.3	.41	121	9.98	10.4	.08	76	.42	1.1	.01	.08	.07	8.7
East North Central	16.4	.29	84	7.18	7.9	.06	59	.33	.5	(*)	.03	.03	10.7
West North Central	6.9	.13	37	2.80	2.4	.02	17	.09	.6	(*)	.05	.04	13.4
South	33.4	.64	186	14.51	8.7	.08	75	.47	2.4	.01	.16	.21	7.0
South Atlantic	17.3	.31	91	7.39	2.9	.02	22	.17	1.4	.01	.10	.16	11.3
East South Central	6.0	.12	36	2.29	1.1	.01	10	.05	.5	(*)	.03	.03	13.6
West South Central	10.1	.20	59	4.83	4.7	.04	43	.25	.5	(*)	.03	.02	12.8
West	20.4	.31	90	7.78	8.6	.06	57	.36	.4	(*)	.03	.04	8.3
Mountain	5.4	.09	27	1.97	1.6	.01	10	.06	.2	(*)	.01	.02	15.4
Pacific	15.0	.21	63	5.81	7.0	.05	47	.30	.2	(*)	.01	.02	9.4
Largest Populated States													
California	11.1	.14	41	4.61	6.6	.04	43	.28	.2	(*)	.01	.02	10.0
Florida	5.6	.10	30	2.48	.3	(*)	2	.02	.7	.01	.06	.09	14.9
New York	6.8	.08	24	3.36	4.5	.03	31	.37	.3	(*)	.02	.03	14.9
Texas	6.4	.13	38	3.03	2.8	.03	24	.15	Q	Q	Q	Q	10.6
Urban Status													
Urban	75.8	1.22	359	32.51	33.9	.26	254	1.82	2.2	.01	.14	.20	4.7
Central City	30.6	.42	123	11.27	16.2	.12	115	.88	.5	(*)	.03	.04	6.2
Suburban	45.2	.80	235	21.24	17.8	.14	139	.94	1.7	.01	.11	.16	5.7
Rural	20.8	.40	118	9.04	3.8	.03	28	.17	2.8	.02	.18	.21	9.9
Climate Zone [2]													
Under 2,000 CDD and Over 7,000 HDD	8.7	.16	47	3.66	2.1	.01	14	.08	.8	(*)	.05	.06	23.0
5,500 to 7,000 HDD	26.5	.44	129	11.38	12.2	.09	91	.59	.9	.01	.06	.07	14.0
4,000 to 5,499 HDD	22.4	.36	107	9.53	9.2	.07	67	.62	.9	.01	.06	.08	15.0
Under 4,000 HDD	17.8	.27	79	7.33	7.3	.05	50	.33	.7	(*)	.04	.06	16.9
2,000 CDD or More and Under 4,000 HDD	21.2	.39	115	9.64	7.0	.06	59	.37	1.7	.01	.11	.15	12.1
Total Number of Rooms (Excluding Bathrooms)													
1 or 2	3.2	.02	5	.51	1.3	.01	6	.06	Q	Q	Q	Q	20.1
3 to 5	47.3	.60	176	15.58	17.8	.12	115	.85	3.0	.02	.18	.24	5.4
6 to 8	40.2	.85	249	21.38	16.1	.14	132	.88	1.7	.01	.12	.14	6.0
9 or More	5.8	.16	46	4.08	2.6	.03	30	.19	.2	(*)	.02	.03	17.0
Type of Housing Unit													
Single-Family	66.7	1.33	389	33.34	26.6	.21	208	1.37	3.2	.02	.21	.27	4.9
Detached	59.4	1.22	356	30.34	23.1	.19	183	1.19	3.2	.02	.21	.27	5.3
Attached	7.3	.11	33	3.01	3.5	.03	25	.19	Q	Q	Q	Q	15.4
Mobile Home	5.6	.09	26	2.11	1.5	.01	9	.06	1.5	.01	.10	.13	14.2
Multifamily	24.2	.21	61	6.09	9.7	.07	64	.56	.2	(*)	.01	.02	9.8
2 to 4 Units	8.0	.08	23	2.34	4.2	.03	32	.26	.1	(*)	.01	.02	13.3
5 or More Units	16.2	.13	38	3.75	5.5	.03	32	.30	Q	Q	Q	Q	10.9
Heated Floorspace (square feet)													
Fewer than 1,000	29.3	.29	86	7.70	11.2	.07	70	.55	2.0	.01	.12	.16	6.5
1,000 to 1,999	40.2	.70	205	17.84	16.1	.12	119	.82	1.8	.01	.12	.14	5.8
2,000 to 2,999	17.8	.39	115	9.94	6.8	.06	54	.37	.7	.01	.06	.07	7.7
3,000 or More	9.3	.24	71	6.07	3.7	.04	38	.25	.4	(*)	.03	.04	12.9

See footnotes at end of table.

Table 5.26. Total Consumption and Expenditures for Appliances in U.S. Households, 1993 (Continued)

Characteristics	Electricity				Natural Gas				Liquefied Petroleum Gas				RSE Row Factors
		Consumed		Expenditures		Consumed		Expenditures		Consumed		Expenditures	
	Households (million)	(quadrillion Btu)	(billion kWh)	(billion dollars)	Households (million)	(quadrillion Btu)	(billion cubic feet)	(billion dollars)	Households (million)	(quadrillion Btu)	(billion gallons)	(billion dollars)	
RSE Column Factors:	0.4	0.5 [1]	0.5 [1]	0.5 [1]	0.8	0.9 [1]	0.9 [1]	0.9 [1]	2.2	2.4 [1]	2.4 [1]	2.4 [1]	
Ownership of Unit													
Owned	63.2	1.26	368	31.64	24.6	0.20	192	1.29	3.8	0.02	0.26	0.32	4.7
Rented	33.4	.37	108	9.91	13.2	.09	89	.69	1.2	.01	.07	.10	6.0
Public Housing	3.4	.03	8	.75	1.4	.01	10	.07	NC	NC	NC	NC	23.4
Not Public Housing	30.0	.34	100	9.16	11.8	.08	79	.62	1.2	.01	.07	.10	6.3
Rent Subsidy	2.0	.02	5	.52	1.0	.01	7	.07	Q	Q	Q	Q	19.8
No Rent Subsidy	28.0	.32	94	8.63	10.8	.07	72	.56	1.1	.01	.06	.10	6.6
Year of Construction													
1939 or Before	20.3	.30	88	8.06	10.9	.08	76	.60	1.2	.01	.07	.09	8.2
1940 to 1949	6.9	.11	32	2.82	3.4	.02	24	.18	.3	(*)	.02	.02	13.7
1950 to 1959	13.1	.23	68	6.33	6.7	.05	51	.37	.4	(*)	.02	.03	10.4
1960 to 1969	15.0	.24	71	6.30	5.7	.04	42	.28	.7	(*)	.04	.05	10.3
1970 to 1979	18.1	.32	95	7.86	4.5	.04	35	.22	1.1	.01	.07	.09	9.5
1980 to 1984	8.5	.15	44	3.72	2.5	.02	21	.13	.4	(*)	.03	.04	13.3
1985 to 1987	5.5	.10	29	2.44	1.6	.01	11	.07	.3	(*)	.04	.04	15.0
1988 to 1990	4.7	.09	27	2.23	1.2	.01	10	.06	.3	(*)	.02	.03	14.4
1991 to 1993 [3]	4.5	.07	22	1.79	1.2	.01	10	.06	.2	(*)	.02	.02	16.8
Electric Appliances Paid by Household	**91.5**	**1.58**	**464**	**40.43**	--	--	--	--	--	--	--	--	**4.0**
Natural Gas Appliances Paid by Household	--	--	--	--	**32.7**	**.26**	**249**	**1.75**	--	--	--	--	**6.2**
Liquefied Petroleum Gas Paid by Household	--	--	--	--	--	--	--	--	**4.8**	**.03**	**.32**	**.41**	**9.9**
1993 Family Income													
Less than $5,000	4.0	.04	13	1.18	1.8	.01	13	.10	.3	(*)	.01	.02	14.1
$5,000 to $9,999	10.6	.11	34	2.94	4.3	.03	27	.21	.6	(*)	.03	.04	9.4
$10,000 to $14,999	11.1	.14	41	3.62	4.7	.03	33	.23	.8	(*)	.04	.06	7.8
$15,000 to $19,999	9.6	.15	43	3.58	3.6	.02	23	.15	.6	(*)	.05	.06	11.5
$20,000 to $24,999	8.7	.14	40	3.38	3.4	.02	23	.16	.5	(*)	.03	.04	10.5
$25,000 to $34,999	14.1	.25	73	6.16	4.6	.03	34	.23	.9	.01	.07	.08	8.7
$35,000 to $49,999	17.4	.33	97	8.55	6.6	.05	51	.36	.6	(*)	.05	.06	7.8
$50,000 to $74,999	12.6	.26	77	6.68	5.1	.04	40	.28	.3	(*)	.03	.05	8.3
$75,000 or More	8.3	.20	59	5.46	3.6	.04	37	.26	.2	(*)	.01	.02	13.3
Below Poverty Line													
100 Percent	14.4	.18	54	4.79	6.6	.05	50	.38	1.0	(*)	.05	.07	7.7
125 Percent	19.4	.26	75	6.63	8.4	.07	64	.48	1.5	.01	.08	.10	7.4
150 Percent	24.7	.34	98	8.56	10.5	.08	78	.58	1.8	.01	.10	.13	6.7
Eligible for Federal Assistance [4]	**30.6**	**.41**	**120**	**10.55**	**12.9**	**.10**	**93**	**.68**	**2.1**	**.01**	**.11**	**.15**	**6.0**
Age of Householder													
Under 25 Years	5.7	.07	20	1.68	2.0	.02	15	.11	.2	(*)	.01	.01	12.3
25 to 34 Years	19.9	.31	91	7.91	8.1	.06	61	.43	1.0	.01	.07	.09	6.7
35 to 44 Years	21.4	.42	123	10.71	8.4	.07	65	.46	1.2	.01	.10	.13	6.2
45 to 59 Years	21.9	.43	125	10.81	8.6	.08	73	.51	1.1	.01	.06	.08	7.3
60 Years and Over	27.7	.40	118	10.44	10.6	.07	67	.49	1.3	.01	.08	.10	7.4

See footnotes at end of table.

Table 5.26. Total Consumption and Expenditures for Appliances in U.S. Households, 1993 (Continued)

Characteristics	Electricity				Natural Gas				Liquefied Petroleum Gas				RSE Row Factors
		Consumed		Expenditures		Consumed		Expenditures		Consumed		Expenditures	
	Households (million)	(quadrillion Btu)	(billion kWh)	(billion dollars)	Households (million)	(quadrillion Btu)	(billion cubic feet)	(billion dollars)	Households (million)	(quadrillion Btu)	(billion gallons)	(billion dollars)	
RSE Column Factors:	0.4	0.5 [1]	0.5 [1]	0.5 [1]	0.8	0.9 [1]	0.9 [1]	0.9 [1]	2.2	2.4 [1]	2.4 [1]	2.4 [1]	
Education of Householder													
12 Years or Fewer	51.5	0.83	243	20.92	20.9	0.15	150	1.06	3.6	0.02	0.23	0.28	5.3
13 to 16 Years	33.6	.59	174	15.19	12.3	.10	96	.67	1.2	.01	.09	.12	5.3
17 Years or More	11.5	.20	60	5.44	4.5	.04	36	.26	.2	(*)	.01	.01	10.7
Race of Householder													
White	80.1	1.41	413	35.48	28.9	.22	213	1.47	4.4	.03	.29	.38	4.6
Black	10.9	.15	45	4.19	6.1	.05	50	.36	.5	(*)	.02	.03	12.1
Other [5]	5.5	.06	19	1.88	2.8	.02	19	.16	Q	Q	Q	Q	13.2
Householder of Hispanic Descent													
Yes	7.9	.10	30	2.93	4.2	.03	31	.25	.4	(*)	.02	.04	13.8
No	88.7	1.52	446	38.62	33.6	.26	251	1.73	4.5	.03	.30	.38	4.4
Household Size													
1 Person	23.5	.22	63	5.68	8.4	.04	37	.29	1.0	(*)	.05	.07	7.6
2 Persons	31.7	.51	150	12.78	11.6	.08	81	.56	1.6	.01	.09	.12	6.0
3 Persons	16.6	.31	92	8.14	6.9	.06	56	.40	.8	(*)	.05	.07	7.8
4 Persons	14.6	.33	98	8.50	6.4	.06	58	.39	.8	.01	.06	.07	7.0
5 Persons	6.8	.16	47	4.08	2.7	.03	29	.20	.6	.01	.06	.07	10.5
6 or More Persons	3.5	.09	26	2.37	1.8	.02	21	.15	.2	(*)	.01	.02	16.7

[1] This factor is underestimated because it contains no error for estimating this end use.
[2] Climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[3] Does not include all new construction for 1993.
[4] Below 150 percent of poverty line or 60 percent of median State income.
[5] Includes some householders who described themselves as Hispanic rather than White, Black, or other.
(*) = Value rounds to zero in the units displayed.
-- = Not applicable.
NC = No cases in sample.
NF = No applicable RSE row factor.
Q = Data withheld either because the Relative Standard Error (RSE) was greater than 50 percent or fewer than 10 households were sampled.
Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • Appliances do not include refrigerators. • See ''Glossary'' for definition of terms used in this report.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A-F, and H of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.27. Electricity Consumption and Expenditures for Appliances and Refrigerators, per U.S. Household, 1993

Characteristics	Electricity Used for Appliances				Electricity Used for Refrigerators					RSE Row Factors
	Households (million)	Consumed (million Btu)	Consumed (kWh)	Expenditures (dollars)	Households (million)	Average Number of Refrigerators	Consumed (million Btu)	Consumed (kWh)	Expenditures (dollars)	
RSE Column Factors:	1.6	1.0 [1]	1.0 [1]	1.0 [1]	1.6	0.4	0.9 [1]	0.9 [1]	1.1 [1]	
Total U.S. Households	**96.6**	**16.8**	**4,933**	**430**	**96.4**	**1.2**	**4.7**	**1,386**	**124**	**1.3**
Census Region and Division										
Northeast	19.5	13.9	4,077	476	19.4	1.1	3.9	1,136	137	3.4
New England	5.1	14.3	4,197	478	5.1	1.1	3.7	1,091	126	6.0
Middle Atlantic	14.4	13.8	4,035	476	14.3	1.2	3.9	1,152	141	3.9
Midwest	23.3	17.7	5,193	428	23.3	1.2	4.5	1,322	111	2.9
East North Central	16.4	17.6	5,146	439	16.4	1.2	4.5	1,317	115	4.1
West North Central	6.9	18.1	5,303	403	6.9	1.2	4.6	1,336	103	2.6
South	33.4	19.0	5,576	434	33.4	1.1	5.7	1,664	131	2.1
South Atlantic	17.3	17.9	5,247	427	17.3	1.1	5.2	1,533	126	3.1
East South Central	6.0	20.6	6,029	382	6.0	1.2	5.8	1,712	110	3.3
West South Central	10.1	20.0	5,871	477	10.1	1.1	6.3	1,858	152	4.1
West	20.4	15.0	4,399	382	20.3	1.2	4.2	1,240	116	2.8
Mountain	5.4	17.1	5,013	368	5.4	1.2	4.4	1,293	102	5.7
Pacific	15.0	14.3	4,180	387	15.0	1.2	4.2	1,221	120	3.2
Largest Populated States										
California	11.1	12.5	3,649	415	11.1	1.2	4.0	1,159	132	3.8
Florida	5.6	18.3	5,368	446	5.6	1.1	5.7	1,679	141	6.2
New York	6.8	12.1	3,542	493	6.8	1.1	3.5	1,022	149	6.2
Texas	6.4	19.9	5,838	470	6.4	1.1	6.3	1,860	151	5.6
Urban Status										
Urban	75.8	16.1	4,733	429	75.7	1.2	4.7	1,378	128	1.6
Central City	30.6	13.7	4,029	369	30.5	1.1	4.4	1,293	122	1.8
Suburban	45.2	17.8	5,209	470	45.1	1.2	4.9	1,436	132	1.5
Rural	20.8	19.3	5,665	435	20.8	1.2	4.8	1,412	110	2.4
Climate Zone [2]										
Under 2,000 CDD and Over 7,000 HDD	8.7	18.3	5,350	422	8.7	1.2	3.9	1,153	91	4.6
5,500 to 7,000 HDD	26.5	16.6	4,864	430	26.5	1.2	4.3	1,258	115	3.9
4,000 to 5,499 HDD	22.4	16.3	4,769	425	22.3	1.1	4.5	1,320	123	3.5
Under 4,000 HDD	17.8	15.1	4,435	412	17.8	1.1	4.6	1,362	128	3.8
2,000 CDD or More and Under 4,000 HDD	21.2	18.6	5,441	455	21.1	1.1	5.9	1,731	147	3.2
Total Number of Rooms (Excluding Bathrooms)										
1 or 2	3.2	5.3	1,551	158	3.2	1.0	2.8	820	83	5.2
3 to 5	47.3	12.7	3,724	329	47.2	1.1	4.1	1,213	111	1.4
6 to 8	40.2	21.1	6,198	532	40.2	1.2	5.3	1,560	137	1.5
9 or More	5.8	26.9	7,895	698	5.8	1.4	6.4	1,889	169	4.3
Type of Housing Unit										
Single-Family	66.7	19.9	5,832	500	66.7	1.2	5.2	1,537	134	1.2
Detached	59.4	20.5	5,997	510	59.4	1.2	5.3	1,557	135	1.3
Attached	7.3	15.3	4,487	412	7.3	1.1	4.7	1,377	129	4.4
Mobile Home	5.6	16.0	4,693	378	5.6	1.0	4.1	1,202	99	4.0
Multifamily	24.2	8.6	2,515	251	24.2	1.0	3.4	1,009	102	2.2
2 to 4 Units	8.0	9.7	2,839	292	8.0	1.0	3.5	1,012	107	3.1
5 or More Units	16.2	8.0	2,355	231	16.2	1.0	3.4	1,008	99	3.1
Heated Floorspace (square feet)										
Fewer than 1,000	29.3	10.0	2,937	263	29.2	1.0	3.8	1,105	103	1.8
1,000 to 1,999	40.2	17.4	5,111	444	40.1	1.1	4.8	1,402	125	1.5
2,000 to 2,999	17.8	21.9	6,421	557	17.8	1.3	5.5	1,612	142	2.1
3,000 or More	9.3	25.9	7,599	654	9.3	1.4	6.0	1,764	153	3.5

See footnotes at end of table.

Table 5.27. Electricity Consumption and Expenditures for Appliances and Refrigerators, per U.S. Household, 1993 (Continued)

Characteristics	Electricity Used for Appliances				Electricity Used for Refrigerators					RSE Row Factors
	Households (million)	Consumed (million Btu)	Consumed (kWh)	Expenditures (dollars)	Households (million)	Average Number of Refrigerators	Consumed (million Btu)	Consumed (kWh)	Expenditures (dollars)	
RSE Column Factors:	1.6	1.0 [1]	1.0 [1]	1.0 [1]	1.6	0.4	0.9 [1]	0.9 [1]	1.1 [1]	
Ownership of Unit										
Owned	63.2	19.9	5,830	501	63.2	1.2	5.2	1,536	135	1.3
Rented	33.4	11.0	3,238	297	33.3	1.0	3.8	1,100	104	1.8
Public Housing	3.4	8.4	2,459	219	3.4	1.0	3.4	1,000	89	5.5
Not Public Housing	30.0	11.4	3,327	305	29.8	1.0	3.8	1,111	106	1.9
Rent Subsidy	2.0	9.4	2,756	264	2.0	1.0	3.3	972	97	6.3
No Rent Subsidy	28.0	11.5	3,368	308	27.9	1.0	3.8	1,121	106	2.1
Year of Construction										
1939 or Before	20.3	14.9	4,353	397	20.3	1.1	4.2	1,240	116	2.5
1940 to 1949	6.9	16.0	4,692	409	6.9	1.2	4.7	1,381	126	3.7
1950 to 1959	13.1	17.7	5,179	484	13.1	1.2	5.1	1,481	142	3.0
1960 to 1969	15.0	16.1	4,720	419	15.0	1.2	4.8	1,421	129	3.1
1970 to 1979	18.1	17.8	5,214	433	18.1	1.1	5.0	1,464	125	2.5
1980 to 1984	8.5	17.8	5,208	440	8.5	1.1	5.2	1,524	131	3.4
1985 to 1987	5.5	18.1	5,295	444	5.5	1.1	4.7	1,379	118	4.1
1988 to 1990	4.7	19.9	5,822	473	4.7	1.1	4.5	1,325	111	3.8
1991 to 1993 [3]	4.5	16.7	4,896	400	4.5	1.1	3.9	1,152	96	5.4
Electricity Paid by Household										
Yes	91.5	17.3	5,070	442	91.4	1.2	4.8	1,408	126	1.3
No	5.1	8.4	2,472	220	5.0	1.0	3.3	976	88	5.2
1993 Family Income										
Less than $5,000	4.0	10.7	3,143	292	4.0	1.1	4.0	1,176	110	4.8
$5,000 to $9,999	10.6	10.9	3,191	278	10.5	1.1	4.2	1,226	111	2.9
$10,000 to $14,999	11.1	12.5	3,663	325	11.1	1.1	4.2	1,227	112	2.7
$15,000 to $19,999	9.6	15.1	4,426	372	9.6	1.1	4.5	1,306	114	2.8
$20,000 to $24,999	8.7	15.6	4,583	386	8.7	1.1	4.5	1,326	115	3.0
$25,000 to $34,999	14.1	17.7	5,192	439	14.0	1.2	4.9	1,423	123	2.4
$35,000 to $49,999	17.4	19.0	5,580	490	17.4	1.2	4.8	1,401	126	2.3
$50,000 to $74,999	12.6	20.9	6,126	529	12.6	1.2	5.2	1,525	136	2.5
$75,000 or More	8.3	24.1	7,058	654	8.3	1.3	6.0	1,747	166	3.6
Below Poverty Line										
100 Percent	14.4	12.8	3,751	333	14.3	1.1	4.2	1,230	112	2.6
125 Percent	19.4	13.3	3,894	342	19.3	1.1	4.2	1,240	113	2.3
150 Percent	24.7	13.6	3,987	347	24.6	1.1	4.3	1,265	114	2.1
Eligible for Federal Assistance [4]	**30.6**	**13.4**	**3,913**	**345**	**30.6**	**1.1**	**4.3**	**1,247**	**114**	**1.8**
Age of Householder										
Under 25 Years	5.7	11.7	3,439	294	5.7	1.1	3.8	1,120	97	3.8
25 to 34 Years	19.9	15.5	4,554	397	19.9	1.1	4.0	1,176	106	1.9
35 to 44 Years	21.4	19.6	5,733	501	21.3	1.1	4.7	1,376	123	1.7
45 to 59 Years	21.9	19.6	5,734	495	21.9	1.2	5.2	1,535	136	2.0
60 Years and Over	27.7	14.6	4,267	376	27.7	1.2	5.0	1,480	134	2.0
Education of Householder										
12 Years or Fewer	51.5	16.1	4,719	406	51.4	1.1	4.7	1,373	121	1.5
13 to 16 Years	33.6	17.7	5,178	452	33.6	1.2	4.8	1,399	126	1.7
17 Years or More	11.5	17.7	5,177	472	11.5	1.2	4.8	1,401	130	3.2
Race of Householder										
White	80.1	17.6	5,149	443	80.1	1.2	4.8	1,404	124	1.4
Black	10.9	14.0	4,111	385	10.9	1.1	4.7	1,366	129	3.2
Other [5]	5.5	11.7	3,431	339	5.5	1.1	4.0	1,163	120	4.3

See footnotes at end of table.

Table 5.27. Electricity Consumption and Expenditures for Appliances and Refrigerators, per U.S. Household, 1993 (Continued)

Characteristics	Electricity Used for Appliances				Electricity Used for Refrigerators					RSE Row Factors
	Households (million)	Consumed (million Btu)	Consumed (kWh)	Expenditures (dollars)	Households (million)	Average Number of Refrigerators	Consumed (million Btu)	Consumed (kWh)	Expenditures (dollars)	
RSE Column Factors:	1.6	1.0 [1]	1.0 [1]	1.0 [1]	1.6	0.4	0.9 [1]	0.9 [1]	1.1 [1]	
Householder of Hispanic Descent										
Yes	7.9	13.0	3,798	371	7.9	1.1	4.1	1,213	121	3.7
No	88.7	17.2	5,034	436	88.6	1.2	4.8	1,401	124	1.3
Average Electricity Expenditures (cents per kWh)										
Less than 6	9.3	22.8	6,694	348	--	--	--	--	--	3.9
6 to Less than 9	42.7	19.4	5,686	435	--	--	--	--	--	2.2
9 or More	44.6	13.1	3,845	443	--	--	--	--	--	2.0
Average Electric Refrigerator Expenditures (cents per kWh)										
Less than 6	--	--	--	--	9.3	1.2	5.4	1,568	82	3.9
6 to Less than 9	--	--	--	--	42.6	1.2	5.3	1,551	119	2.2
9 or More	--	--	--	--	44.6	1.1	4.1	1,190	138	2.0
Electric Appliances Used by Household (more than one may apply)										
Separate Freezer	33.4	23.1	6,771	558	33.4	1.2	5.2	1,531	127	1.5
Dishwasher	43.7	20.6	6,039	520	43.7	1.2	5.3	1,543	135	1.6
Clothes Washer	74.5	19.6	5,731	493	74.4	1.2	5.1	1,486	130	1.3
Clothes Dryer	54.7	21.0	6,144	506	54.6	1.2	5.1	1,508	126	1.3
Waterbed Heater	11.9	24.3	7,131	572	11.9	1.2	5.1	1,490	121	2.5
Swimming-Pool Pump	4.6	32.5	9,530	850	4.6	1.3	6.3	1,848	164	4.4
Hot-Tub or Spa Pump	2.8	33.4	9,788	803	2.8	1.4	6.7	1,958	166	5.1
Hot-Tub or Spa Heater	1.9	31.5	9,241	733	1.9	1.4	6.2	1,813	148	6.0
Well Pump	13.0	24.2	7,087	580	13.0	1.3	5.5	1,608	133	3.1
Appliance Combination Usage										
Dishwasher, Clothes Washer, and Clothes Dryer										
All	30.2	23.1	6,769	558	30.2	1.2	5.5	1,611	135	1.8
Some	49.7	16.2	4,755	426	49.7	1.2	4.7	1,366	125	1.4
None	16.6	7.3	2,127	210	16.5	1.0	3.5	1,032	103	2.3
Well Pump and Separate Freezer										
All	8.0	27.1	7,934	627	8.0	1.3	5.6	1,646	129	3.9
Some	30.4	21.5	6,295	531	30.4	1.2	5.1	1,503	129	1.5
None	58.2	13.0	3,813	351	58.1	1.1	4.4	1,289	121	1.4
Main Heating Fuel										
Natural Gas	51.4	16.4	4,799	438	51.3	1.2	4.7	1,390	130	1.8
Electricity	25.0	16.5	4,850	363	25.0	1.1	4.8	1,395	108	2.5
Fuel Oil or Kerosene	11.2	17.2	5,034	513	11.2	1.2	4.3	1,265	134	3.6
Wood	3.1	23.0	6,750	536	3.1	1.2	5.0	1,468	119	4.8
LPG	4.6	19.8	5,809	472	4.6	1.2	5.1	1,495	123	4.6
Other	.4	15.6	4,585	312	.4	1.0	4.1	1,211	85	14.7
Household Size										
1 Person	23.5	9.2	2,698	242	23.4	1.1	4.0	1,182	109	2.5
2 Persons	31.7	16.1	4,717	403	31.7	1.2	5.0	1,466	129	1.7
3 Persons	16.6	19.0	5,562	491	16.6	1.2	4.8	1,416	128	2.2
4 Persons	14.6	22.9	6,699	582	14.6	1.2	4.9	1,437	127	2.0
5 Persons	6.8	23.8	6,973	604	6.8	1.2	4.9	1,438	126	2.9
6 or More Persons	3.5	26.0	7,632	685	3.5	1.2	5.3	1,564	147	5.6

See footnotes at end of table.

Table 5.27. Electricity Consumption and Expenditures for Appliances and Refrigerators, per U.S. Household, 1993 (Continued)

Characteristics	Electricity Used for Appliances				Electricity Used for Refrigerators					RSE Row Factors
	Households (million	Consumed (million Btu)	Consumed (kWh)	Expenditures (dollars)	Households (million	Average Number of Refrigerators	Consumed (million Btu)	Consumed (kWh)	Expenditures (dollars)	
RSE Column Factors:	1.6	1.0 [1]	1.0 [1]	1.0 [1]	1.6	0.4	0.9 [1]	0.9 [1]	1.1 [1]	
Number of Refrigerators										
1	82.1	15.7	4,614	406	82.1	1.0	4.1	1,194	108	1.2
2 or More	14.4	23.1	6,785	573	14.4	2.1	8.5	2,480	215	2.2

[1] This factor is underestimated because it contains no error for estimating this end use.
[2] Climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[3] Does not include all new construction for 1993.
[4] Below 150 percent of poverty line or 60 percent of median State income.
[5] Includes some householders who described themselves as Hispanic rather than White, Black, or other.
-- = Not applicable.
Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • See ''Glossary'' for definition of terms used in this report.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A, B, C, E, and H of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Table 5.28. Natural Gas and LPG Consumption and Expenditures for Appliances, per U.S. Household, 1993

Characteristics	Natural Gas				Liquefied Petroleum Gas				RSE Row Factors
		Consumed				Consumed			
	Households (million)	(million Btu)	(1000 cubic feet)	Expenditures (dollars)	Households (million)	(million Btu)	(gallons)	Expenditures (dollars)	
RSE Column Factors:	0.9	0.5 [1]	0.5 [1]	0.6 [1]	2.5	1.3 [1]	1.3 [1]	1.5 [1]	
Total U.S. Households	**37.8**	**7.7**	**7.5**	**53**	**4.9**	**6.0**	**66**	**85**	**4.0**
Census Region and Division									
Northeast	10.1	7.6	7.4	72	1.0	5.1	56	97	6.8
New England	1.7	8.5	8.3	81	.4	4.8	53	91	17.0
Middle Atlantic	8.4	7.4	7.2	70	.6	5.3	58	102	7.3
Midwest	10.4	7.5	7.3	41	1.1	7.0	76	66	6.3
East North Central	7.9	7.7	7.5	42	.5	6.2	68	61	8.3
West North Central	2.4	7.1	6.9	38	.6	7.6	84	71	9.8
South	8.7	8.8	8.5	54	2.4	6.1	66	88	8.2
South Atlantic	2.9	7.7	7.5	57	1.4	6.5	71	113	8.6
East South Central	1.1	9.5	9.2	51	.5	5.8	63	60	17.3
West South Central	4.7	9.3	9.0	53	.5	5.2	57	47	18.2
West	8.6	6.8	6.6	42	.4	5.8	63	83	7.9
Mountain	1.6	6.5	6.4	37	.2	5.7	62	68	11.6
Pacific	7.0	6.9	6.7	43	.2	5.8	64	100	9.6
Largest Populated States									
California	6.6	6.8	6.6	43	.2	6.3	69	103	8.6
Florida	.3	7.2	7.0	67	.7	7.7	85	136	17.1
New York	4.5	7.3	7.1	83	.3	4.8	52	91	10.6
Texas	2.8	9.1	8.8	52	Q	3.2	34	30	21.8
Urban Status									
Urban	33.9	7.7	7.5	54	2.2	6.1	67	95	4.7
Central City	16.2	7.3	7.1	54	.5	5.6	62	90	8.4
Suburban	17.8	8.1	7.8	53	1.7	6.2	68	96	6.2
Rural	3.8	7.4	7.2	43	2.8	6.0	65	77	9.9
Climate Zone [2]									
Under 2,000 CDD and Over 7,000 HDD	2.1	6.8	6.6	37	.8	5.8	63	75	9.9
5,500 to 7,000 HDD	12.2	7.6	7.4	49	.9	6.0	65	81	8.1
4,000 to 5,499 HDD	9.2	7.5	7.3	67	.9	6.2	68	89	7.8
Under 4,000 HDD	7.3	7.1	6.9	45	.7	5.6	62	85	8.9
2,000 CDD or More and Under 4,000 HDD	7.0	8.7	8.5	52	1.7	6.2	68	90	11.1
Total Number of Rooms (Excluding Bathrooms)									
1 or 2	1.3	4.4	4.2	48	Q	Q	Q	Q	14.1
3 to 5	17.8	6.7	6.5	48	3.0	5.6	62	81	4.7
6 to 8	16.1	8.4	8.2	54	1.7	6.2	68	83	5.7
9 or More	2.6	11.8	11.5	75	.2	11.7	128	174	16.4
Type of Housing Unit									
Single-Family	26.6	8.1	7.8	52	3.2	6.0	65	83	4.9
Detached	23.1	8.2	7.9	51	3.2	6.0	65	84	5.1
Attached	3.5	7.4	7.2	53	Q	Q	Q	Q	10.4
Mobile Home	1.5	6.3	6.2	37	1.5	6.2	68	86	8.4
Multifamily	9.7	6.8	6.6	57	.2	5.5	60	106	7.7
2 to 4 Units	4.2	7.8	7.6	61	.1	5.5	60	108	11.0
5 or More Units	5.5	6.0	5.8	54	Q	Q	Q	Q	6.7
Heated Floorspace (square feet)									
Fewer than 1,000	11.2	6.4	6.2	49	2.0	5.6	61	82	6.5
1,000 to 1,999	16.1	7.6	7.4	51	1.8	5.8	63	76	5.8
2,000 to 2,999	6.8	8.2	8.0	54	.7	7.1	78	102	7.6
3,000 or More	3.7	10.7	10.4	68	.4	7.5	82	107	13.0

See footnotes at end of table.

Table 5.28. Natural Gas and LPG Consumption and Expenditures for Appliances, per U.S. Household, 1993 (Continued)

Characteristics	Natural Gas				Liquefied Petroleum Gas				RSE Row Factors
		Consumed				Consumed			
	Households (million)	(million Btu)	(1000 cubic feet)	Expenditures (dollars)	Households (million)	(million Btu)	(gallons)	Expenditures (dollars)	
RSE Column Factors:	0.9	0.5 [1]	0.5 [1]	0.6 [1]	2.5	1.3 [1]	1.3 [1]	1.5 [1]	
Ownership of Unit									
Owned	24.6	8.0	7.8	52	3.8	6.3	69	85	4.9
Rented	13.2	7.0	6.8	53	1.2	5.3	58	84	5.0
Public Housing	1.4	7.3	7.1	50	NC	NC	NC	NC	15.0
Not Public Housing	11.8	6.9	6.7	53	1.2	5.3	58	84	5.3
Rent Subsidy	1.0	7.5	7.3	68	Q	Q	Q	Q	13.1
No Rent Subsidy	10.8	6.9	6.7	52	1.1	5.2	57	84	5.6
Year of Construction									
1939 or Before	10.9	7.2	7.0	55	1.2	5.8	63	77	6.4
1940 to 1949	3.4	7.3	7.1	52	.3	6.3	69	87	11.5
1950 to 1959	6.7	7.9	7.7	55	.4	5.2	57	78	8.7
1960 to 1969	5.7	7.5	7.3	49	.7	5.0	55	73	8.0
1970 to 1979	4.5	8.0	7.8	50	1.1	5.8	63	83	10.6
1980 to 1984	2.5	8.6	8.4	54	.4	6.3	69	91	13.7
1985 to 1987	1.6	7.2	7.0	46	.3	9.8	108	133	12.7
1988 to 1990	1.2	8.8	8.5	52	.3	6.3	68	101	11.4
1991 to 1993 [3]	1.2	8.6	8.4	52	.2	6.5	71	78	12.4
Natural Gas Appliances Paid by Household									
Yes	32.7	7.8	7.6	53	--	--	--	--	4.2
No	5.1	6.7	6.5	46	--	--	--	--	9.1
Liquefied Petroleum Gas Paid by Household									
Yes	--	--	--	--	4.8	6.1	66	85	4.1
No	--	--	--	--	.1	4.8	53	64	11.7
1993 Family Income									
Less than $5,000	1.8	7.2	7.1	56	.3	4.0	44	61	10.4
$5,000 to $9,999	4.3	6.5	6.3	49	.6	4.2	46	63	8.7
$10,000 to $14,999	4.7	7.1	6.9	48	.8	4.9	53	68	6.8
$15,000 to $19,999	3.6	6.8	6.6	43	.6	7.1	77	101	11.8
$20,000 to $24,999	3.4	7.0	6.8	47	.5	5.7	62	78	10.5
$25,000 to $34,999	4.6	7.5	7.3	50	.9	6.7	73	85	8.6
$35,000 to $49,999	6.6	7.9	7.6	54	.6	7.5	82	100	7.4
$50,000 to $74,999	5.1	8.2	8.0	56	.3	8.9	97	141	8.4
$75,000 or More	3.6	10.5	10.3	72	.2	5.2	57	88	13.0
Below Poverty Line									
100 Percent	6.6	7.8	7.6	57	1.0	4.7	51	69	5.8
125 Percent	8.4	7.8	7.6	57	1.5	4.6	51	66	6.2
150 Percent	10.5	7.7	7.5	55	1.8	4.9	54	70	5.7
Eligible for Federal Assistance [4]	**12.9**	**7.4**	**7.2**	**53**	**2.1**	**4.9**	**54**	**70**	**5.1**
Age of Householder									
Under 25 Years	2.0	7.5	7.3	52	.2	3.9	43	57	9.7
25 to 34 Years	8.1	7.7	7.5	53	1.0	6.4	70	87	5.2
35 to 44 Years	8.4	8.0	7.7	54	1.2	7.4	81	108	6.4
45 to 59 Years	8.6	8.7	8.5	59	1.1	5.2	57	72	6.8
60 Years and Over	10.6	6.5	6.4	46	1.3	5.6	61	78	8.8
Education of Householder									
12 Years or Fewer	20.9	7.4	7.2	51	3.6	5.8	63	79	4.9
13 to 16 Years	12.3	8.0	7.7	54	1.2	6.9	76	104	5.8
17 Years or More	4.5	8.1	7.9	57	.2	5.5	60	81	11.2

See footnotes at end of table.

Table 5.28. Natural Gas and LPG Consumption and Expenditures for Appliances, per U.S. Household, 1993 (Continued)

Characteristics	Natural Gas				Liquefied Petroleum Gas				RSE Row Factors
		Consumed				Consumed			
	Households (million)	(million Btu)	(1000 cubic feet)	Expenditures (dollars)	Households (million)	(million Btu)	(gallons)	Expenditures (dollars)	
RSE Column Factors:	0.9	0.5 [1]	0.5 [1]	0.6 [1]	2.5	1.3 [1]	1.3 [1]	1.5 [1]	
Race of Householder									
White	28.9	7.6	7.4	51	4.4	6.2	68	86	4.6
Black	6.1	8.4	8.2	59	.5	4.6	50	68	8.5
Other [5]	2.8	6.8	6.6	55	Q	Q	Q	Q	8.8
Householder of Hispanic Descent									
Yes	4.2	7.6	7.4	61	.4	5.0	55	87	9.7
No	33.6	7.7	7.5	52	4.5	6.1	67	85	4.2
Household Size									
1 Person	8.4	4.5	4.4	34	1.0	4.9	54	74	11.0
2 Persons	11.6	7.1	6.9	48	1.6	5.2	57	73	5.9
3 Persons	6.9	8.4	8.2	58	.8	5.9	65	82	6.0
4 Persons	6.4	9.3	9.0	61	.8	6.4	70	91	7.0
5 Persons	2.7	11.0	10.7	74	.6	9.4	103	129	9.0
6 or More Persons	1.8	12.3	12.0	83	.2	6.8	75	97	11.9

[1] This factor is underestimated because it contains no error for estimating this end use.
[2] Climate zones are based on annual degree-days that are averaged over 30 years from 1961 to 1990.
[3] Does not include all new construction for 1993.
[4] Below 150 percent of poverty line or 60 percent of median State income.
[5] Includes some householders who described themselves as Hispanic rather than White, Black, or other.
-- = Not applicable.
NC = No cases in sample.
NF = No applicable RSE row/column factor.
Q = Data withheld either because the Relative Standard Error (RSE) was greater than 50 percent or fewer than 10 households were sampled.
Notes: • To obtain the RSE percentage for any table cell, multiply the corresponding column and row factors. • Because of rounding, data may not sum to totals. • See ''Glossary'' for definition of terms used in this report.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A, B, C, D, and F of the 1993 Residential Energy Consumption Survey (for specific titles of forms, see Appendix E).

Appendix A

How the Survey Was Conducted

Appendix A

How the Survey Was Conducted

Introduction

The Residential Energy Consumption Survey (RECS) was designed by the Energy Information Administration (EIA) to provide information about energy consumption within the residential sector. The RECS is conducted in two major parts: the Household Survey and the Energy Suppliers Survey. The Household Survey collects information about the housing unit through personal interviews with a representative national sample of households. In the Energy Suppliers Survey, data concerning actual energy consumption are obtained from household billing records maintained by the energy suppliers. The data are collected by questionnaires mailed to all the suppliers for the households in the Household Survey. Copies of the data collection forms for the Household Survey and the adjunct Rental Agent Survey are reproduced in Appendix E, "Survey Forms."

This appendix contains detailed information about the Sample Design, Household Survey, its adjunct Rental Agent Survey, Energy Supplier Survey, Weather and Price Data, Special Data Collection for the Administration for Children and Families, Confidentiality of the Data, and Public Use Data File Preparation.

Sample Design

The universe for the RECS includes all housing units occupied as a primary residence in the 50 States and the District of Columbia, which was estimated to be 96,631,000 households as of July 1993. These data represent a change from past RECS, where the date was November of the survey year. The change was made to give greater weight to the consumption and expenditures data, which are collected for calendar year 1993 for which July 1993 is the midpoint. The change means the time separation between the date used to estimate the universe of households for the 1993 RECS is 2 2/3 years following the date used for the 1990 RECS. Estimates of annual change need to consider that the period covered was less than 3 years.

Since 1980, each RECS has used a multistage probability sample design to select a representative sample of U.S. households. This sample design was developed especially for the RECS. The sample for the 1993 RECS was redesigned to reflect population figures newly available from the 1990 Decennial Census.[22]

The overall plan for the 1993 RECS included a basic sample of approximately 5,000 completed household interviews, plus supplemental samples totaling approximately 2,050 completed interviews. The basic sample was designed to represent the total population of households in the United States, with specified levels of precision for each of the nine geographically defined Census divisions. The supplemental samples, included in the plan to meet special analytical needs, were designed to provide disproportionately large samples of (1) new housing units (construction completed in 1987 or later) and (2) households living below the poverty level, particularly those using electricity, fuel oil, or kerosene as the main space-heating fuel.

Multistage Area Probability Sample

In the sample design used for the 1993 RECS, the total land area of the 50 States and the District of Columbia was divided into 1,786 Primary Sampling Units (PSU's). These PSU's were based on county and independent city boundary lines, population characteristics,[23] and Metropolitan Statistical Areas (MSA's) as defined in June 1990.

[22]For more details about the RECS sample design for the 1993 RECS as well as earlier RECS, see Energy Information Administration, *Sample Design for the Residential Energy Consumption Survey*, DOE/EIA-0555(94)/1 (August 1994).

[23]Boundary definitions for counties, independent cities, and equivalent units were generally those used by the Census of Population and Housing, 1990. There were 3,140 such units in the 1990 Census. Prior to 1983, MSA's were referred to as Standard Metropolitan Statistical Areas. Additional detail on RECS sample design can be found in Energy Information Administration, *Sample Design for the Residential Energy Consumption Survey,* DOE/EIA-0555(94)\1 (August 1994).

The nine geographically defined Census divisions were a primary mode of stratification of PSU's in the 1993 RECS sample design. Strata were separately defined, within Census divisions, for four States with large populations (California, Florida, New York, and Texas) and for Alaska and Hawaii because of their unique weather conditions. Stratification was also based on metropolitan or nonmetropolitan definitions of PSU's and, to the extent feasible, on dominant residential space-heating fuel and weather conditions. PSU's were grouped into 116 strata (Figure A1).

In some cases, a single PSU comprising all or part of a large metropolitan area was large enough in population to be a stratum by itself. PSU's of this type are called Self-Representing (SR) because the sample from each PSU represents only that PSU. In other strata, one PSU was selected from among two or more PSU's in the stratum. Each of the PSU's selected from these strata is called Non-Self-Representing (NSR) because each PSU also represents the nonselected PSU's in its stratum. Of the 116 strata in the 1993 RECS sample design, 31 are SR PSU's and 85 are NSR.

Procedures for selection of specific PSU's from the NSR strata maximized the retention of PSU's from the preceding RECS design.[24] The benefits of retaining PSU's from the 1984 design included savings in housing unit listing and interviewer recruiting in some PSU's and the reduction of variance in estimates of change across time. PSU's were retained from the earlier design in all but 22 of the 116 strata.

Households in the 1993 RECS sample were selected from 1,610 second-stage sampling units (SSU's) or listing segments. Some 149 of the SSU's used for the 1993 RECS were a supplement to the basic design, specially selected in areas that were expected (on the basis of Census statistics or a canvass of informed local sources) to include large proportions of new housing units.

In 35 of the 116 PSU's, SSU's from the 1984 design were carried over to the 1993 RECS; newly selected SSU's were used in the remaining 81 PSU's. In the plan for the 1996 RECS, newly selected SSU's will replace all of the SSU's carried over from the 1984 design.

Listing segments in the 1993 RECS design consist of one or more Census blocks selected directly from Census statistics based on the 1990 enumeration. In the selection process, blocks were combined as necessary to create segments with a minimum of 50 housing units (a minimum of 96 housing units was used for the supplemental group of new construction SSU's). Prior to selection, blocks within PSU's were stratified geographically. Within MSA PSU's, there was an additional stratification by energy-related characteristics, including income estimates and other variables contained in census data.[25]

Detailed field listings were created by field workers who visited the segment and identified each housing unit by street address, apartment number, or other obvious features.

Following the field-listing step, a *penultimate cluster* of approximately 50 housing units was selected from each listing segment. Addresses of these housing units were placed in a computer file used for actual sample selection. An ultimate cluster of housing units to be contacted for interview (averaging about six housing units for the 1993 RECS) is randomly selected by computer from the penultimate cluster, and these housing units constituted the assignments given to interviewers.

Populations of Special Interest

Two populations were of particular interest in the 1993 RECS: (1) households living below the poverty level, and (2) new housing units. Two supplemental samples were created by oversampling each of these populations.

[24] Leslie Kish and Alistair Scott, "Retaining Units After Changing Strata and Probabilities," *Journal of the American Statistical Association*, Vol. 66, Number 335, Applications Section (September, 1971).

[25] Procedures used to select SSU's for the 1993 RECS design differed somewhat from procedures that were used for selection of SSU's carried over from the 1984 design. The stratification by energy-related characteristics was not used in the 1984 design. SSU's in the 1984 design were generally much larger (usually complete Census tracts or enumeration districts) and were divided into many listing segments with a minimum of 25 housing units per listing segment. One such listing segment was selected for the 1993 RECS.

Figure A1. Multistage Area Probability Sample Activities for the 1993 RECS

Households Living Below The Poverty Level. Households living below the poverty level have been of interest in some earlier RECS, most recently in 1987. The purpose of oversampling these households is to meet the analytical needs of the Office of Family Assistance, Family Support Administration (FSA). The FSA is interested in households living below the poverty level that use electricity, fuel oil, or kerosene as the main space-heating fuel. The number of households in the population using these fuels is smaller than the number using natural gas. Consequently, these households had to be oversampled in the 1993 RECS sample design to insure that an adequate number of them were included in the final sample.

New Housing Units. The 1993 survey is the first RECS to include an oversample of newly built housing units. The oversample was included in the 1993 RECS because of the importance of obtaining accurate data on the energy characteristics of new housing units. For the 1993 survey, new construction includes housing units completed in 1987 or later and covering the approximately 6 ½ years preceding the field period for the 1993 RECS. Procedures were designed to include new single-family and multifamily units, new construction in older neighborhoods, and clusters of new construction.

Procedures for oversampling each of the populations were based on interviewer observations and judgments recorded during interviewer visits to sample segments prior to the actual interviewing field period. After completing their listing of housing units in the listing segment, interviewers were instructed to rate the general income level of these households based on their observations and their general knowledge of the area. Interviewers placed each listing segment into one of four groups: wealthy (highest 25 percent), upper middle class (second quartile), lower middle class (third quartile), or poor or near poor (lowest 25 percent). Whenever possible, listing segments that were rated on income were also rated on main home-heating fuel.

In addition to rating the income level of households in each listing segment, interviewers were also instructed to judge the year that construction was completed for each housing unit listed. Interviewers made inquiries among neighborhood residents and informed community sources, as necessary, in order to arrive at their classification of date of construction. Housing units were classified in the following groups: (1) almost certainly built in 1987 or later, (2) probably built in 1987 or later, (3) probably built before 1987, and (4) almost certainly built before 1987.

The selection of additional housing units in the two populations of interest was accomplished by increasing the sampling rates of these groups. The new housing units were selected by increasing sampling rates for all housing units judged to be "new" regardless of income and heating-fuel classifications. The oversampling of housing units for the below-poverty-level households was carried out only for "old" housing units in selected segments. Listing segments used for the below-poverty-level supplement and the relative sampling rates used for specific classes of housing units are shown in Table A1.

Table A1. Relative Sampling Rates Based on Income Rating and Main Home-Heating Fuels: Housing Units Classified as Built Before 1987

Main Home-Heating Fuel	Income Rating		
	Upper Middle or Highest	Lower Middle	Poor or Near Poor
Electricity or Fuel Oil/Kerosene	1.0	1.3	2.3
All Other Fuels	1.0	1.0	1.8

Source: Energy Information Administration, Office of Energy Markets and End Use, The 1993 Residential Energy Consumption Survey.

A relative sampling rate of 1.0 in Table A1 means that the overall sampling rate applied to households in a sample segment is the rate established for the basic sample. Relative sampling rates higher than 1.0 were used for households in the oversampled groups shown in Table A1. (For example, a relative sampling rate of 1.3 means that households in the group were sampled at a rate 30 percent higher than the rate established for the basic sample.)

It is not possible to divide the sample into the basic sample and supplemental sample, but it is possible to estimate how many observations of various types were added as a result of the supplemental new construction sample and the supplemental low-income sample (Tables A2 and A3).

An estimated 857 interviews were completed in the households selected as part of the low-income supplement.[26] Some 32.3 percent of completed interviews in the supplemental sample were with households living below the poverty level, compared with 15.2 percent of completed interviews in the main sample. The corresponding figures for the Low-Income Home Energy Assistance Program (LIHEAP) level were 55.1 percent and 32.0 percent, respectively.

Table A2. Poverty Status and Home-Heating Fuels in the 1993 RECS: Main and Supplemental Low-Income Samples

Poverty Status and Home-Heating Fuel	Basic Sample Households		Supplemental Sample Households	
	Number	Percent	Number	Percent
All Households	4,921	100.0	857	100.0
Below Poverty Level	749			
Electricity	196	4.0	74	8.6
Fuel Oil/Kerosene	88	1.8	31	3.6
Other Fuels	465	9.5	173	20.1
Not Below Poverty Level	4,172	84.8	580	67.7
Below LIHEAP Level	1,574	32.0	472	55.1
Electricity	399	8.1	133	15.5
Fuel Oil/Kerosene	198	4.0	63	7.3
Other Fuels	977	19.9	277	32.3
Not Below LIHEAP Level	3,347	68.0	385	44.9

Notes: ●Households are classified according to the poverty status of the family or nonfamily householder. The actual reference period for income reported in the 1993 RECS was the 12 months preceding the RECS interview; the interview date for most households was within the final calendar quarter of 1993. ●Table shows unweighted numbers and percentages of completed units. ●See Glossary for the definition of poverty.

Source: Energy Information Administration, Office of Energy Markets and End Use, the 1993 Residential Energy Consumption Survey.

The supplemental sample of new housing units was selected at a uniform sampling rate for all housing units judged to be constructed in 1987 or later. An estimated 1,333 interviews were completed in housing units that were part of the new housing unit supplement (Table A3). Based on responses to pertinent questions in the household interview, some 60.9 percent of housing units in the supplement were actually completed in 1987 or later, compared with 10.1 percent of housing units in the basic sample.

Table A3. Housing Units Constructed in 1987 or Later in 1993 RECS: Basic and Supplemental New Construction Samples

Year Construction of Housing Unit Completed	Basic Sample Households		Supplemental Sample Households	
	Number	Percent	Number	Percent
All Households	4,921	100.0	1,333	100.0
1987 or Later	495	10.1	813	60.9
Before 1987	4,425	89.9	521	39.1

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457, A and B of the 1993 Residential Energy Consumption Survey (RECS). RECS Public Use Data Files and unreleased data.

Household Survey

A complete RECS interview consists of a completed household questionnaire and a signed Authorization Form. Interviewers used Form EIA-457A, "Household Questionnaire," to conduct the personal interviews in the sampled housing units. The Authorization Form allowed the interviewing contractor to obtain records of energy consumption from the housing unit's energy supplier(s).

[26] For each observation, the contribution to the basic sample and each of the supplemental samples can be estimated by using the observation probability of selection, assuming only the basic sample was selected (basic sample probability) and the probability of selection, by assuming that the basic sample and the supplemental samples were selected (total sample probability). If the basic sample probability equaled the total sample probability, the observation was part of the basic sample. If the basic sample probability was less than the total sample probability, then the observation could have been in either the basic sample or one of the supplemental samples. In this case, the ratio of the basic sample probability to the total sample probability is used to assign a portion of the sample to the basic sample and a portion to the supplemental samples. (Note that this ratio equals the inverse of the ratio of the sampling rate for the basic sample to sampling rate for the total sample.) In particular, if the basic sample probability is 60 percent of the total sample probability, then the observation counts as 0.6 observations in the basic sample and 0.4 observations in either of the two supplemental samples. Which supplemental sample gets the estimated 0.4 observations can be determined by the type of SSU, interviewer's judgment of the age of the housing units, and the interviewer's judgment of the income of the households in the listing segment.

A total of 9,869 units were eligible to participate in the RECS. Completed interviews were obtained for 7,111 (81.2 percent) of these households. This section describes the procedures involved in collecting the completed interviews.

Conducting the Interviews

Data Collection Dates

Approximately three-quarters of the personal interviews were completed between October 1993 and mid-February 1994; 99 percent were completed by mid-March 1994. In a few sample locations with low response rates, interviewing continued through March 1994. Telephone interviewing began late in March 1994 and continued through late April. We continued to receive Authorization Forms throughout May 1994. All of the 115 completed mail questionnaires were received in May 1994.

The Interview

The interviews were conducted with the householder or the householder's spouse and lasted , on average, 64 minutes, with 78 percent of the interviews lasting between 30 and 75 minutes. The questions covered energy-related features of the housing unit, such as the type and amount of insulation, the number of windows and doors, the type of heating and cooling systems, the fuels used for heating and cooling, energy conservation improvements, the receipt of government assistance for the cost of heating, and demographic data on household members. The interview also collected information about the characteristics and use of vehicles available to the household for use in the Residential Transportation Energy Consumption Survey.

At the end of the interview, respondents were asked to sign an Authorization Form and the interviewer also measured the dimensions of the housing unit. (See "Estimates of Housing Unit Size" in Appendix B, "Quality of the Data.")

Interviewer Training

In October 1993, three-day regional training sessions were held in four cities: Chicago, Illinois; Los Angeles, California; Atlanta, Georgia; and Washington, District of Columbia. These sessions were attended by 212 (91 percent) of the 234 interviewers who completed at least one personal interview. Each session was led by a group of trainers who had attended a two-day trainers' workshop in Princeton, New Jersey. All training sessions were monitored by Department of Energy staff.

Training materials, including a 138-page manual, *Instructions for Interviewers, 1993 RECS*, were sent to all interviewers prior to the training session. All interviewers were required to review the training materials and complete a practice interview before attending the training session. These practice interviews were sent to the survey contractor, evaluated by the contractor's staff, and returned to the interviewers at their training session. A completed evaluation form accompanied each practice questionnaire and, where appropriate, comments were written in the questionnaire margins.

The three-day training session for interviewers was based largely on the *Instructions for Interviewers, 1993 RECS* manual. The training sessions included: discussion of general interviewing techniques, background on the Residential Energy Consumption Survey series, instruction on sampling issues and the use of the address lists, a question-by-question review of the household questionnaire, procedures for measuring respondents' homes, a discussion of how to find and record Vehicle Identification Numbers (VIN's), and a review of administrative requirements. In one large meeting, one of two senior trainers instructed the entire group of interviewers on basic concepts. Interviewers and trained facilitators subsequently formed small groups, which worked through exercises that reinforced the concepts learned in the large group. Individual, remedial instruction was given by the senior trainers to certain interviewers whose understanding of the work appeared inferior to that of the group. In the final small-group session, each interviewer took an open-book quiz, which was reviewed immediately thereafter.

In January 1994, a special, two-day version of the three-day training was held in Atlanta, Georgia, to train additional interviewers. Since only 11 interviewers attended, all training was done in a small group. Four interviewers who could not attend any of the regional trainings were trained on the telephone.

The first two RECS interviews completed by each interviewer were reviewed by the contractor's staff. Extensive written feedback was given to each interviewer and additional telephone training was provided when warranted.

The Interviewers

A total of 234 interviewers completed one or more personal interviews for this study. Eighty-three interviewers (35 percent) had completed interviews on a prior RECS. The remainder were conducting their first RECS but had interviewing experience either with other survey research organizations or with the U.S. Bureau of the Census.

Interviewers were paid on an hourly basis for their work on RECS, which included time for home study, review of completed interviews, actual interviewing time, and travel to and from sampled housing units. The use of personal vehicles and other travel expenses were reimbursed at standard mileage rates. Interviewers working in locations believed to present a hazard to their safety were compensated for the use of an escort.

Interviewers conducted an average of 30 interviews. Twenty-six interviewers completed fewer than six interviews each, with an average of 3 per interviewer. Thirty-seven interviewers completed 50 or more interviews each, with an average of 82 per interviewer. Twenty percent of the personal interviews were verified by telephone or mail to ensure that interviews were conducted as intended.

Data Collection Procedures

In an effort to minimize nonresponse and, thereby, maximize the validity of the survey data, a multiwave, multicontact approach was employed. Before the initial contacts, a letter was sent to each household with a street address. The letter, from the Director of the Office of Energy Markets and End Use, briefly described the purposes and stressed the importance of the survey. Beginning in October 1993, interviewers made up to seven or more callbacks at different times of the day, throughout the week, in an effort to minimize the number of uncontacted households. The interviewers also queried neighbors regarding the most opportune times to contact the prospective respondent. By the end of the first wave, it was apparent that 198 addresses were nonresidential and an additional 829 were ineligible (Table A4). Some 5,434 personal interviews were completed, leaving 3,408 nonrespondents in this wave.

A second wave was initiated in an effort to contact households that were not available during the first wave and to attempt to convince selected first-wave refusals to reconsider. A new set of letters preceded the renewed effort and, in most cases, the sampled housing units were assigned to a different interviewer. Again, up to seven or more attempts were made to contact the prospective respondents. At the end of this wave, an additional 70 addresses were found to be ineligible. As a result of the second wave, an additional 1,104 interviews were completed, leaving 1,940 nonrespondents.

A third wave was initiated in an effort to reach nonrespondents in a number of locations that had low completion rates. Nineteen addresses were found to be ineligible and an additional 380 personal interviews were completed in the third wave.

Next, telephone interviewers attempted to contact households where a personal interview was not completed and for whom we already had or were able to acquire a telephone number (using a CD-ROM-based reverse directory). The telephone questionnaire, an adapted version of the mail questionnaire for use on the phones, was administered to respondents via computer-assisted telephone interviewing (CATI). Interviews were completed with 78, or 10 percent, of the 786 households eligible for this phase of data collection.

These households were mailed Authorization Forms and asked to sign and return them (a telephone interview was counted as complete only if the signed Authorization Form was returned by the household). The form was accompanied by letters from the Director of Energy Markets and End Use and the survey contractor's Project Director stressing the importance of the research and asking for their cooperation. Interim reminder calls were made to households who hadn't returned their signed forms.

A special effort was made to increase the number of signed Authorization Forms which had not been signed at the time of the personal interview. A Form was mailed to these households with a request to sign the form. Seventy-four, or 38 percent, of the 196 Authorization Forms were returned (one household was dropped because they completed a personal interview after the telephone contact). Four other (of the 196) households did not pay for their fuels; since an authorization form was not required, these were also considered complete. A total of 78 additional interviews were generated from this effort.

Table A4. Interviews Completed by Stage in the 1993 RECS

Units	Personal Interviews Attempted			Status After Third Wave	Status After Telephone Followup	Status After Mail Followup	Final Status
	First Wave	Second Wave	Third Wave				
Total Listed Units	9,869	3,114	1,282	9,869	786	1,528	9,869
Out of Scope Units							
Business, Other	67	0	0	67	--	--	67
Hot Habitable	42	0	0	42	--	--	42
Nonhousing Unit	89	0	0	89	--	--	89
Subtotal Out of Scope	198	0	0	198	--	--	198
Housing Units	9,671	3,114	1,282	9,671	786	1,528	9,671
Ineligible Units							
Vacant	664	42	6	712	--	--	712
Seasonally Vacant	165	28	13	206	--	--	206
Subtotal Ineligible	829	70	19	918	--	--	918
Eligible Units (or number contacted)	8,842	3,044	1,263	8,753	786	1,528	8,753
Not Completed							
No One Home	1,177	657	339	233	--	--	196
Eligible Respondent Not Home	117	76	22	45	--	--	38
Refused	1,741	926	423	1,335	--	--	1,201
Illness	58	28	9	37	--	--	31
Language Barrier	92	26	4	40	--	--	39
Wrong Respondent or Unit	17	9	5	11	--	--	11
Prohibited Access (Code 77)[2]	60	111	32	17	--	--	17
Other	146	107	49	117	--	--	109
Subtotal Not Completed	3,408	1,940	883	1,835	--	--	1,642
Total Interviews Completed	5,434	1,104	380	6,918	78	115	7,111

[1]A household that refused an interview during any one of the three waves was classified as a "refusal" for the status after the third wave, even though no one was at home in the second or third wave.

[2]Includes households that moved after initial contact.

-- Data not applicable.

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-B of the 1993 Residential Energy Consumption Survey (RECS). RECS Public Use Data Files and unreleased data.

In a final attempt to reduce nonresponse, an abbreviated version of the questionnaire (adapted for self-administration) was mailed to most of the remaining nonrespondents. As a result of this effort, 115 additional households responded. After three waves of personal interview attempts, a telephone contact, and the mailed questionnaire, 1,642 households or 18.8 percent of all eligible housing units had not responded.

These efforts were successful in accomplishing the following improvements in response.

- Approximately 79 percent of the households were contacted and agreed to be interviewed personally. Roughly 1 percent of households granted a telephone interview and satisfied the Authorization Form requirement. An additional 1 percent of the sampled households completed and returned mailed questionnaires.

- Of the 7,111 responses, 76.4 percent were obtained during the first wave of contacts; 15.5 percent were obtained during the second wave; and 5.3 percent resulted from third-wave contacts. Some 1.1 percent responded to the telephone followup and 1.6 percent responded to the mailed questionnaire.

- Of all households that participated in the personal interviews, 24.2 percent required only one visit in the first wave, and 60.6 percent were completed with no more than two first-wave callbacks.

- In the second and third waves, a total of 406 personal interviews (representing 5.9 percent of all completed personal interviews) were conducted with respondents who had previously refused to participate. Sixty-one households who refused to participate in a personal interview did complete a telephone interview and returned the signed Authorization Form. These households represent 78.2 percent of all completed telephone interviews.

In addition, of the 115 mailed questionnaires that were completed and returned, 73 were from households that refused to participate in person.

Of special concern during the fieldwork was the prevalence of sample units where access was prohibited primarily because of security measures. Special efforts to contact officials charged with the security reduced the number of households we could not contact to 17, down from a high of 111 households at the end of the second wave (Table A4). Households with prohibited access constituted a very small part of the total 1,642 households where we could not complete an interview.

Response Rates and Household Characteristics

This section of the report compares various response and nonresponse rates across Census region, urban status, and housing structure type (Table A5). As evident in this table, personal interviewers were most successful in the South (81.0 percent) and the Midwest (80.4 percent), in rural areas (84.2 percent), and in single family and mobile homes (79.6 percent). Conversely, the interviewers had their lowest success rates in the Northeast (75.8 percent), in urban and suburban areas (77.6 percent), and in buildings with two to four residential units (74.7 percent). When comparing these groups, it is important to remember that their characteristics are not necessarily independent. For example, apartment buildings are concentrated in urban areas.

Table A5. Response Rates in the 1993 RECS by Region, Urban Status and Type of Structure
(Percentage of Eligible Housing Units)

	Response Rates[1]					Personal Interview Nonresponse Rates	
	Personal	Followup Efforts			Total		
Housing Characteristics	Interviews	Telephone	Mail	Total	Responses	Refusals	Unable to Contact
Total	79.0	0.9	1.3	2.2	81.2	15.3	5.7
Census Region							
Northeast	75.8	1.0	1.5	2.6	78.3	16.6	7.7
Midwest	80.4	1.5	1.4	2.9	83.3	15.5	4.1
South	81.0	0.7	1.1	1.8	82.8	13.8	5.2
West	77.9	0.5	1.4	1.9	79.8	16.0	6.1
Urban Status							
Urban (Central City)	77.6	0.6	1.1	1.7	79.4	15.5	6.8
Suburban	77.6	1.1	1.9	2.9	80.5	17.1	5.4
Rural	84.2	0.9	0.6	1.5	95.7	11.1	4.7
Structure Type							
Single-Family or Mobile Home	79.6	1.0	1.3	2.3	81.9	15.8	4.6
Buildings with Two to Four Units	74.7	1.1	1.4	2.5	77.1	17.0	8.4
Buildings with Five or More Units	78.6	0.3	1.3	1.7	80.2	12.0	9.4

[1]As a percent of the total eligible number of housing units.
Note: Because of rounding, data may not sum to totals.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-B of the 1993 Residential Energy Consumption Survey (RECS). RECS Public Use Data Files and unreleased data.

Data Editing

Completed interviews were mailed by the interviewers to the survey contractor headquarters. The first step in the review process was to verify the accuracy of the basic identifying information. Second, the questionnaires were manually reviewed to ensure completeness and logical consistency of selected patterns of responses. Third, the questionnaires were prepared for translation into machine-readable form. Keying of the data was 100 percent verified. Finally, the data were machine-edited to further ensure completeness, logical consistency, and the legitimacy of coded values.

The contractor attempted to resolve inconsistencies or ambiguities in the data internally, by referencing other parts of the questionnaire. When these efforts failed to resolve an important problem, particularly those involving heating fuels or heating equipment and/or relationships between questionnaire responses, the contractor made a followup contact with the rental agent or made a telephone contact with a member of the household in question.

The total response-rate patterns generally were not affected by including the mailed-questionnaire responses and telephone interviews. However, response rates for the mail and telephone efforts tended to be highest where the refusal rate to the personal interview was highest.

Adjusting for Nonresponse

The two major types of nonresponse are unit nonresponse and item nonresponse. Unit nonresponse occurs when a sampled household does not participate in the survey. Item nonresponse occurs when a particular item of interest is missing from a completed questionnaire. With both types of nonresponse, the missing data must be imputed. The next two sections provide details on the procedures followed for each type of imputation. A third section deals with a special category of item nonresponse--the size of housing units in square feet.

Unit Nonresponse

Weight adjustment was used to reduce unit nonresponse bias in the survey statistics. Weights were calculated for each sample household. The household weight reflected the selection probability for that household and additional adjustments. These adjustments included correcting for potential biases arising from the failure to list all housing units in the sample area and failure to contact all sample housing units. Contacts were not successful with 18.8 percent of the eligible units.

The adjustment for these noninterviews (i.e., unit nonresponse) was designed to spread the effects of nonresponse over the subset of interviewed households sharing similar characteristics. Clusters of noninterview adjustment cells were formed according to the following sequence:

- Geographic domains: Clusters of PSU's in the major geographic domains used in the sample stratification. These clusters included the nine Census divisions, Alaska, Hawaii, and the self-representing PSU's (i.e., the large metropolitan areas) in the four largest Census divisions.

- Weighting classes: These are based on the differential sampling of low-income households and newly constructed housing units. For low-income households, clusters of SSU's were oversampled based on income and the type of home-heating fuel. Weight classes for newly constructed housing units were determined by interviewers' estimates (made at the time of field listings) of the date of construction of each housing unit. Also, separate clusters were created for subsampling in large segments.

- Climate zones: Geographic areas based on county-level long-term heating and cooling degree-day averages.

- Housing unit type: Single-family, detached or attached; multifamily, two to four units or five or more units.

A large number of weight-adjustment cells were formed by the cross-tabulation of the characteristics listed above. In general, the noninterview weight was equal to the total number of households in the weight adjustment cell (interviews plus noninterviews) divided by the number of interviews. However, when this weight adjustment was greater than 2.0, cells were collapsed until the noninterview weight was reduced to 2.0 or below. Cells were collapsed, as necessary, in the reverse order of the listing of characteristics above. Housing unit types were collapsed first, followed, if necessary, by climate zones, and so on.

The failure to list all housing units in the field-listing task is a common problem in surveys of this type. The result is an undercount of housing units in the sample area and, hence, an underestimate of the number of households in the universe. The undercount in the 1993 RECS was in the range of 4 to 5 percent. This problem was treated in two ways in the RECS. One treatment occurred during the interviewing process. The second treatment occurred in the estimation process. During the interviewing stage, unlisted housing units or households were discovered by querying the responding household to determine if other households were present in the unit. In addition, the interviewer was instructed to conduct an interview at all housing units contained in the geographical area between the interviewed household and the next listed address. This method reduced the number of missed households, but did not completely eliminate the noncoverage problem.

The noncoverage problem was also treated by using ratio estimation to adjust selected estimates of household counts to official population values. Ratio adjustment took place in five stages for the 1993 RECS.

First Stage. The first-stage adjustment was computed from Census information for PSU's in NSR strata only. The purpose of this adjustment was to reduce the contribution of the variance arising from the sampling of PSU's. A separate factor was created for each of 36 cells (four Census regions classified by 9 space-heating fuel categories). The factors varied from 1.1688 for natural gas in the Northeast to 0.7897 for liquefied petroleum gas in the Midwest. The implementation of this factor reduced somewhat the amount of variance caused by the sampling of PSU's. The first-stage adjustment for Cell c is given by:

$$R_{1c} = N_c / M_c \quad \textbf{(3)}$$

Where N_c is the total number of households (1990 Census population) in Cell c for all PSU's in RECS NSR strata (including those PSU's not selected for RECS). M_c is an estimate of N_c obtained from the 1990 Census data for the NSR PSU's that were selected for the 1993 RECS. In particular, M_c is given by the sum (over all NSR PSU's selected for RECS) of the product of the PSU sampling weight and the number of households in Cell c (1990 Census population) for the selected PSU's.

For all observations in NSR PSU's, the household's weights were multiplied by R_{1c} where c is the cell in which the observation falls.

Second Stage. The second-stage factor adjusted the weights from the survey so that the sum of the weights in the 13 Division-State categories shown in Table A6 were equal to the CPS estimates for the population in the 13 categories. The second-stage adjustment for Category k is given by:

$$R_{2k} = H_k / G_k \quad \textbf{(4)}$$

Where H_k is the CPS estimate of the number of households in Category k, and G_k is the sum of the RECS households' weights before the second-stage ratio adjustment over all households in Category k. H_k is the July 1993 value for each of the 13 cells, based on a linear extrapolation from the March 1992 and March 1993 CPS estimates.

For all observations in Category k, the households' weights were multiplied by R_{2k}. This second-stage factor reduced the between-PSU variance.

Third Stage. The third stage in the weight adjustments was similar to the second stage. The only difference was that, instead of the 13 categories used in the second stage, the following 12 combinations of MSA status and Census region were used:

MSA Status	Census Region
Central City of MSA	Northeast
Central City of MSA	Midwest
Central City of MSA	South
Central City of MSA	West
Balance of MSA	Northeast
Balance of MSA	Midwest
Balance of MSA	South
Balance of MSA	West
NonMSA	Northeast
NonMSA	Midwest
NonMSA	South
NonMSA	West

This third-stage factor reduced both the between-PSU variance and the within-PSU variance.

Fourth Stage. The fourth stage in the weight adjustments was similar to the second stage. The only difference was that, instead of the 13 categories used in the second stage, the following three categories were used:

1. One-person households, male householder,
2. One-person households, female householder,
3. All other households.

The purpose of this fourth stage was to reduce possible bias in the RECS sample due to undercoverage of one-person households, particularly those comprised of a single male.

Fifth Stage. The fifth and final stage in the weight adjustments was exactly like the second stage. The final household weights will (for each of the categories in Table A6) sum to control totals shown in that table.

Table A6. U.S. Population Estimates Used as Controls in Ratio Adjustment of Sampling in the 1993 RECS

	Thousands of Households
New England	5,067
Middle Atlantic (minus New York State)	7,607
East North Central	16,352
West North Central	6,949
South Atlantic (minus Florida)	11,793
East South Central	6,002
West South Central (minus Texas)	3,682
Mountain	5,359
Pacific (minus California)	3,870
New York	6,803
Florida	5,574
Texas	6,447
California	11,125
Total United States	**96,631**

Note: Because of rounding, numbers do not sum to the U.S. total.
Source: Linear extrapolation from U.S. Bureau of the Census, Current Population Survey, March 1992 and March 1993.

Item Nonresponse

Item nonresponse occurs when respondents do not know the answer or refuse to answer a question or when an interviewer does not ask a question or does not record an answer. Imputations were made for nonresponse on about two-thirds of the nonresponse items.

"Hot-deck" imputation was the method used most frequently (Table A7). The hot-deck procedure requires sorting the file of households by variables related to the missing item. A household is then selected that has the same value for the related variables, and this "donor" household supplies the value for the variable that is missing in the "donee" household.

Table A7. Imputation Methods Used for the 1993 RECS Household Questionnaire

Imputation Method	Questionnaire Items Subject to Imputation	
	Number	Percent
Not Imputed	181	32
Imputed	378	68
Hot-Deck	287	51
Random	39	7
Deductive	17	3
Allocation	35	6
Total Items*	559	100

*There are an additional 43 questionnaire items for which there were no missing values or for which values were determined by explicit editing rules in the initial stages of questionnaire editing.
Source: Energy Information Administration, Office of Energy Markets and End Use, Form EIA-457A of the 1993 Residential Energy Consumption Survey (RECS). RECS Public Use Data Files.

Less frequently used imputation methods included random selection from the known values of a variable and deductive and allocation procedures.

The random-selection procedure was used primarily to impute for continuous numerical values and missing numbers that were conditional on other numbers (e.g., number of storm windows is conditional on total number of windows).

Deductive procedures were used primarily for missing information on fuels used for specific purposes and on methods of payment for fuels. The amount of missing data on these items was generally quite small. Other information available from the questionnaire or from related data sources (utility bills and rental agent survey) provided reasonably accurate assignments for the missing data.

Allocation procedures use explicit rules for assigning values to missing information about a household member's age, sex, or relationship to the householder. The procedures are based on the configuration of known information on these variables for other household members.

The most frequently imputed items may be more prone to imputation error (Table A8). The amount of item imputations for the 193 households receiving telephone interviews or mail questionnaires was considerable, since these questionnaires contained only a small subset of questions from the household interview. For the telephone and mail questionnaires, a modified hot-deck imputation method was used. A hot-deck matrix was created for phone/mail questionnaires and personal-interview households by using Census region, type of housing unit structure, space-heating fuel, hot-water fuel, and presence and type of air-conditioning. Whenever possible, a donor personal-interview household was chosen for each phone or mail questionnaire household from the same cell of the hot-deck matrix. For 99 percent of the phone/mail questionnaires, donors matched on all hot-deck variables.

Table A8. Household Questionnaire Items Most Frequently Imputed in the 1993 RECS

Imputed Item	Cases Imputed	Percentage of Total Sample[1] (6,918)	Method of Imputing	Question Number on Questionnaire
Income in past 12 months	818	12	Hot deck	L-10
Number of windows replaced	815	12	Hot deck	H-12
DSM program participation	655	9	Hot deck	I-2
Regular maintenance of heating system	440	6	Hot deck	H-3 b
Availability of natural gas	430	6	Special/Hot deck	B-12
Year building constructed	392	6	Hot deck	B-7
Type of defrosting of separate freezer	388	6	Hot deck	G-12 c
Use of whole house cooling fan	379	5	Hot deck	H-15 d
Use of attic exhaust fan	377	5	Hot deck	H-15 c
Amount of heat from main equipment	356	5	Hot deck	C-5
Use of ceiling fan	353	5	Hot deck	H-15 e
Use of window fan	351	5	Hot deck	H-15 a
Portion of house cooled by air-conditioning	343	5	Hot deck	D-2
Use of portable fan	339	5	Hot deck	H-15 b
Size of separate freezer	323	5	Hot deck	G-10 c
Age of separate freezer	299	4	Hot deck	G-9 c
Type of basement or foundation	294	4	Hot deck	O-2
Years expects to remain in home	277	4	Hot deck	O-5
Water heater size	264	4	Hot deck	E-3
Age of replacement windows	262	4	Hot deck	H-14
Floor insulation	247	4	Hot deck	O-4
Quality of home's insulation	223	3	Hot deck	H-1
Use of central air-conditioning	222	3	Hot deck	D-4
Home is part of condominium	219	3	Hot deck	B-4
Knowledge of energy assistance programs	219	3	Hot deck	M-2
Government help weatherizing	213	3	Hot deck	M-1

[1]Mail questionnaires and telephone interviews are not included in the percentage. To account for these, add three percentage points to the percentage points given.

Source: Energy Information Administration, Office of Energy Markets and End Use, Form EIA-457 A of the 1993 Residential Energy Consumption Survey (RECS). RECS Public Use Data Files.

Because each cell of the matrix usually contained several possible donors, a donor was chosen from the cell on the basis of how closely it matched the phone/mail questionnaire household on a number of additional variables. These variables were income, number of household members, number of household vehicles, age of householder, tenure, number of rooms, model year of newest vehicle, and household structure (married couple, other). Except for information on household vehicles, which was taken directly from the phone/mail questionnaire, the entire set of responses from the donor household was imputed to the phone/mail questionnaire household. This means that all responses for phone/mail questionnaire households are imputed except for the following: weather/climate data, fuel-consumption data acquired from the household's energy suppliers, the geographic location of the phone/mail questionnaire household, information about household vehicles, and those items in the hot-deck imputation process for which an exact match was obtained.

Rental-Agent Survey

The Rental-Agent Survey is an adjunct to the Household Survey and is used to verify information furnished by certain RECS households on fuels used, main heating equipment, how fuels are paid for, and other energy-related topics. Telephone interviews were conducted by using Form EIA-457C, "Rental Agents, Landlords, and Apartment Managers Telephone Survey," with the rental agents and landlords of the following types of RECS households: households that did not pay for their fuels, households who paid a third party for their fuel and who rent their living quarters or own and occupy living quarters in a multi-unit building. The interviews with rentals agents or their representatives were conducted in early Summer 1994. Altogether, 285 landlords or rental agents were interviewed; these interviews encompassed 625 households in 326 buildings. The 625 households represented 81.8 percent of the 764 total households who were eligible for inclusion in the rental agent survey.

Comparisons were made between rental agents' and household respondents' reports on their buildings' year of construction; main space-heating and water-heating fuels; main space-heating equipment; fuel for cooking range; central air-conditioning information; and how the fuels for all of these uses are paid for. Each discrepancy was examined and changes were made to the household data whenever it was judged that the rental agent was more knowledgeable than the household respondent on the different items of information.

Generally, the person who paid for a specific fuel for a specific use was deemed the more knowledgeable person. However, error resolutions were made only after careful examination and consideration of all available sources of information, including the rental-agent questionnaire, the household questionnaire, utility-survey data, and questionnaires of other households located in the same building. Landlords and rental agents were usually judged more knowledgeable about the year the building was built and the type of main heating equipment; household respondents were typically deemed more reliable sources concerning central air-conditioning and fuel for the cooking range.

Energy Supplier Survey

The overall objective of the energy supplier survey was to provide data to estimate the annual energy consumption and expenditures of sample households. Five energy sources were covered in the supplier survey--electricity, natural gas, fuel oil, kerosene, and LPG.[27] For each of the energy sources, the goal was to obtain complete consumption records from January 1, 1993, through December 31, 1993.

Toward the end of the household interview, each household reported for each use of the energy source whether or not it was paid for by the household, included in rent, or paid another way. For the households that paid directly, the respondent was asked for the names, addresses, and telephone numbers of the energy suppliers; these respondents were also asked to sign a form, authorizing the contractor to collect consumption data from the suppliers. Altogether, the energy supplier survey included initial contact attempts with 972 companies (Table A9).

[27] Households using LPG only for outdoor cooking grills were not included in the LPG data collection; LPG used by these households is excluded from consumption and expenditures estimates. Data on usage of wood fuel were reported by the household, since it was not practical to collect these data from suppliers as is done with the major home fuels. Unless otherwise noted, consumption of wood is not included in the tables for this report.

Table A9. Companies in the Energy Supplier Survey and Number of Households Supplied in the 1993 RECS

Energy Supplier	Number of Companies[a]	Number of Households with Companies Identified
Electricity	201	6,752
Natural Gas (includes some also supplying electricity or LPG)	145	3,497
Fuel Oil or Kerosene[b]	375	992
LPG (includes some also supplying fuel oil or kerosene)	251	666

[a]The total number of companies in the survey was 972; 41 supplied both electricity and natural gas; 2 supplied natural gas and LPG; and 36 supplied fuel oil or kerosene and LPG.

[b]Households were asked for names of their "fuel-oil or kerosene" suppliers. Since most companies who have supplier records furnish both types and often supply both types of fuel to the same household, these companies are reported together. If a respondent reported only "cash and carry" purchases of a bulk fuel (fuel oil, LPG, or kerosene), they were not asked to furnish the name of the supplier.

Source: Energy Information Administration, Forms EIA-457A-G of the 1993 Residential Energy Consumption Survey (RECS). RECS Public Use Data Files.

Data-Collection Procedures

Data-collection procedures for electricity and natural gas companies included at least the following steps:

- An initial letter from the Director of the Office of Energy Markets and End Use, addressed to the president or other official in the company, outlining the general nature of the request for participation. Enclosures in the letter included a printed statement, "About the Residential Energy Consumption Survey," specimen copies of reporting and authorization forms, and a postage-paid postcard with a checklist of available publications and data tapes. Publications that were checked on the postcard were sent to the energy supplier.
- A telephone contact to determine the name of the person to whose attention the survey materials should be sent.
- The mailing of survey materials to the person named as contact person.
- A follow-up telephone contact a few days later to answer questions or discuss survey procedures as necessary.
- Completed forms or copies of records returned by mail.
- A letter from the survey contractor thanking the company for its effort.

The personal contacts established at an early point largely precluded mailings of materials to an inappropriate person and the delays that might develop from such mailings.

Procedures for fuel oil or kerosene and LPG suppliers were the same as for electric and natural gas suppliers up through and including the mailing of survey materials to the company person named as the contact. These suppliers, however, most often had only one or two households for which information was to be supplied, and data collection was generally completed by telephone. A pretest of the procedure conducted earlier had indicated a somewhat greater likelihood that suppliers would respond by telephone than as a result of a request to complete and return the forms by mail.[28]

After the supplier returned the information, additional contact with the suppliers and the households was sometimes required to identify the correct record in the company files.

Data-Collection Dates

The first set of advance letters was mailed to the energy suppliers in March 1994. The cutoff date for receipt of usable information was September 30, 1994. The last data were received in October 1994 and were used.

[28]The test is described in *RECS: Consumption and Expenditures--April 1980 Through March 1981, Part 1: National Data,* DOE/EIA-0321/1 (Washington, DC, September 1982), Appendix A, "How the Survey Was Conducted." Suppliers that chose to return the forms by mail, however, were not discouraged from doing so.

Data Processing

The energy consumption and expenditure statistics presented in this report are based on the individual annual consumption and expenditures amounts for each household. Individual consumption and expenditure amounts are calculated for each household for each of five energy sources (electricity, natural gas, fuel oil, kerosene, and LPG). None of the households that participated in the 1993 RECS used all five energy sources, but the majority of the households did use two or more energy sources. When possible, the annual consumption and expenditure amounts were calculated by using data obtained from the Energy Supplier Survey.

The Energy Supplier Survey was conducted for households that paid their own fuel bills directly to the supplier and signed a form to authorize access to their billing records. These limitations meant that imputations of fuel consumption and expenditures were required for households whose fuel bills were included in the rent and for households that did not permit access to their records.

Imputations were also required for households when the supplier failed to produce usable billing records. The billing records for a given fuel and a given household were considered missing (and hence nonusable) if: (1) the supplier refused to participate, (2) the supplier did not keep records, (3) the supplier could not find the householder's records, (4) the information provided by the household was insufficient to locate the supplier, or (5) the supplier was no longer in business.

Available but nonusable billing records occurred when: (1) the household recently moved into the dwelling unit; (2) the amount of the bill that could be attributed to the housing unit was unknown; or (3) the billing records did not cover the entire amount used by the household.

For cash-and-carry purchases, households were asked to provide estimates of consumption and expenditures for kerosene only. In addition, if the household indicated that it had the ability to use LPG, fuel oil, or kerosene but yet planned no purchases during 1993, they were assigned a consumption of zero. See "Annual Consumption and Expenditures" in Appendix B, "Quality of the Data," for more details on the annualization of monthly billing records and imputations for the energy supplier data.

Weather and Price Data

Weather and price data were added to the household data file. The weather data were taken from National Oceanic and Atmospheric Administration weather station data files of daily minimum and maximum temperatures for 1993. Weather stations were selected on the basis of their proximity and appropriateness in representing the weather experienced by sample households in the secondary sampling unit. In selecting an appropriate, nearby weather station, distance was the major consideration but intervening mountain ranges and the presence of bodies of water were taken into account. Every household record contains weather data, whether or not the household did any space heating or air-conditioning.

For each household that used electricity (99.9 percent), the cost of 1,000 kWh reported by the household's electricity supplier on Form EIA-861 was added to the household record. For each household that used natural gas (60.7 percent), the cost of 1,000 cubic feet of natural gas reported by the household's natural gas supplier on Form EIA-176 was added to the household record. In those cases when the energy source was included in the rent and the household may not have known the supplier for the building, the rental agent was asked for the supplier, so the appropriate supplier cost data could be attached to the household record.

Special Data Collection for the Administration for Children and Families

The EIA collects supplemental data during the RECS interview for the Administration for Children and Families (ACF) for their use in program administration of the Low Income Home Energy Assistance Program (LIHEAP). In the 1993 RECS, most of this information was in Section M of the Household Questionnaire (Form EIA-457A). Respondents with annual incomes and number of household members that might qualify them for assistance were asked a series of questions about the receipt of home energy assistance and lack of heat during the previous winter.

RECS also supported the LIHEAP through an ACF-funded oversampling of low income homes (See Tables A1 and A2 for details). An annual report to Congress is produced by the LIHEAP which contains data from the RECS.

Confidentiality of Information

The EIA does not receive nor take possession of the names or addresses of individual respondents or any other individually identifiable energy data that could be specifically linked with a household respondent. All names and addresses and identifiable information are maintained by the survey contractor for verification purposes only. The household records that are placed on the public use data file do not have name or address information. Additional measures have been taken to mask the data for further confidentiality protection. Unlike other EIA surveys, the consumption surveys pledge confidentiality to their respondents.

Public-Use Data File Preparation

Household Energy Consumption and Expenditures 1993 was produced with the survey data file received in April 1995. A final data file containing both the housing characteristics and energy supply data for the 1993 RECS is available. Geographic identifiers other than the Census region and Census division were removed from the data to insure that the identity of the individual respondents is kept confidential.

The public-use data are available through the National Technical Information Service (NTIS) and the Office of Scientific and Technical Information (OSTI) at Oak Ridge National Laboratory. (See Appendix F for information on how to order this data file from NTIS or OSTI.) The file is available on floppy diskettes for use with personal computers.

Appendix B

Quality of the Data

Appendix B

Quality of the Data

Introduction

All the statistics published in this report are estimates of population values, such as the total amount of natural gas consumed in housing units that use natural gas. These estimates are based on observations from a randomly chosen subset of the entire population of occupied housing units. As a result, the estimates can differ from the true population values. This appendix deals with the nonsampling and sampling errors and other related factors affecting the quality of the data. The three main sections of this appendix are: Nonsampling Error, Annual Consumption and Expenditures, and Estimation of Sampling Error.

The differences between the estimated values and the actual population values are of two types, sampling errors and nonsampling errors. Nonsampling errors are also known as systematic errors or biases, and are presented in the section "Nonsampling Error."

In addition, response adjustments and ratio estimations were incorporated into the survey estimator to help reduce both sampling and nonsampling error. Nonresponse (both unit and item) adjustment procedures for the Household Survey are discussed in Appendix A, "How the Survey Was Conducted," in the section entitled "Adjustments for Nonresponse." Procedures for adjusting the billing data collected in the Energy Supplier Survey are discussed in the "Annual Consumption and Expenditures" section of this appendix.

Unlike the magnitude of the sampling error, the magnitude of the nonsampling error cannot be estimated from the sample data. For this reason, avoiding biases and systematic errors at the outset is a primary objective of all stages of survey design and field procedures. The wording and format of survey questionnaires; the procedures used to select and train interviewers; and the quality control built into the data collection, receipt, and processing operations were all designed to minimize these sources of error. For a discussion of these procedures, see Appendix A, "How the Survey Was Conducted."

Sampling error is the random difference between a survey estimate and a population value that occurs because the survey estimate is calculated from a randomly chosen subset of the entire population. The section "Estimation of Sampling Error" in this appendix describes how the sampling error is estimated and presented for statistics given in this report.

A report summarizing all the information that has been accumulated about the quality of the RECS data will be available in early 1996. The report, *Quality Profile of the Residential Energy Consumption Survey*, will cover the RECS data series beginning with the 1980 RECS.

Nonsampling Error

Nonsampling errors can occur for the following reasons:

- Differences between the target population (residential sector) and the population from which the sample is selected (occupied primary residential housing units)
- Interviewer errors, respondent misunderstandings, questionnaire-design errors, and data-processing errors
- Systematic nonresponse for certain segments of the population (unit nonresponse)
- Nonresponse on certain questions from the questionnaire for some respondents (item nonresponse).

The segments "Completeness of Data" and "Quality of Specific Data Items" describe some of the sources of nonsampling error and how the survey is designed and conducted to minimize such errors. "Completeness of Data," describes the nonsampling errors that occur for the first reason in the list above.

"Quality of Specific Data Items" discusses the derivation of some statistical data and reviews some of the nonsampling errors that occur for the second, third, and fourth reasons in the list above. These errors would be expected to occur even if the survey attempted to contact the occupants of every occupied housing unit in the country. (For example, the results of the Decennial Census conducted by the Bureau of the Census are subject to these nonsampling errors.)

Completeness of Data: Noncovered Housing Units

Data are not collected for the following two types of housing units:

- **Vacant housing units**. These units may use energy for minimal heating for protection from the weather and minimal lighting for security. The American Housing Survey (AHS) conducted by the Bureau of the Census estimated that there were 6.4 million vacant, year-round housing units (that were not held for "occasional" use) in 1993.

- **Seasonal units or second homes for the owner's use**. The AHS estimates there were 2.5 million year-round homes held for "occasional" use and 3.1 million "seasonal" units in 1993.

These two types of units are not included in the RECS primarily because of the difficulty in acquiring data and limitations in the availability of funds for the RECS. The RECS data are collected by interviewing an occupant of the housing unit. By definition, a vacant housing unit is not occupied at the time RECS field workers attempt to interview the occupants of the unit. Hence, for vacant units, someone other than the occupants would need to be contacted. For many vacant units, this would add substantially to the cost of acquiring data for the unit. By definition, second homes are housing units that are not the primary residence of the occupants. Hence, for many second homes, the occupants may be living somewhere else at the time the interviewers are in the neighborhood of these second homes. As a result, contacting and interviewing the occupants of second homes may be costly and difficult.

Some effects of these omissions are an underestimation of the total number of residential housing units, the number of units in subcategories, and the amount of energy consumed in the residential sector.

Quality of Specific Data Items

Demand-Side Management Program Availability and Participation

In the 1993 RECS, questions about the availability of and participation in Demand-Side Management (DSM) programs were asked during the household interviews and in the energy suppliers' survey. The range of response choices to the household interview included DSM programs that were sponsored by either an electricity or natural gas utility or by a third party, such as an energy-service company or contractor. DSM participation as reported by the household meant that the household participated in at least one of these programs in the past 12 months. As reported by the electricity or natural gas supplier, DSM participation meant that the household participated in a least one type of DSM program during calendar year 1993. In general, the household and supplier reports were inconsistent regarding both availability and participation in programs.

Availability of DSM Programs. A comparison of responses from the household interviews and those provided by their electric and natural gas suppliers revealed substantial disagreement as to the availability of DSM programs. Among all the households interviewed, 36.1 percent reported that at least one type of DSM program was offered to them by their electric utility, natural gas utility, or some other group. By contrast, 80.6 percent of the suppliers providing electricity to these same households reported that they offered some type of DSM program. Of the 41.4 percent of households who reported that no DSM program was available to them, over three-quarters (77.7 percent) of their electric suppliers reported that a program was available.

Among the households using natural gas, 35.3 percent reported that at least one type of DSM program was available to them. In contrast, 57.1 percent of the suppliers of natural gas to these same households reported that some type of program was available. Of the 40.2 percent of households using natural gas who reported that no DSM program was available to them, more than half (53.0 percent) of their natural gas suppliers reported that a program was indeed available to them.

Participation in DSM Programs. There was also a high level of disagreement between suppliers and the household reports as to participation in electric utility DSM programs. As shown in Table B1, of the 9.0 percent of all households who the supplier reported as participants, 59.2 percent reported in the interview that they had not participated. Of the 7.5 percent of all households that reported that they participated, 33.0 percent were reported by their electric supplier as non-participants.

Table B1. Participation in Electric DSM Programs
(Percent of Households Using Electricity)

	Participation According to Supplier Survey			
	Yes	No	Not Ascertained	Total
Participation According to Household Interview				
Yes	3.7	2.5	1.3	7.5
No	5.3	54.0	33.1	92.5
Total	90	56.5	34.5	100.0

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A and E of the 1993 Residential Energy Consumption Survey.

The high level of disagreement between suppliers and the household on participation also characterized natural gas DSM programs. As shown in Table B2, of the 1.6 percent of all households who were reported as participants by suppliers, 79.7 percent reported in the interview that they had not participated. Of the 2.8 percent of all households that reported that they had participated, 58.9 percent were reported by their natural gas supplier as non-participants.

Table B2. Participation in Natural Gas DSM Programs
(Percent of Households Using Natural Gas)

	Participation According to Supplier Survey			
	Yes	No	Not Ascertained	Total
Participation According to Household Interview				
Yes	0.3	1.6	0.8	2.8
No	1.3	56.3	39.7	97.2
Total	1.6	57.9	40.5	100.0

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A and F of the 1993 Residential Energy Consumption Survey.

Estimates of Window Stock and Window Area

Respondents to the 1993 RECS were asked to report the number of windows in their home (Question H-8). Each window that opened separately was counted as one window. Also counted were windows fixed in place, e.g., picture windows. Basement, attic, garage, and porch windows were included only if they were located in heated areas of the home. The estimate of total windows in the United States was a weighted total of the responses to this question.

The respondent was asked to select one description for most of the windows in their home (Question H-9). We did not ask for a description of each window in the home. Therefore, in order to estimate the number of windows of a particular description, we had to assume that every window in a given home was of the description reported in Question H-9.

The estimate of the number of windows that had been replaced was based on the question that asked whether all, some, or none of the original windows had been replaced (Question H-12). If all the windows had been replaced, then the number of windows replaced was equal to the number of windows in the home; if only some of the windows had been replaced, then we let the number of windows replaced equal one-third the number of windows in the home. If all the windows had been replaced, the type of replacement window was the same as the type reported to describe most of the windows in the home (Question H-9). If some had been replaced, then their type was reported in a separate question (Question H-13).

Window area was based on the assumption that an "average" window was 15 square feet. This figure was based on an analysis of the 1980 RECS. In 1980, the RECS collected not only the total number of windows but also the number of small, medium, and large windows. A small window was defined as less than 6 square feet, medium as 6 to 24 square feet, and large as more than 24 square feet. We compared estimates derived from values using the three sizes (defining small as 4 square feet, medium as 15 square feet, and large as 30 square feet) and estimates made assuming all windows were "medium" sized windows (15 square feet). Estimates of total window area and mean window area by type of home and Census region did not differ much when using the two methods. Therefore, we concluded that it was not necessary to collect the size category for each window because using 15 feet square feet as an average window size would produce reasonable estimates.

The number of sliding glass doors was collected in question H-6. Sliding glass doors were assumed to be a standard size of 6 feet by 6 feet 8 inches (40 square feet).

The computation of window area as a percent of floorspace used heated floorspace rather than total home area, because basement, attic, garage, and porch windows were included only if they were found in a heated area. About one percent of the households in the sample reported having no heated area in their homes. These homes were all located in the West or the South, so we assumed that no heating was required because of the climate. Since the windows in these homes were still counted, we used the total home area for these cases.

Poverty

The U.S. Bureau of the Census provides a threshold of poverty based on family income and the number of household members (Table B3). Households with incomes below the poverty threshold are defined as "Below 100 Percent of Poverty." Households with income below 125 percent of the poverty threshold are defined as "Below 125 Percent of Poverty." Because the RECS income data were collected by using categories of income, an exact match of Census thresholds could not be made. Table B3 provides a cross-reference between the Census thresholds and the RECS income categories. An additional source of error in the determination of poverty status is the nonsampling error in the reported family income.[29]

Table B3. Definition of Poverty in the United States as Used in the 1993 RECS
(Dollars)

Number of Persons per Family	Below 100 Percent of Poverty		Below 125 Percent of Poverty	
	1993 RECS Income Range Less Than[1]	Census Threshold[2]	1993 RECS Income Range Less Than[1]	125 Percent Threshold[2]
1 and respondent is 64 or Younger	7,500	7,517	9,000	9,396
1 and respondent is 65 or Older	7,500	6,930	9,000	8,663
2 and householder is 64 or Younger	10,000	9,726	12,500	12,158
2 and householder is 65 or Older	9,000	8,741	11,000	10,926
3	11,000	11,521	14,000	14,401
4	15,000	14,764	17,500	18,455
5	17,500	17,459	22,500	21,824
6	20,000	19,710	25,000	24,638
7	22,500	22,240	27,500	27,800
8	25,000	24,773	30,000	30,966
9 or More	30,000	29,605	35,000	37,006

[1]The income category that contained the Census threshold was taken as the upper limit in defining poverty when the Census threshold was equal to or above the midpoint of the income category. For example, the threshold of $7,517 was above the category $6,000 to $7,499, but was below the midpoint of $8,250 for the next highest category $7,500 to $8,999.

[2]Preliminary data from the Bureau of the Census (see Source). The average poverty thresholds were derived by increasing the 1992 thresholds by a factor of 1.02993, which reflects the percent change in the average annual Consumer Price Index between 1992 and 1993. These estimates may differ by a few dollars from the thresholds that will be published by the Bureau of the Census in their final report on the 1993 poverty population.

Sources: ● Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-B of the 1993 Residential Energy Consumption Survey (RECS); RECS Public Use Data Files; ●U.S. Bureau of the Census, Housing and Household Economic Statistics Division, Poverty and Wealth Statistics Branch, private communication, September 1994.

[29]A 16-page comparison between CPS and RECS income data is contained in the technical report *Characterizing the Impact of Energy Expenditures on Low Income Households: An Analysis of Alternative Energy Burden Statistics*, available from the Division of Energy Assistance, Office of Community Services, Administration for Children and Families, U.S. Department of Health and Human Services.

Gas Central Air-Conditioning

Some respondents who have electric central air-conditioners incorrectly report that they have gas air-conditioners. In the 1993 RECS, the question on the fuel used to run the air-conditioner was deliberately worded in a way that would suppress answers that the fuel was natural gas or propane. The question in 1993 elicited 54 answers of natural gas and 5 answers of propane from a total of 6,918 personal interviews. This was somewhat fewer responses than received in the 1990 RECS, when 74 respondents reported using natural gas and 3 using propane out of a total of 4,840 personal interviews. There is a danger that the question discourages some who have gas air-conditioning from responding affirmatively, but the overriding bias in asking about air-conditioning fuel is an inflated estimate of gas air-conditioning. The best method available in the RECS is to look for a pattern in the natural gas utility bills that indicates increased usage during periods of demand for air-conditioning. When bills were not available, a followup call was made to the household to confirm usage of natural gas or propane. The final data file contained nine households that were confirmed as using natural gas and one household as using propane for central air-conditioning.

Comparison with Other Data Sources

American Housing Survey (AHS). The AHS and the RECS were both conducted in 1993; for RECS, the population was estimated as of July and for AHS, as of October. The AHS used an estimate of the total population of occupied housing units that was smaller than the one used for RECS. The AHS derived their estimate of 94,724 thousand households from the 1990 Census plus change since then. The RECS used an estimate of 96,631 thousand households based on extrapolation from the 1991 and 1992 Current Population Surveys. The difference between the total number of households in the AHS and the RECS reflects differences between the CPS and the AHS.

AHS and RECS differ in the percentage distribution of households according to the year they were built. The percentage of units built during the 1970's is 3.2 percentage points lower than the AHS (Table B4).

Table B4. Estimates of Occupied Housing Units in the United States for RECS and AHS, 1993

Year of Construction	Percentage of Occupied Housing Units (Households)		
	1993 American Housing Survey	1993 Residential Energy Consumption Survey	Difference in Percentages between RECS and AHS
1939 or Earlier	21.0	21.1	0.1
1940 to 1949	8.0	7.1	-0.8
1950 to 1959	13.0	13.5	0.5
1960 to 1969	15.2	15.5	0.3
1970 to 1979	22.0	18.8	-3.2[a]
1980 to 1984	7.6	8.8	1.2
1985 to 1989	8.4	9.1	0.7
1990 to 1993	4.8	6.1	1.2
Total	100.0	100.0	--

[a]Difference is statistically significant at the 95 percent confidence level.

Note: Because of rounding, numbers may not add to totals.

Sources: ●Energy Information Administration, Forms EIA-457A-C of the 1993 Residential Energy Consumption Survey; ●U.S. Department of Commerce; ●U.S. Department of Housing and Urban Development, *American Housing Survey for the United States in 1993*, Current Housing Reports H150/93, February 1995.

Consumer Expenditure Survey (CE). Comparisons between the RECS and the CE estimates of aggregate expenditures for all major household fuels, natural gas, electricity, and fuel oil/kerosene were prepared by the Bureau of Labor Statistics, which conducts the CE.[30] For 1990 data, the CE was 5 percent higher than the RECS for the total of all major household fuels, 2 percent higher for natural gas, and 6 percent higher for electricity. RECS was 5 percent higher than CE for fuel oil/kerosene. The RECS estimates did not include expenditures for end uses when the household paid for some but not all uses of the fuel. Adding these to the aggregates would increase RECS estimates. Another difference between CE and RECS data is that RECS expenditures represent the actual consumption or delivery of fuels for households paying on a budget payment plan. In the 1990 RECS, 15 percent of all households were on a budget payment plan for their main heating fuel. Whether this difference in the type of data collected would contribute to a difference in the annual expenditure is not known, since budget payment plans are adjusted periodically to reflect actual consumption or deliveries.

[30]See E. Raphael Branch, "The Consumer Expenditure Survey: a comparative analysis," *Monthly Labor Review*, December 1994.

Estimates of Housing-Unit Size

Interviewers for the 1993 RECS were given a retractable 50-foot metal tape measure to ascertain the dimensions of housing units. The instructions were to measure the "area enclosed from the weather." This included garages attached to the house, heated or finished attics, and basements enclosed from the weather (see "Floorspace" in "Glossary" for further definition). Interviewers indicated on a rough-drawn diagram of the floor plan which areas were heated and unheated and recorded the dimensions of these areas. Distinguishing heated areas from unheated areas separates the portion of the housing unit that places the demand on the heating system, and provides a more useful basis for analyzing residential energy consumption. All measurements were rounded to the nearest foot during the interview or during the editing process. Interviewers decided whether to measure the home from the inside, taking into account the thickness of inside walls, or from the outside.

Interviewers attempted to measure the size of all 6,918 housing units where personal interviews were conducted. In 6,563 cases, usable measurements were acquired. In 355 cases, the measurements either were not usable or were not made. Although most cases contained the basic information, some imputations were required to produce a final set of 3 measurements for the outside dimensions for each housing unit:

HOME AREA = total square footage of floorspace enclosed from the weather
HEATED = total square footage of heated floorspace
UNHEATED = HOME AREA - HEATED = total square footage of unheated floorspace.

Various pieces of information were missing and were imputed (Table B5). The following three sections describe the imputation procedures followed for each of the three major categories of data.

Table B5. Completeness of Data on Square Footage of Housing Units in the 1993 RECS

Amount of Information Collected	Number of Households	Percent
Complete Set of Dimensions	4,595	66
Outside Measurement of Home	2,990	43
Inside Measurements of Home	1,605	23
Some Data Missing	1,968	28
Information available on heated and unheated areas. Unknown whether dimensions are for inside or outside of home.	1,574	23
Total floorspace known but information on heated and unheated areas is missing. Also may be unknown whether dimensions are for inside or outside of home.	251	4
Basement dimensions missing.	73	1
Information available for all floors except basement. Basement total floorspace known, but information on heated and unheated areas for basement is missing.	70	1
No Usable Measurements	355	5
Total	6,918	100

Notes: ●The floorspace for the 193 households responding by mail was imputed through a hot-deck procedure. ●These mail questionnaires are not included in this table. ●Components may not sum to totals due to independent rounding.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-G of the 1993 Residential Energy Consumption Survey (RECS). RECS Public Use Data Files.

Treatment of Housing Units with Complete Measurements. Complete dimensions were available for 4,595 homes, but the measurements for the 1,605 homes where the measuring was done from inside the home needed to be standardized to outside dimensions. The scaling factor for adjusting inside dimensions to outside dimensions is a function of the floorspace of the first floor, the total floorspace of the home, and the type of housing unit (Equation 1).

$$\begin{aligned} SCALE = \; & 1.15686 \\ & + .0000017 \times FSFF \\ & - .0000011 \times TFS \\ & - .11503 \times IMH \\ & + .065626 \times ISAH \end{aligned} \qquad \textbf{(1)}$$

Where: FSFF is the floorspace of the first floor
TFS is the total floorspace of the home
IMH is the indicator variable for the mobile home and,
ISAH is the indicator variable for the single-family attached home.

The scale factor decreases when the dwelling is a mobile home and when the total floorspace increases. The scale factor increases as the floorspace of the first floor increases and when the dwelling is a single-family attached home. These scale factors, which increased the inside measurements, ranged from 1.04 to 1.22. The median was 1.16.

Equation 3 was developed in the following manner: Regression prediction equations were developed independently for homes measured from the inside and homes measured from the outside. Both equations were used to generate estimates of floorspace for homes measured from the inside. The relationship between the ratio of predicted "outside" to "inside" floorspace, the actual inside floorspace for the first floor, the actual inside total floorspace for these homes, and the housing type were used in fitting the regression Equation 3 for the scale factor.

Treatment of Housing Units with Some Missing Data. The 1,574 cases lacking information as to whether the measurements were made from inside or outside of the home, or a combination of inside and outside, were treated as outside measurements. This solution was arrived at because average predictions based on regression equations using homes measured outside matched average totals for this group very closely, while predictions based on regression equations using homes measured inside underestimated the total square footage.

The 251 cases lacking information on the ratio of heated to unheated space borrowed that ratio from housing units with complete data, on a PSU-by-PSU basis. For most of these cases, information was also lacking as to whether the measurements were inside or outside, and measurements were again assumed to be outside. In 22 of these 251 cases, the measurements were known to be inside measurements and scale factors were used to increase the floorspace estimates.

For the 73 cases with missing basement dimensions, the basement floorspace was imputed by using a simple regression based on the floorspace of the first floor. The heated and unheated areas were determined or imputed and then added to known totals for the remaining floors. In 16 of these 73 cases, the measurements for the remaining floors were known to be inside measurements and scale factors were used to increase the floorspace estimates.

There were 70 cases in which the ratio of heated to unheated space for the basement was unknown. This ratio was imputed by using an appropriate empirical distribution of heated to unheated ratios. Three such distributions were used: one for single-family homes with basements only; one for homes with a basement plus crawl space and/or a concrete slab foundation; and one for basements of homes in buildings with two to four units. In 10 of these 70 cases, the measurements were known to be inside measurements and scale factors were used to increase the floorspace estimates.

Treatment of Housing Units with No Usable Measurements. The following regression equation was used for the 355 cases with no usable data. After HOME AREA had been imputed by use of this equation, the ratio of heated to unheated space was imputed by using the same procedures described above for housing units for which that ratio was missing.

HOMEAREA = Intercept
x Dwelling Type Factor
x Heating Equipment Type Factor **(2)**
x Household Type Factor

Intercept = 135.7 x NROOMS
+ 19.0 x WINDOWS
+ 106.0 x $(TOTBATH)^2$
+ 46.0 x NUMAPPL
+ 785.1 x HVCLSFUN

Where: NROOMS is number of rooms
WINDOWS is number of windows
TOTBATH is number of bathrooms
NUMAPPL is number of major appliances (freezer, refrigerator, dishwasher, clothes washer, clothes dryer, air-conditioner, color TV and black and white TV)
HVCLSFUN is a dummy variable that has a value of 1 if the housing unit has a basement

Dwelling Type Factor = 1
+ 0.095 x SFDTMSTR
- 0.274 x MOBHOME
- 0.031 x RWHS2STR

Where:
SFDTMSTR is a dummy variable that equals 1 if the housing unit is a multi-story, detached single-family home
MOBHOME is a dummy variable that equals 1 if the housing unit is a mobile home
RWHS2STR is a dummy variable that equals 1 if the housing unit is a multi-story, attached single-family home

Heating Equipment Type Factor =
1
- 0.049 x (RMHTER + PORTHT + CKSTV)
- 0.001 x WOODMHT

Where:
RMHTER, PORTHT, and CKSTV are dummy variables that equal 1 if the home's main heating equipment is a room heater, a portable electric or kerosene heater, or a cookstove, respectively
WOODMHT is a dummy variable that equals 1 if the home's main heating fuel is wood

Household Type Factor =
1
- 0.080 x RENTHOME
+ 0.054 x HIGHINCM
+ 0.043 x MIDDINCM
- 0.003 x (POORHSLD x SINGMHLD)
+ 0.077 x HOMEBA80
- 0.025 x HOMEBB59

Where:
RENTHOME is a dummy variable that equals 1 if the household rents the home
HIGHINCM is a dummy variable that equals 1 if the household income is above $50,000
MIDDINCM is a dummy variable that equals 1 if the household income is between $25,000 and $49,999
POORHSLD is a dummy variable that equals 1 if the household income is between $0 and $13,999
SINGMHLD is a dummy variable that equals 1 if there is a single person in the household
HOMEBA80 is a dummy variable that equals 1 if the home was built after 1980
HOMEBB59 is a dummy variable that equals 1 if the home was built before 1959

The prediction equations for outside dimensions were used in the imputations because regression equations based on cases with inside measurements did not yield fits that were substantially better. This procedure eliminated the need to standardize these estimates to outside dimensions.

Annual Consumption and Expenditures

The consumption and expenditure data that were obtained from the suppliers did not list the annual amounts. Instead, the supplier provided the monthly billing records generally for a 15-month period. Some periods began as early as October 1992 and others ended as late as October 1994. These records listed the amount purchased, the cost of the purchase, and the date of purchase. For natural gas and electricity, the amount purchased was usually equivalent to the amount consumed. The major exception occurred when the supplier had estimated the bill for the billing period. For fuel oil, kerosene, and LPG, the fuel purchased in 1993 may be consumed in 1994 instead of 1993. Conversely, the fuel consumed in 1993 may have been purchased in 1992. The procedures that were used to calculate the annual consumption and expenditure amounts for electricity and natural gas were designed to avoid estimated bills when possible. The annual consumption and expenditure amounts for fuel oil, kerosene, and LPG reflected the amounts purchased. No attempt was made to distinguish between the amount purchased and the amount consumed for fuel oil, kerosene, and LPG.

Nonresponse Statistics

The proportion of households that did not sign authorization forms for suppliers to release billing data was in the range of 2 to 6 percent for the five fuels. Overall the proportion was 5 percent. Most households that signed authorization forms did so at the time of the personal interview or at the time of completing the mailed questionnaire. To maximize the number of households with records, however, a follow-up request was mailed to those who did not sign a form at the time of the personal interview. About 12 percent of this group returned signed forms in response to the mail request and, therefore, were included in the energy supplier survey.

Factors affecting nonresponse are somewhat different for fuel oil, kerosene, and LPG than they are for electricity and natural gas (Table B6). The most frequent reasons for nonresponse for households using fuel oil, kerosene, or LPG were that the company was unknown or not contacted and that the dealer could not identify the customer. A number of factors contribute to this nonresponse. First, many customers purchase fuel from a number of dealers on a cash-and-carry basis. Second, some customers use several different energy suppliers and pay cash for deliveries. In both cases, few records are kept and efforts to get consumption records for households rarely are successful.

Refusal of companies to participate in the survey was not a significant factor. Some additional factors related to the quality of fuel records are discussed in the following section on data processing and imputations.

Information on the household's participation in Demand-Side Management programs was requested from the electric and natural gas suppliers (Schedule 2 of Form EIA-457 E and F--see Appendix E for copies). A report of the results of this effort comparing this information with similar information collected from the households themselves to determine the optimum method of collecting this type of information will be available in late 1995.

Table B6. Energy Consumption Records for Survey Households Using Electricity, Natural Gas, Fuel Oil, Kerosene, or LPG, 1993
(Percentage of Households Using the Energy Source)

Survey Households and Status of Consumption Records	Electricity (Schedule 1)	Natural Gas (Schedule 1)	Fuel Oil	Kerosene	LPG
Total Households Using the Energy Source					
Number	7,108	4,069	865	272	684
Percent	100.0	100.0	100.0	100.0	100.0
Usable Records Received from Supplier[a]	85.6	77.0	60.5	12.9	71.6
Quantity Estimated by Household[b]	(d)	(d)	(d)	54.8	(d)
Nonusable Records Received from Supplier	1.4	1.5	6.8	4.0	6.4
Household Pays Supplier Directly--No Record Available for the Household	8.0	7.6	14.7	28.4	19.0
Household Not Identified in Company Records	2.7	2.3	3.8	1.8	4.4
Company Refused to Participate	(d)	(d)	1.0	(d)	0.4
Company Unknown or Not Contacted	(d)	(d)	5.2	24.0	9.2
Authorization Form Not Signed	5.3	5.3	4.7	2.6	5.0
Fuel Used Included in Rent or Paid in Other Way[c]	4.9	13.8	17.9	(d)	2.9

[a]Data were unusable for electricity and natural gas if the records covered less than 5 months and included seasonal use (heating or cooling) or if the records covered less than 2 months. Data were unusable for fuel oil, kerosene, and LPG if the record covered less than 1 year.

[b]Households in this group are those that purchased kerosene primarily on a cash-and-carry basis. These households supplied estimated purchases of kerosene during the household interview. In addition, if a household indicated that it had the ability to use LPG, fuel oil, or kerosene—but planned no purchases during 1993—the household was assigned a zero consumption.

[c]These data exclude households that paid for some, but not all, uses of fuel.

[d]Represents or rounds to zero.

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-G of the 1993 Residential Energy Consumption Survey (RECS). RECS Public Use Data Files.

Usable Records

Of a total of 7,111 households that participated in the 1993 RECS, 7,108 used electricity (Table B7). For 87 percent of these cases, the electric utilities provided usable billing records. On the other hand, 272 sample households used kerosene, but the kerosene suppliers provided usable kerosene billing data for only 13 percent of these.

Households lacking consumption records because they do not pay fuel bills directly to fuel suppliers occur most frequently among users of natural gas and fuel oil (see Table B7). These households represent 14 percent of the users of natural gas and 18 percent of the users of fuel oil.

Not all the fuel records that were collected in the energy supplier survey could be used. For example, some records covered too few months and other records were incomplete (Table B7). The problem of nonusable records is small for the metered fuels (electricity and natural gas) since the partial-year records of electricity and natural gas were considered usable. For fuel oil, kerosene, and LPG, the problem of nonusable records was more serious, since 7 percent of fuel oil, 4 percent of kerosene, and 6 percent of LPG records were nonusable. Partial-year records for these fuels were not acceptable.[31]

A variety of information from household respondents as well as from suppliers was reviewed and used as a basis for declaring a fuel oil, kerosene, or LPG record complete or incomplete. Questionnaire information from respondents include the number of suppliers and an estimate of the annual number of deliveries. Suppliers provided dates of onset and termination of service to the household.

Imputations

Households with nonusable records, as described earlier, and households with no records had their annual energy consumption imputed using nonlinear regression techniques. The equations were developed by using RECS sample households that had approximately a full year of acceptable data. Separate regression equations were developed for the five fuels: electricity, natural gas, fuel oil, kerosene, and LPG. These equations are described in Appendix C, "End-Use Estimation Methodology." Regression equations were used to estimate 11 percent of the electricity consumption, 18 percent of the natural gas consumption, 32 percent of the fuel oil consumption, 38 percent of the kerosene consumption, and 21 percent of the LPG consumption (Table B7).

Table B7. Basis of Estimates of Annual Consumption, 1993
(Percent of Total Consumption of Energy Source)

Source of Consumption Data	Electricity	Natural Gas	Fuel Oil	Kerosene	LPG
Actual Billing Records					
330 or More Days[a]	80.2	74.1	67.4	27.8	79.1
146 to 329 Days	8.5	6.3	NA	NA	NA
60 to 145 Days	0.1	*	NA	NA	NA
Not All Uses Paid by Household	0.7	1.9	NA	NA	NA
Estimate from Supplier/Household[b]	NA	NA	0.9	34.4	0.1
Regression Estimate	10.5	17.7	31.7	37.8	20.9
Total	100.0	100.0	100.0	100.0	100.0

*=Less than 0.05 percent.
NA=Not Applicable.
[a]For fuel oil, kerosene and LPG, 365 days were required to consider the record complete.
[b]For kerosene, the estimate was supplied by the household, not the supplier.
Note: Because of rounding, data may not sum to totals.
Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-G of the 1993 Residential Energy Consumption Survey.

The strategy for imputing consumption varied across fuels for two reasons. First, fuels differ in the number of ways they can be used. Electricity, for example, is used for a large number of appliances, water heating, space heating, and space cooling. Kerosene, on the other hand, is used almost exclusively for space heating. As a result, the equation for electricity includes a larger number of terms to represent all of the possible end uses. Second, the number of sample cases also influenced the analysis strategy. For the electric and natural gas equations, there was a large number of sample cases, allowing for the inclusion of a greater number of factors. For example, the electricity equations included a variable for the price of electricity.

A final adjustment was made to all imputed fuel quantities. To maintain the variance structure of the unimputed fuel-consumption data, an error term was added to the predicted fuel consumption rather than imputing a single value for all households with equivalent values for all independent variables in the regression equation. This allowed estimates for sampling error to be calculated without separating imputed from unimputed data.

[31]The number of households with partial-year records, as a proportion of total households using the fuel, is 11 percent for electricity and 10 percent for natural gas.

Missing energy expenditures data were imputed by applying a cost factor to the imputed consumption. The cost factor for electricity and natural gas was derived from the energy consumption records of households in the same neighborhood or geographic area as the household that had missing data. The cost factor for fuel oil and kerosene and LPG was based on regression fits for cost versus quantity for all fuel users.

One group of households that was particularly likely to have their consumption imputed by use of the regression procedures was apartments in buildings of 5 or more units. The amount of their electricity consumption that was imputed was somewhat higher than the average for all households (23 percent); however, 64 percent of their natural gas consumption was imputed and all of their fuel oil consumption was imputed.

Adjusting Annual Energy Consumption and Expenditures for Temperature and Price Variation

The household energy consumption and expenditure data have been adjusted to eliminate the effects of temperature variations and to express the expenditures in constant 1987 dollars.

The household consumption for space-heating was adjusted by a factor derived by dividing the 30-year average (1951-1980) number of heating degree-days by the actual number of survey year heating degree-days for the individual household . Similarly, the household consumption for air-conditioning was adjusted by a factor derived by dividing the 30-year (1951-1980) average number of cooling degree-days by the actual number of survey year cooling degree-days for the individual household. Consumption for water heating, appliances, and other end uses were not adjusted. Table B8 below shows the actual and average degree-days for the 1987, 1990, and 1993 survey years.

Table B8. Annual and 30-Year Average Heating and Cooling Degree-Days

	Heating Degree-Days[2]			Cooling Degree-Days		
Survey Year	Annual	30-Year Average[3]	Annual as a Percent Change from 30-Year Average	Annual	30-Year Average	Annual as a Percent Change from 30-Year Average
1987	4,203	4,537	-7.0	1,368	1,244	10.0
1990	3,887	4,529	-14.0	1,385	1,250	11.0
1993	4,544	4,527	+.4	1,324	1,238	7.0

[2]The 30-year average degree-days used in this adjustment for all three survey years are based on the period from 1951-1980 to assure consistency.

[3]The 30-year averages differ slightly from survey year to survey year because different housing units are included.

Source: National Oceanic and Atmospheric Administration, 1987, 1990, and 1993

The adjustments applied to the expenditure data involve two steps. First, the household expenditures for space heating and air-conditioning were adjusted in the same manner as the consumption data. However, the adjustment for temperature in 1984 used a 1930-1980 50-year average instead of the 1951-1980 30-year average used for 1987, 1990, and 1993. In addition the 1984 adjustment for temperature was also affected by a change in the methodology, beginning in 1987, for assigning degree-days to individual households. Instead of assigning degree-day data from clusters of weather stations (a cluster of weather stations contained within an individual NOAA weather division), data were assigned to housing units from individual weather stations. The result is greater accuracy in weather data for some households. At the national level, the effect is a slight overstatement of the adjusted 1984 heating degree-days and an understatement of the adjusted 1984 cooling degree-days compared to 1987 and subsequent years.

In the second step, the adjusted expenditures from the first step were multiplied by an adjustment factor so that the total expenditures for all 4 years were expressed in constant 1987 dollars. A fuel specific price index for the separate portions of total expenditures for electricity, natural gas, and petroleum products (fuel oil, kerosene, and LPG) were used to reflect the differences in price changes among fuels over time. The adjustment applied to energy expenditures was the result of the formula (1/I*100) where I = the index for each fuel and year. Table B9 shows the indices for each year and fuel.

Table B9. Price Indices by Year and Fuel Type

Year	Electricity	Natural Gas	Petroleum Products
1984	96.52	110.15	136.38
1987	100.00	100.00	100.00
1990	105.28	104.72	132.47
1993[1]	110.34	106.09	115.90

[1]The price indices applied to 1993 data were those derived for 1992. 1993 indices were not available at the time of this publication.

Source: Energy Information Administration, Energy Price and Expenditure Data System, 1992

Estimation of Sampling Error

Sampling error is the random difference between a survey estimate and a population value. It occurs because the survey estimate is calculated from a randomly chosen subset of the entire population. The sampling error averaged over all possible samples would be zero, but there is only one sample for the 1993 RECS. Therefore, the sampling error is nonzero and unknown for the particular sample chosen. However, the sample design permits sampling errors to be estimated. This section describes how the sampling error is estimated and how it is made available to readers of this report who are interested in the precision of the estimates in this report.

Throughout this report, standard errors are given as percents of their estimated values; that is, as relative standard errors (RSE). The RSE is also known as the coefficient of variation. Computations of standard errors are more conveniently described, however, in terms of the estimation variance, which is the square of the standard error.

For a given population parameter Y that is estimated by the survey statistic Y', the relative standard error of Y', $RSE_{Y'}$, is given by:

$$\mathrm{RSE}_{Y'} = \left(\frac{S_{Y'}}{Y'} \right) \times 100 \ . \qquad \textbf{(3)}$$

Thus the standard error of Y', is given by:

$$S_{Y'} = \left(\frac{\mathrm{RSE}_{Y'}}{100} \right) \times Y' \ . \qquad \textbf{(4)}$$

This section provides an explanation and example of the procedures used to calculate approximate RSE's for each statistic shown in Tables 5.1 through 5.28 in Chapter 5. This section also includes a discussion of the derivation of the procedures used to calculate the approximate RSE's and explanations of the procedures used to calculate the RSE for percentages and for ratios.

For some surveys, a convenient algebraic formula for computing variances can be obtained. However, the RECS used a multistage area sample design of such complexity (see Appendix A, "How the Survey Was Conducted") that it is virtually impossible to construct an exact algebraic expression for estimating variances. In particular, convenient formulas based on an assumption of simple random sampling, typical of most standard statistical packages, are entirely inappropriate for the RECS estimates. Such formulas tend to give severely understated standard errors, making the estimates appear much more accurate than is the case. Instead, the method used to estimate sampling variances for this survey was balanced half-sample replication. The balanced half-sample replication method involves calculating the value for a statistic by using the full sample and calculating the value for each of a systematic set of half samples. (Each half sample contains approximately one-half of the observations contained in the full sample.) The variance is estimated by using the differences between the value of the statistic calculated by use of the full sample and the values of the statistic calculated by use of each of the half samples.

The half samples are determined by first collapsing the 116 strata used in the sample design into 78 "super" strata to achieve a pairing of the sampling strata. The observations in each of the "super" strata are divided into two sets to form a pair, where each set in the pair contained approximately one-half of the observations in the "super" strata. The 78 "super" strata can be divided into the following groups:

- Thirty-eight of the "super" strata consisted of two non-self-representing Primary Sampling Units (PSU's) belonging to the same Census division, with the observations from one PSU constituting one set in the pair and the observations from the other PSU constituting the other set.

- Thirty-one of the "super" strata consisted of single, large metropolitan areas that were sampled with certainty. The pairs for these "super" strata were formed by dividing the Secondary Sampling Units (SSU) selected from the PSU into two groups. The observations in one of the groups of SSU's constitute one set in the pair. The observations in the other group of SSU's constitute the other set. There was no between-PSU component of variance for self-representing PSU's.

- The nine remaining "super" strata each consisted of a single nonself-representing PSU that was treated as a self-representing PSU. These nine PSU's were not matched due to a desire to: (1) match PSU's with other PSU's in the same Census division, (2) match PSU's consisting of MSA's with PSU's consisting of other MSA's, (3) match PSU's consisting of non-MSA counties with other non-MSA PSU's, and (4) treat Alaska and Hawaii as two separate and unique strata.

Half-sample replication involved repeatedly drawing pair members from the 78 "super" strata. Each replication was called a "half sample" because only one member of the pair within each of the 78 "super" strata was selected. For each half sample, the sampling weights were ratio-adjusted upward. The result of the adjustment is that the sum of the weights for each of the 13 cells (nine Census divisions and four States) equals the appropriate control total (See Table A6). In this way, each half sample can produce unbiased survey statistics based on roughly one-half of the data. Using different combinations of members from the 78 pairs, it is possible to produce a total of $2^{78} = 3 \times 10^{23}$ unique half samples. Although desirable for good variance estimation, such an extremely large number of half samples would be computationally infeasible. However, the method of balanced half-sample replication allows a small number of half samples (approximately equal to the number of "super" strata) to produce estimates of variance that are identical to estimates based on all possible unique half samples for linear survey statistics. The use of ratio adjustments in RECS means that even a statistic giving the number of households in a category is not a linear statistic. For nonlinear survey statistics, the variance estimate computed by use of the method of balanced half samples is approximately equal to the variance estimate computed by use of all possible half samples. With this balancing method, each half sample is constructed by using an orthogonal matrix to control the selection of pair members from the "super" strata. For the 1993 RECS, 96 balanced half samples were used in variance estimation.

The variances are estimated by using the balanced half-sample replication method in the following way. Let Y' be an estimate of the population characteristic Y (for example, total number of households in the West Census region whose main space-heating fuel is natural gas). Then, the estimated variance of Y' is given by:

$$S_{Y'}^2 = \left(\frac{1}{96}\right) \sum_{k=1}^{96} (Y_k' - Y')^2 \ . \qquad \textbf{(5)}$$

Where Y_k' is the k^{th} half-sample estimate of Y. The standard error of Y' is given by:

$$S_{Y'} = \sqrt{S_{Y'}^2} \ . \qquad \textbf{(6)}$$

As mentioned above and in Appendix A, "How the Survey Was Conducted," the national total number of households is not estimated from the survey results. The household weights are ratio-adjusted so that the total weighted number of households equals the number obtained from the CPS. The same is true for the total number of households in the 13 cells mentioned above (nine Census divisions plus four States). The balanced half-sample replicate procedure used for RECS assumes that the CPS numbers are exact and are not subject to error. Any error in the CPS results can be considered as a bias in the RECS results and not as part of the sampling error for RECS.[32] The weights for each half sample are also constructed such that the national total and the total for the 13 cells match the CPS numbers. As a result, the half-sample estimate for the RSE of the national total number of households and the RSE's for the totals in the 13 cells will always be zero. Also, the half-sample estimate of the RSE will be close to zero whenever the statistic involved is a household count that is close to a control total. Examples of this are the national total for the number of households that use electricity and the number of households that have a refrigerator.

Generalized Variances

For every estimate in this report, the RSE was computed by the balanced half-sample replication methods described above. This RSE was used for any statistical tests or confidence intervals given in the text, or to determine if the estimate was too inaccurate to publish (RSE greater than 50 percent).

Space limitations prevent publishing the complete set of RSE's with this document. Instead, a generalized variance technique is provided, by which the reader can compute an approximate RSE for each of the estimates in the detailed tables. For the statistic in the i^{th} row and j^{th} column of a particular table, the approximate RSE is given by:

$$RSE_{i,j} = R_i \times C_j, \qquad \textbf{(7)}$$

where R_i is the RSE row factor given in the last column of row I, and C_j is the RSE column factor given at the top of column j. This value for the relative standard error can be used to construct confidence intervals and to perform hypothesis tests by standard statistical methods. However, because the generalized variance procedure gives only approximate RSE's, such confidence intervals and statistical tests must also be regarded as only approximate.

[32] See American Housing Survey in the earlier section "Comparison with Other Surveys" for an indication of the possible error in the CPS estimates.

Derivation of Row and Column Factors

The row and column factors are determined from a two-factor analysis of the table of RSE's on the basis of the model

$$\log(RSE_{i,j}) = m + a_i + b_j \ . \quad \textbf{(8)}$$

The least-squares estimates for this model are given by:

$$m = \overline{\log(RSE)}$$

$$a_i = \overline{\log(RSE_{i.})} - \overline{\log(RSE)} \quad \textbf{(9)}$$

$$b_j = \overline{\log(RSE_{.j})} - \overline{\log(RSE)}$$

where $\overline{\log(RSE)}$ is the mean of $\log(RSE_{i,j})$ over all rows I and columns j, $\overline{\log(RSE_{i.})}$ is the mean over all columns j for a particular row I, and $\overline{\log(RSE_{.j})}$ is the mean over all rows I for a particular column j. The row and column RSE factors are then computed as

$$R_i = \log^{-1}(m + a_i)$$

$$= \log^{-1}(\overline{\log(RSE_{i.})}) \quad \textbf{(10)}$$

$$C_j = \log^{-1}(b_j)$$

$$= \log^{-1}(\overline{\log(RSE_{.j})} - \overline{\log(RSE)}) \ .$$

The RSE row factor, R_i, is thus the geometric mean of the RSE's in row I, and the RSE column factor, C_j, an adjustment factor with a geometric mean equal to 1.0.

For a few table cells, there were no sample cases, hence no estimate and no RSE. As a result, some of the arrays of directly estimated RSE's had a few missing values. In such cases, the formulas given above for row and column factors still apply, but only after appropriate estimates have been substituted for the missing values.

The estimation procedure used to obtain the row and column factors does not use RSE's that are less than 1.0 percent or greater than 50.0 percent. In addition, if the statistic for a cell is not listed for any reason (high RSE, small cell sample size, or missing data), the RSE for that cell is not used in the procedure. The RSE for this cell is treated as if there was a missing value for this cell. This convention is used because the product of the row and column factors frequently is an inaccurate estimate for these RSE's. Using these cells in the calculation of the row and column factors may result in factors that give inaccurate RSE estimates for other cells.

Whenever a household count is a control total, its RSE is zero. Hence, RSE's of control totals are not used in the row column factor calculations. Rows that contain only control totals have a row factor equal to zero. Rows that contain only household counts that are close to control totals do not have a listed row factor. A footnote tells the reader that the RSE's for all statistics in these rows are less than 1.0 percent. This occurs because the half-sample estimates for the RSE's for all statistics in the row are less than 1.0 percent. The row factors for these rows should be a positive number but the number will be small.

For detailed discussions of the accuracy of the RSE approximation, the procedure for estimating confidence intervals, and the statistical tests of hypotheses, see *Nonresidential Buildings Energy Consumption Survey: Commercial Buildings Consumption and Expenditures 1983*, DOE/EIA-0318(83) (Washington, DC, September 1986).

Determination of Relative Standard Error for Percentages Based on Household Counts

The following procedure can be used for estimates where the population of the numerator is a subset of the population of the denominator. Let X be an estimate of the number of households that have both characteristic C_1 and characteristic C_2. Let Z be an estimate of the number of households that have characteristic C_1 but do not have characteristic C_2. Set Y = X + Z. Then Y is an estimate of the number of households that have characteristic C_1. Set p = 100 X/Y. Then p is an estimate of the percentage of households that have characteristic C_2 among all households that have characteristic C_1. The RSE of p can be approximated by using:

$$RSE(p) = \sqrt{[RSE(X)]^2 - [RSE(Y)]^2}. \quad \textbf{(11)}$$

The following example illustrates this equation. Among the 51.4 million households that used natural gas as their main space-heating fuel, 35.4 million or 69 percent used a central warm-air furnace as the main space-heating equipment (Table 5.17). The approximate RSE for 51.4 million households that used natural gas as their main space-heating fuel was 3.23 percent. The approximate RSE of the 35.4 million households that used a natural gas central warm-air furnace as their main space-heating equipment was 3.57 percent.

By using the above equation, the RSE of the percent is:

This approximation works best when RSE(X) and RSE(Y) are estimated by using the row column procedure or a generalized variance equation. The approximation may differ greatly from the correct value if RSE(X) and RSE(Y) are half-sample estimates. This equation may also produce inaccurate approximations when it is applied to percentages that are not based on household counts or are based on ratios of household counts that cannot be characterized as described above.

$$RSE(p) = \sqrt{3.57^2 - 3.23^2}$$

$$RSE(p) = 1.52. \quad \textbf{(12)}$$

Determination of the Relative Standard Error for Ratios

This procedure can be used when the population of the numerator is not a subset of the denominator but, instead, is one estimate divided by another. The following equation provides an approximate RSE for ratios not presented in the tables.

$$RSE\left(\frac{X}{Y}\right) = \sqrt{[RSE(X)]^2 + [RSE(Y)]^2}. \quad \textbf{(13)}$$

The following example illustrates this equation. The number of households in the coldest climate zone in the country where the main space-heating fuel is natural gas was 4.4 million. The approximate RSE (as determined by the row-column method) was 8.84 percent (Table 5.17). The number in the warmest climate zone where the main space-heating fuel is natural gas was 9.0 million households, with an approximate RSE of 9.35 percent. The ratio of these estimates shows that 2.05 times as many households in the warmest climate zone use natural gas as their main space-heating fuel as in the coldest climate zone. The RSE of this ratio is:

$$RSE\left(\frac{X}{Y}\right) = \sqrt{8.84^2 + 9.35^2}$$

$$RSE\left(\frac{X}{Y}\right) = 12.87. \quad \textbf{(14)}$$

The standard error of the ratio is:

2.05 x (12.87/100) = 0.26

The half-width for the 95 percent confidence interval is:

1.96 x 0.26 = 0.51

The confidence interval for the ratio is 2.05 ($\pm$ 0.51).

Determination of the Standard Error of the Difference Between Two Statistics

The procedure used to compute the standard error of the difference between two statistics follows:

$$S_{X_1 - X_2} = \sqrt{[S_{X_1}]^2 + [S_{X_2}]^2}. \quad \textbf{(15)}$$

This procedure assumes the two statistics are not correlated. By using the above example, the standard error of the 4.4 million households in the coldest climate zone that heat with natural gas was 0.39 million households (Table 5.17). (The RSE is 8.84 percent.) The standard error of the 9.0 million households in the warmest climate zone that heat with natural gas was 0.84 million households. (The RSE is 9.35 percent.) The difference between the number of households in the coldest climate zone and the warmest climate zone was 4.6 million households. The standard error of this difference is:

$$S_{X_1 - X_2} = \sqrt{0.39^2 + 0.84^2} \quad \textbf{(16)}$$

$$S_{X_1 - X_2} = 0.93.$$

If 1.96 times the standard error is greater than the difference between the statistics, the difference is not statistically significant. In this example, 1.96 times the standard error equals 1.82 million households, while the difference is 4.6 million households. Therefore, it can be said that there is a statistically significant difference between the number of households that heat with natural gas in the coldest climate zone and the number that heat with natural gas in the warmest climate zone of the country.

Appendix C

End-Use Estimation Methodology

Appendix C

End-Use Estimation Methodology

Introduction

For each household that responded to the 1993 RECS, the annual amount of energy used for five end-use categories-- space heating, water heating, air-conditioning, refrigerators, and general appliance usage--was estimated. The end-use estimates were produced for each of the five main energy sources: electricity, natural gas, fuel oil, kerosene, and liquefied petroleum gas (LPG). The end-use amounts were not based on data produced by placing meters on individual appliances; rather, they were obtained by estimating how much of the total annual consumption for each energy source can be attributed to each of the end-use categories for each household by using a regression technique.

For each energy source, the annual consumption attributed to each of the end-use categories can be estimated by use of regression equations. The regression equations are also used to impute energy consumption when the billing data are missing or inadequate. A separate equation was developed for each of the five main energy sources. In each equation, the dependent variable was the annual energy consumption for the 1993 calendar year. The set of independent variables varied according to energy source type. The desire to use a large number of independent variables without using a large number of interaction terms and the desire to adapt the regression procedures to account for heteroscedastic[33] error terms led to the use of a nonlinear regression technique. The use of linear regression would have greatly restricted the ability to adequately model household energy consumption.

This appendix provides an overview of the methodology used for the 1993 RECS end-use estimation. The specific regression equations used are not presented here. (For more detailed information, please contact the person cited as the end-use estimation contact on the Contacts page at the beginning of this report.) The procedure used for the 1993 RECS is very similar to that used in the 1990 RECS. Detailed equations for the 1990 RECS were published in Appendix D, "End-Use Estimation Methodology," of *Household Energy Consumption and Expenditures 1990* (Energy Information Administration, February 1993, DOE/EIA-0321(90)).

The second section in this appendix presents a comparison between estimates from the regression equations for households that had some end uses submetered. The households were not part of the RECS sample but were made available to EIA by several utilities.

General Consumption Equations

Basic Equation

For electricity, the basic equation is:

Total Consumption = Space-Heating Component

+ Water-Heating Component

+ Air-Conditioning Component

+ Refrigerator Component

+ Appliance Component.

[33] Error terms are heteroscedastic when the variance of the error terms is not constant but, instead, is a function of the independent variables.

The basic equation was the same for natural gas, fuel oil, kerosene, and LPG; however, (1) the refrigerator component existed only for electricity and (2) the air-conditioning component existed only for electricity and natural gas. Table C1 shows which end uses were estimated for each fuel source. Discussions of each component of the general consumption equation will be followed by a discussion of the nonlinear regression technique.

Table C1. 1993 RECS End-Use Estimation Equations by Fuel Source

	Space Heat	Water Heat	Air-Conditioners	Refrigerators	Appliances
Natural Gas	X	X	X		X
Electricity	X	X	X	X	[1]X
Fuel Oil	X	X			X
LPG	X	X			X
Kerosene	X	X			X

X = End use was estimated for this energy source.
[1]Separate estimate for freezer, lighting, cooking, dishwasher, clothes dryer, and appliance subcomponents.
Source: Energy Information Administration, Office of Energy Markets and End Use, the 1993 Residential Energy Consumption Survey.

General Space-Heating Component

For all energy sources, the space-heating component was defined as all energy used to generate heat by space-heating equipment. The equipment could be the main space-heating equipment or secondary space-heating equipment. Hence, for all energy sources, a household could have had a positive amount of energy assigned to the space-heating component even if the energy source was not used as the main space-heating energy source.

For the electricity equation in the 1987 and subsequent RECS, the electricity associated with the operation of fans in any central forced-air heating equipment was assigned to the electricity appliance component and not to the space-heating component.[34]

General Water-Heating Component

The component for water heating was defined as all energy used to heat water for hot running water, as well as water heated at point sources (such as stoves or auxiliary water-heating equipment) for bathing, cleaning and other noncooking applications of hot water. Energy used at point sources to heat water for cooking and hot drinks was considered part of the general appliance component, as was energy used to heat water for a swimming pool, hot tub, spa, or jacuzzi.

General Air-Conditioning Component

The electricity air-conditioning component was defined as all electricity associated with (1) electric air-conditioning equipment and (2) fans in any central air-conditioning equipment including natural gas air-conditioning equipment. The regression equations for electricity do not contain specific terms for whole-house fans, window fans, and evaporative (swamp) coolers, because the terms were only marginally significant. Hence, the consumption of electricity to operate these fans and evaporative coolers was not assigned to the air-conditioning component; it was included in the appliance component.[35] There is a term for ceiling fans in the electricity appliance component.

In the 1993 RECS, the households that reported that they had air-conditioning equipment but did not use the equipment, were assigned a value of zero for their electricity air-conditioning component. In RECS prior to 1987, these households were assigned small but positive values for their electricity air-conditioning component.

[34]In previous RECS (prior to 1987), the electricity used to run fans for central forced-air heating systems was assigned to the space-heating components. This was changed in the 1987 and subsequent RECS so that the households that did not use electricity as a space-heating energy source (either main or secondary), by definition, did not have positive amounts of electricity assigned to the space-heating component.

[35]Previous RECS (prior to 1987) included a term for evaporative coolers, whole-house fans, ceiling fans, and window fans in the air-conditioning component of the electricity equation. Therefore, the consumption of electricity to operate these types of coolers and fans was assigned to the air-conditioning component. Consequently, some households that did not have air-conditioning equipment, had positive consumption assigned to their air-conditioning component.

The natural gas air-conditioning component was defined as all natural gas used to operate natural gas air-conditioning equipment. There was no air-conditioning component for fuel oil, kerosene, or LPG.

General Refrigerator Component

The refrigerator component for electricity consisted of all electricity used to operate refrigerators. The electricity used to operate freezers that are not part of a refrigerator was assigned to a separate component under General Appliance. There was no refrigerator component for natural gas, LPG, fuel oil, and kerosene.

General Appliance Component

The general appliance component consisted of all energy not used specifically for any of the other end uses. For natural gas, fuel oil, kerosene and LPG, the general appliance component consisted of all end uses other than space heating, water heating, and (for natural gas), air-conditioning. For these fuels, there is the single general appliance component.
For electricity, the general appliance component was split into six subcomponents: (1) Appliance Subcomponent, (2) Lighting Subcomponent, (3) Cooking Subcomponent, (4) Dishwasher Subcomponent, (5) Clothes Dryer Subcomponent, and (6) Freezer Subcomponent. Electricity was the only energy source where the nonlinear regression technique was used to estimate the consumption for subcomponents of the general appliance component.

Energy used in appliances during the winter will frequently help heat the housing unit. This secondary effect of the appliance consumption was not included in the estimation of the space-heating component. In addition, during the summer, energy used in general appliances may add to the load on the air-conditioning system. This was not included in the air-conditioning component.

Appliance Subcomponent. Natural Gas. For natural gas, the appliance subcomponent included outdoor gas lights, pool heaters, clothes dryers, hot tub heaters, natural gas outdoor grills, and other natural gas appliances.

LPG. For LPG, the appliance subcomponent included pool heaters, clothes dryers, and hot tub heaters. The consumption of LPG in outdoor grills was not covered in any LPG component. Households that only use LPG in outdoor gas grills were coded as not using LPG, and their LPG consumption and expenditures were treated as if it were zero.

Fuel Oil. The appliance subcomponent for fuel oil was zero except for 2 households that used fuel oil for heating a hot tub.

Kerosene. The appliance component for kerosene was zero for all households.

Electricity. The appliance subcomponent consisted of all electricity not used for any of the other five subcomponents or the other four main components. This included electricity used to heat water beds, hot tubs and pools, and the electricity used to operate fans (including fans for forced-air, space-heating systems), evaporative coolers, water pumps, small kitchen appliances (such as toasters, mixers, and can openers), home entertainment equipment (such as radios, televisions, stereos, video cassette recorders, electronic games, and computers), and numerous other appliances and uses not covered elsewhere.

Lighting Subcomponent. This subcomponent was estimated only for electricity; it consists of all electricity used for indoor and outdoor lighting. Natural gas lights are included in the appliance component for natural gas.

Cooking Subcomponent. This subcomponent was estimated only for electricity. The cooking subcomponent was positive if the household reported that electricity was the main cooking fuel; otherwise, the subcomponent was zero. The definition of the subcomponent did not involve the type of cooking equipment that was used. Consequently, households with some electric cooking equipment (including microwave ovens) could have been assigned a zero value for the electricity cooking subcomponent if the household did not list electricity as a cooking fuel. The electricity used to operate the electric cooking equipment in households that did not list electricity as a cooking fuel was included in the appliance subcomponent. Similarly, electricity used to operate common kitchen appliances, such as toasters and mixers, was included in the appliance subcomponent.

Dishwasher Subcomponent. This subcomponent was estimated only for electricity. This subcomponent consisted of all electricity used to operate dishwashers.

Clothes Dryer Subcomponent. This subcomponent was estimated only for electricity; it consists of all electricity used to operate clothes dryers. Clothes dryers using natural gas or LPG are included in the appliance component for those fuels.

Freezer Subcomponent. This subcomponent was estimated only for electricity; there was no freezer component for natural gas, LPG, fuel oil, and kerosene. The freezer subcomponent for electricity consisted of all electricity used to operate freezers that were not part of a refrigerator.

Nonlinear Regression Technique

The nonlinear regression technique was used to produce end-use estimates for each household and each energy source. The end-use estimates were normalized so that the sum of the end-use estimates was equal to the actual or imputed yearly consumption for each energy source used by the household. The individual household end-use estimates were used to estimate averages and totals for end-use consumption over selected household categories. The results are presented in the text and in the tables in the "Detailed Statistics" section of this report. Following is an overview of the basic nonlinear equations. (To obtain the detailed equations and individual coefficients, please see the Contacts page at the beginning of this report for the end use estimation contact person.[36])

The general regression equation for each fuel splits estimated consumption into its end-use components. The result is:

$$YCOM = SPHTCOM + WTHTCOM + AIRCCOM + RFRGCOM + APPLCOM,$$

where:

YCOM is the estimated annual consumption,
SPHTCOM is the estimated space-heating component,
WTHTCOM is the estimated water-heating component,
AIRCCOM is the estimated air-conditioning component,
RFRGCOM is the estimated refrigerator component, and
APPLCOM is the estimated appliance component.

The regression equation for electricity splits estimated consumption for the appliance component into 6 additional subcomponents:

$$YCOM = SPHTCOM + WTHTCOM + AIRCCOM + RFRGCOM + FZZRCOM + DISHCOM + COOKCOM + LITECOM + DRYRCOM + APPSCOM,$$

where:

FZZRCOM is the estimated freezer subcomponent,
DISHCOM is the estimated dishwasher subcomponent,
COOKCOM is the estimated cooking subcomponent,
LITECOM is the estimated lighting subcomponent,
DRYRCOM is the estimated clothes dryer subcomponent, and
APPSCOM is the estimated other appliances subcomponent.

The actual annual consumption is called Y. The unit of measure for Y and YCOM is thousands of Btu. This unit of measure is used for all energy sources.

[36]For a detailed discussion of the end-use estimation procedures and the correlation of variables, see the *National Interim Energy Consumption Survey: Exploring the Variability in Energy Consumption*, DOE/EIA-072 (Washington, DC, July 1981); the *National Interim Energy Consumption Survey: Exploring the Variability in Energy Consumption - A Supplement*, DOE/EIA-0272/S (Washington, DC, October 1981); and *Residential Energy Consumption Survey: Regression Analysis of Energy Consumption by End Use*, DOE/EIA-0431 (Washington, DC, October 1983).

The typical regression error term is as follows:

$$e_1 = Y - YCOM .$$

Unfortunately, the variance of e_1 tends to increase as YCOM increases. Furthermore, the distribution of e_1 is skewed in the positive direction. These two facts violate the assumptions associated with linear least-squares regression. On the other hand, the distribution of

$$e_2 = (Y)^{1/4} - (YCOM)^{1/4}$$

is closer to being normally distributed with a constant variance. Hence, a nonlinear least-squares regression procedure that minimizes the sum of squares of e_2 was used.

For each energy source, the dependent variable was the household's consumption as reported on the RECS Suppliers Survey in thousands of Btu. The specific set of independent variables was not the same for all energy sources. Most of the independent variables are derived from information reported by the individual households on the Household Survey. The end-use components consisted of sums or products of terms that themselves may have been sums or products of the independent variables. The overall methodology may seem complex at first glance, but there was a common structure. In general, the components consisted of an overall term multiplied by various adjustments. This format allowed the components to be adjusted by many factors. The relative size of the adjustments was easy to determine.

The disadvantage of the format was that it yields a basic equation that is intrinsically nonlinear. As a result, standard multivariate linear regression techniques could not be used to estimate the parameters. A nonlinear technique was used. The parameters were estimated by using the nonlinear regression procedure (PROC NLIN) contained in the statistical computer package, SAS.[37]

Comparison of RECS Electricity End-Use Estimates to Submetered Data

One approach to testing the validity of end-use estimates from the RECS regression procedure is to compare the estimates with submetered end-use estimates obtained from individual households. The 1987 Residential Energy Consumption Survey (RECS) electricity end-use regression estimates were compared with submetered estimates obtained from households that **were not a part of the 1987 RECS**.[38] This study suggested a disagreement between the RECS end-use estimates and the submetered estimates for space conditioning and water heating. Therefore, a further study was warranted where RECS electricity end-use regression procedures could be used on households **which were also submetered**.[39] This new study of the validation of the 1990 RECS end-use regression estimates also suggested a difference between the RECS estimates and the submetered estimates for space conditioning and water heating.[40] This new study is described below.[41]

[37] Statistical Analysis System (SAS) Institute (Cary, North Carolina).

[38] See “Comparison Between Residential End-Use Submetering and Conditional Demand Estimates For a National Survey” in Performance Measurement and Analysis—ACEEE 1990 Summer Study on Energy Efficiency in Buildings, Volume 10, pp. 10.5-10.13., American Council for an Energy-Efficient Economy, Washington, DC.

[39] The best test of the accuracy of statistically derived RECS end-use estimates based on a regression procedure would be to submeter the energy-using equipment in those RECS households. Alternatively, the RECS interviewers could interview the occupants of the housing units that were used for the submeter studies. However, resources were not available to complete either study.

[40] See "Appendix D. End-Use Estimation Methodology" in *Household Energy Consumption and Expenditures 1990* (DOE/EIA-0314(90)). This appendix documents EIA's 1990 RECS regression procedures not only for electricity but also for natural gas, fuel oil, liquefied petroleum gas, and kerosene.

[41] For another report of this study, see "Validation of Conditional Demand Estimates: Does It Lead to Model Improvements?" Resource Planning Methodologies, Proceedings from the *ACEEE 1994 Summer Study on Energy Efficiency in Buildings*, Volume 7, pp. 7.13-7.22. American Council for an Energy Efficient Economy, Washington, D.C.

Submetered Data

The following five utilities provided submetered end-use data, along with at least 12 months of total electricity consumption data, and household and housing unit characteristics for the participating households.

	Sample Size	
	Sent	**Used**
City of Austin	16	13
Santee Cooper	36	33
Bonneville Power Administration (BPA)	96	62
Southern California Edison (SCE)	290	56
Pacific Gas and Electric (PGE)	490	182

Those households missing information, either survey data or submetered data that were crucial to the RECS procedure were deleted from the final data set, leaving a sample that varied in size from 13 for the City of Austin to 182 for PGE.

Modified RECS Procedures

The RECS end-use estimation procedures produced statistically-derived regression estimates of end-use electricity consumption. These were developed for each of the participating utilities, and were applied to all households served by the utility. Since the household data from each utility company were not as extensive as the 1990 RECS data, a modified regression end-use procedure containing only explanatory variables from the utility data set was created for each utility. Wherever possible, explanatory variables from the utility data set were used as substitutes for RECS variables, and these changes were reflected in the modified regression procedure. Often, however, no adequate substitutes were available, and variables from the full 1990 RECS procedure were excluded in the modified procedures. The modified procedures, therefore, are abbreviated versions of the full 1990 RECS end-use procedure.

The development of the modified procedures provided insight into the relative importance of the individual explanatory variables. Many of the explanatory variables could be dropped from the procedure without a resulting large impact on the end-use estimates. On the other hand, certain variables were identified as being of core importance. One variable that was identified as being of core importance for the electricity air-conditioning end-use estimates was the question concerning how often the household used their air-conditioning equipment. Unfortunately, none of the submetering studies asked a similar question of their respondents. The relative importance of this variable was one of the reasons more "usage" variables were added to the 1993 RECS questionnaire.

To assess the quality of the modified procedures, the procedures were applied to the 1990 RECS data in order to compare them to the end-use estimates that were made for the 1990 RECS data file using the full procedures. This comparison could only be done on the RECS data, because the utility data sets did not contain the more extensive set of variables that are used in the full RECS procedures. However, rather than use all the RECS households, a reduced set was selected that was somewhat more representative of the utility service area than was the RECS national sample. The criteria for selection differed for each utility and end use but usually focused on Census division, climate zone, primary sampling unit, type of home, and type of equipment. Comparing these two sets of estimates led to development of an adjustment index for the modified regression procedures that is described below.

Adjusted Procedures

Although, in general, the five modified procedures performed well, some specific end uses for some of the utilities seemed particularly deficient. For example, lacking information from the submetered households on how often the air conditioner is used during the summer, the RECS modified procedures were apparently allocating too much energy use to air-conditioning. To correct for this type of missing variable in the modified procedures, adjustment indices were developed by using selected RECS household-based median estimates from the full 1990 RECS and modified procedures. Using median estimates from selected RECS households, an adjustment index was calculated for each end use per utility by dividing the median estimates from the full procedure by the median estimate from the modified RECS procedures:

Adjustment Index = full 1990 RECS end-use procedure median end-use estimate/
modified RECS end-use procedure median end-use estimate.

The modified procedure for each utility was applied to the total household consumption for that utility's submetered sample and the resulting end-use estimates multiplied by the appropriate adjustment index. These are the "Adjusted Modified" estimates (Figure C1).

Summary of Findings

Air-Conditioning and Space Heating

Previous research on this topic has suggested that there are differences between the RECS end-use estimates and the submetered estimates. The results from this study partially support those findings (Figure C1). All five utilities have submetered estimates for either space heating or air-conditioning. The dominant pattern among these end-uses is that the modified procedures produce higher estimates than the submetered data. Austin, PGE, and SCE support this pattern completely. For Santee Cooper, space heating is higher, but air-conditioning is lower. For BPA, however, the modified procedure appears to be assigning estimates that are quite close to the submeter estimates.

Water Heating and Appliances

Four of the five utilities have water heating submetered estimates. Three of the four--Austin, BPA, and PGE support the earlier findings that water-heating estimates are lower than submetered estimates. However, water heating is overestimated for Santee Cooper. These differences are smaller than the space heating and air-conditioning estimates. Three of the utilities have estimates for refrigeration and three have estimates for total appliances. For these two end-uses, the modified procedures differ little from the submetered estimates.

Adjusted Modified Estimates

Comparing the "adjusted modified" estimates, the findings change in two ways. First, the sign for both the air-conditioning and water-heating comparisons change for Santee Cooper. After adjustment, the Santee Cooper estimates follow the same pattern as Austin, PGE, and SCE. However, the adjustment serves to further separate BPA from the other utilities. After adjustment, space heating is lower and water heating is higher than the submetered estimates.

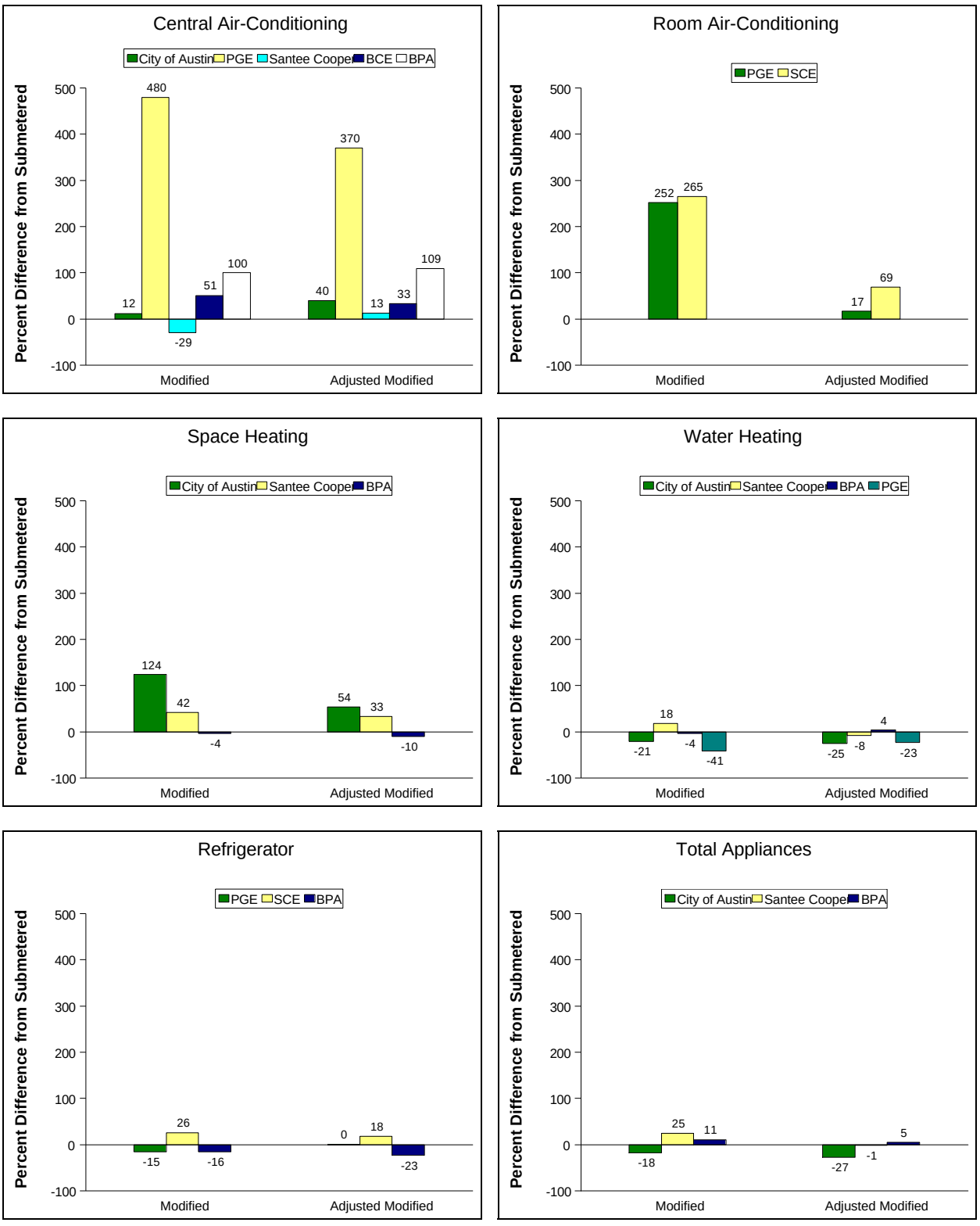
Potential Sources of Errors in RECS Procedures

The RECS procedure starts with the annual consumption amounts. It does not use the monthly bills directly. Use of the varying levels of consumption apparent from the monthly bills, along with degree-day data, should improve the RECS estimation procedures. The annual consumption amounts are used instead of the monthly bills because of time constraints. Use of the monthly bills would take longer and thus delay the RECS data processing and the publication of the RECS results.

The earlier validation of the 1987 RECS procedure hypothesized that the higher air-conditioning estimates might be caused by omitted variable bias. Variables that are not collected for RECS, yet are important in determining the end-use consumption, include R-values of insulation, hot-water output temperature for water heaters, and the amount of extended absences of the entire household. Many of these omitted variables were not collected because of the extra cost of collecting accurate data or the confidential nature of the data (respondents may be fearful of telling us when they are home). If these variables were available, then the RECS estimates should be more accurate, especially for individual cases. The RECS procedure assumes that, for individual cases, the RECS end-use estimates will be off, but the average error will be close to zero when averaged over a large number of RECS respondents.

Another source of potential error is collinearity in the variables used as explanatory variables. For example, a housing unit's space-heating fuel and the water-heating fuel are typically the same. This and collinearity between the explanatory variables for space-heating (size of housing unit) and the explanatory variables for water heating (number of occupants) complicate the end-use estimation problem. Another source of collinearity is the fact that energy used in appliances may reduce the space-heating load in the winter but increase the air-conditioning load in the summer. The RECS procedures do not explicitly take this into account.

Figure C1. Regression Median Estimates Compared to Utility Submetered Estimates, 1990



Source: ACEEE 1990 Summer Study on Energy Efficiency in Buildings, Volume 10, pp. 10.5-10.13, American Council for an Energy-Efficient Economy, Washington, DC.

Another source of potential errors is how variables that influence the consumption for all end uses are placed in the model. This includes income, fuel price, and age of householder. The regression models for electricity and natural gas both assume that high income is a predictor of higher consumption. The structure of the model insures that all end uses are increased by the same proportion when the household is a high income household. If, in fact, high income is associated with higher consumption for some end uses but not others, then the model does not accurately reflect the effect of income on end-use consumption. The same is true for fuel price. The models for electricity and natural gas assume that fuel price affects all end uses by the same proportion. On the other hand, the model specification assumes that the age of the household affects the end uses in different ways. In particular, if the householder is older than 65, the model predicts an increase in the space-heating load and a decrease in the water-heating load.

Potential Differences in RECS and Submetering Sampling Procedures

The universe for the RECS includes all housing units occupied as a primary residence in the 50 States and the District of Columbia. This includes mobile homes, apartments, and small single-family detached and attached homes. The submetering studies may be targeted toward larger single-family detached homes. The RECS universe includes housing units that are used only 6 to 11 months out of the year. The submetering studies may target homes that are occupied the year around. The RECS sampling procedures do not take into account information contained in the utility billing data. The submetering studies may use the billing data in selecting potential respondents. The focus for RECS is annual consumption while the focus for the submetering studies may be for a shorter time period and for time-of-day usage patterns. This difference in the focus may result in differences in the sampling procedures. These potential differences in the sampling procedures may imply that the RECS and the submetering studies have different target populations. The differences in the RECS results and the submetering results may be a consequence of the differences in the sampling procedures.

Comparison of 1990 and 1993 RECS Electricity End-Use Estimates

Five 1993 RECS regression equations were developed by using the 1993 RECS data and household total consumption billing data for the major energy sources: electricity, natural gas, LPG, fuel oil, and kerosene. The resulting end-use estimates are found in Tables 5.11 through 5.28.

Changes in the percent of total electricity for each end use, average end-use consumption, and end-use intensities estimated in 1990 as compared to those estimated in 1993 may give some insight into the effects that changes in the end-use procedures have produced. The best comparisons are the end-use intensities (Table C2) since weather and floor space is held constant. The largest change in end-use intensity is for central air-conditioning. This intensity fell by 15 percent. Some of this change may be due to use of additional variables collected for the 1993 RECS. Another potential reason for the change is the increased efficiency of new central air-conditioning equipment.

Table C2. Total Electricity Consumption by End Use in U.S. Households, 1990 and 1993

End Use	1990		1993		Difference in Percent of Total
	Consumption (quadrillion Btu)	Percent of Total	Consumption (quadrillion Btu)	Percent of Total	
Total Electricity	3.03	100	3.28	100	-
Space Heat	.30	10	.41	16	6
Central Air-Conditioning	.39	13	.37	11	-2
Room Air-Conditioning	.09	3	.08	2	-1
Water Heat	.34	11	.34	10	-1
Appliance	1.41	46	1.63	50	4
Refrigerators	.50	17	.46	14	-3

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-C and E of the 1990 and 1993 Residential Energy Consumption Surveys. For 1993, see Tables 5.2, 5.14, 5.20, 5.21, 5.22, 5.26, and 5.27.

Table C3. Electricity Consumption by End Use in U.S. Households, 1990 and 1993

End Use	Average Consumption (million Btu per Household)			End-Use Intensity		
	1990	1993	Percent Difference	1990	1993	Percent Difference
Main Space Heat	12.3	15.5	26	.92(kWh/ HDD*1000 square feet)	.94(kWh/HDD*1000 square feet)	2
Central Air-Conditioning . .	11.0	9.1	-17	.91(kWh/CDD*1000 square feet)	.77(kWh/CDD*1000 square feet)	-15
Room Air-Conditioning . . .	3.6	3.6	0	.89(kWh/CDD*1000 square feet)	.86(kWh/CDD*1000 square feet)	-3
Main Water Heat	9.5	9.1	-4	1,104(kWh per household member)	1,055(kWh per household member)	-4
Appliance	15.0	16.8	12	NA	NA	NA
Refrigerators	5.3	4.7	-11	NA	NA	NA

NA = Not Applicable.

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457A-C and E of the 1990 and 1993 Residential Energy Consumption Surveys. For 1993, see Tables 5.16, 5.20, 5.21, 5.24, and 5.27.

Appendix D

RECS Coverage Related to EIA Supply Surveys

Appendix D

RECS Coverage Related to EIA Supply Surveys

Introduction

The primary purpose of the Residential Energy Consumption Survey (RECS) is to collect accurate data on energy consumption that can be displayed by detailed characteristics of the household and the housing unit. The data are collected by first contacting the household and then later contacting the energy supplier that supplies the household. RECS provides detailed information about the users and uses of energy and is conducted triennially.

The Energy Information Administration (EIA) also collects data annually on total energy supplied to each major sector via supply surveys of companies that sell or distribute electricity, fuel oil, kerosene, and natural gas to residential customers. Because the RECS and the supply surveys have slightly different definitions of the residential sector, they generally produce different estimates of residential energy consumption. This discussion examines the differences between the RECS and the supply surveys' coverage of the residential sector.

Survey Coverage

RECS Coverage

The RECS design covers all year-round, occupied, residential housing units that are primary residences. It includes multifamily units, mobile homes, farm homes, single-family homes, and homes on military bases. The definition specifically excludes seasonal units, vacant units, and second homes. Because the RECS collects extensive information about each sample unit, one can be explicit about which units are included in RECS and which are excluded. (See Appendix B, section on "Nonsampling Error.")

Supply Coverage

The supply surveys use the following forms to collect data on residential energy consumption:

Form EIA-176, *Annual Report of Natural and Supplemental Gas Supply and Disposition*

Form EIA-821, *Annual Fuel Oil and Kerosene Sales Report*[42]

Form EIA-861, *Annual Electric Utility Report.*

Form EIA-176 must be completed by all gas pipeline companies and other plant operators that deliver gas directly to consumers. The form defines residential consumers as "consumers using gas for heating, air-conditioning, cooking, water heating, and other residential uses in single- and multifamily dwellings and apartments and mobile homes."

Form EIA-821 is sent to a sample of fuel oil distributors to collect information on fuel oil and kerosene sales.

Form EIA-861 is sent to all electric utilities in the United States. Utilities are requested to classify electricity sales as residential if the electricity is supplied to private households and apartment buildings that use electricity primarily for space heating, water heating, air-conditioning, lighting, clothes drying, refrigeration, and cooking.

[42]The data collected on EIA-821 are published as collected and also in an adjusted form. The adjusted data ensure that total sales data equal published volume estimates of products supplied from EIA's *Petroleum Supply Annual*.

In all three forms, seasonal, vacant, and second homes are included in the definition of the residential sector. In forms EIA-861 and EIA-176, consumers who use fuel for both residential and commercial purposes are classified according to the predominant use. Consequently, farm homes or homes on military bases would be classified as residential only if the majority of the fuel supplied was used for residential purposes. Form EIA-821 excludes farm homes and apartment buildings from the residential sector.

Consumption Estimates

Electricity

According to the 1993 American Housing Survey, there were approximately 12 million (11 percent of all residential housing units) seasonal and vacant housing units.[43] Seasonal and vacant housing units are not included in the RECS. About 4 million of these units used electricity for heat and many others probably used some amount of electricity for lights, air-conditioners, and appliances. In addition, the 1993 RECS identified 1.5 million farm households whose electricity bills covered both farm and household use. These units would most likely have been excluded from the supply estimate. In other words, the supply surveys covered at least 2.5 million more electricity consumers than the RECS. Consequently, the supply estimates should be higher than the RECS estimates. In 1993, the supply estimate did exceed the RECS estimate by 3 percent (Table D1).

Table D1. Comparison of Residential Energy Consumption Estimates from the Consumption Survey and Supply Surveys, 1993
(Quadrillion Btu)

Energy Source	Consumption Survey (RECS)	Supply Surveys	Difference (RECS-Supply Survey)	Two Standard Errors (RECS Sampling Error)
Electricity	3.28	3.39	-.11	.12
Natural Gas	5.27	5.10	.17	.35
Fuel Oil	1.02	.91	.11	.12
Kerosene	.05	.08	-.03	[1].01
Liquefied Petroleum Gas[2]	.38	.40	-.02	.07

[1]Difference between the consumption and the supply survey is statistically significant at the 95-percent confidence level.
[2]The liquefied petroleum gas (LPG) data, presented for comparison with the RECS data, are derived from estimates provided by the American Petroleum Institute.
Sources: Energy Information Administration. RECS data are from: Table 5.2. Supply data are from: State Energy Data System.

Natural Gas

The 1993 American Housing Survey estimates that about 33 percent of the seasonal or vacant units heat with natural gas. On the other hand, the 1993 RECS identified few farm households that used natural gas. Therefore, one would expect EIA supply data to equal or exceed RECS data. However, the 1993 RECS estimate of natural gas consumption is 0.17 quadrillion Btu above EIA supply data (Table D1), although this difference is not statistically significant.

An EIA assessment[44] of RECS and the natural gas supply data system for the years 1978 to 1982 attempted to explain the fact that RECS natural gas consumption data were higher than the Form EIA-176 data. One possible reason for the higher RECS estimates is that the RECS classifies large apartment buildings as residential but the supply surveys classify some large apartment buildings as commercial. Twenty-two large utilities were called to determine how they classify large apartments. About half said they classified them as commercial. Large apartment buildings are often billed at commercial rates because they master-meter and use large amounts of fuel. Although the 1993 RECS did not identify master-metered apartments, it did report that 7.5 million households used natural gas for their main space-heat but did not pay directly for their main space-heating fuel. These 7.5 million households used 0.38 quadrillion Btu of natural gas.

[43]U.S. Department of Commerce, Bureau of the Census, *American Housing Survey for the United States in 1993*, H150/93 (February 1995).

[44]Energy Information Administration, *An Assessment of the Quality of Selected EIA Data Series: Energy Consumption Data*, DOE-EIA-0292(85) (April 1986), p. 71.

Fuel Oil and Kerosene

The 1993 American Housing Survey data estimated that 1.1 million of the 2 million vacant or seasonal households heated with fuel oil, while 0.2 million heated with kerosene. The fuel oil and kerosene supply forms specifically requested that respondents exclude apartments from their residential sector data. The 1993 RECS estimated that the number of multifamily units that heated with fuel oil was 2.4 million and the number that heated with kerosene was 0.3 million. Based on these numbers, one would expect the RECS estimate of fuel oil and kerosene consumption to exceed the supply estimates. This was true for fuel oil but not for kerosene, for which the supply estimate exceeded the RECS estimate.

Conclusion

The RECS survey coverage (primary, occupied residences) is defined differently from the "residential sector" as used for EIA supply surveys. Differences in the estimates of residential consumption and supply are thought to be attributable largely to the resulting differences in coverage of residential units between the RECS and the supply surveys.

Appendix E

Survey Forms

Appendix E

Survey Forms

This appendix contains copies of the data collection forms used in this report of the 1993 Residential Energy Consumption Survey (RECS). Forms EIA-457A and B were used to collect data from households. Form EIA-457C was used to interview the household's rental agent. Forms EIA-457D through G were mailed to energy suppliers and Form EIA-457H was used to collect data from households on individual lights. (The original color of each form is indicated.)

- EIA-457A Household Questionnaire - white (including the Authorization Form - yellow and a vehicle data form - blue).
- EIA-457B Household Mail Questionnaire - white.
- EIA-457C Rental Agent Form - white.
- EIA-457D Liquefied Petroleum Gas Usage - blue.
- EIA-457E Electricity Usage - yellow.
- EIA-457F Utility Gas Usage - pink.
- EIA-457G Fuel Oil or Kerosene Usage - green.
- EIA-457H Lighting Supplement - yellow.

Appendix F

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

Appendix F

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

U.S. Census Regions and Divisions

Appendix G

Related EIA Publications on Energy Consumption

Appendix G

Related EIA Publications on Energy Consumption

For information about how to obtain these publications, see the inside cover of this report. Please note that the prices quoted here are subject to change.

In addition to the reports listed below, public-use data tapes and data diskettes for the residential, residential transportation, and commercial sectors are available from the National Technical Information Service (NTIS). To obtain information on how to order the tapes/diskettes, you may call NTIS at 703-487-4650, FAX number 703-321-8547. Data diskettes can also be obtained from the Office of Scientific and Technical Information (OSTI). For OSTI ordering information, call 615-576-8401.

Residential Sector

Housing Characteristics

Note: The survey name was dropped from the beginning of the report title starting with the 1987 data reports.

Housing Characteristics, 1993; June 1995, DOE/EIA-0314(93), GPO Stock No. 061-003-00912-3, $23.00.

Housing Characteristics 1990; May 1992, DOE/EIA-0314(90), GPO Stock No. 061-003-00754-6, $23.00.

Housing Characteristics 1987; May 1989, DOE/EIA-0314(87), GPO Stock No. 061-003-00619-1, $13.00.

Residential Energy Consumption Survey: Housing Characteristics 1984; October 1986, DOE/EIA-0314(-84), GPO Stock No. 061-003-00499-7, $12.00.

Residential Energy Consumption Survey: Housing Characteristics, 1982; August 1984, DOE/EIA-0314(82), GPO Stock No. 061-003-00393-1, $7.00.

Residential Energy Consumption Survey Housing Characteristics, 1981; August 1983, DOE/EIA-0314(81), GPO Stock No. 061-003-00330-3, $6.50.

Residential Energy Consumption Survey: Housing Characteristics, 1980; June 1982, DOE/EIA-0314, GPO Stock No. 061-003-00256-1, $11.00.

Residential Energy Consumption Survey: Characteristics of the Housing Stock and Households, 1978; February 1980, DOE/EIA-0207/2, GPO Stock No. 061-003-00093-2, $4.25.

Residential Energy Consumption Survey: Conservation; February 1980, DOE/EIA-0207/3, GPO Stock No. 061--003-00087-8, $6.00.

Preliminary Conservation Tables from the National Interim Energy Consumption Survey; August 1979, DOE/EIA-0193/P (no GPO Stock No.).

Characteristics of the Housing Stock and Households: Preliminary Findings from the National Interim Energy Consumption Survey; October 1979, DOE/EIA-0199/P (no GPO Stock No. available).

Consumption and Expenditures

Note: The survey name was dropped from the beginning of the report title starting with the 1987 data reports. The titles were changed to *Household Energy Consumption and Expenditures 1987, Part 1: National* and *Part 2: Regional*.

"Household Energy Consumption and Expenditures 1990," *Monthly Energy Review*, August 1993, DOE/EIA-0035(93/08).

Household Energy Consumption and Expenditures 1990; February 1993, DOE/EIA-0321/1(90), GPO Stock No. 061-003-00795-3, $22.00.

Household Energy Consumption and Expenditures 1990\S; DOE/EIA-0321/2(90), GPO Stock No. 061-003-00796-1, $21.00.

Household Energy Consumption and Expenditures 1987, Part 1: National Data; October 1989, DOE/EIA-0321/1(87), GPO Stock No. 061-003-00635-3, $15.00. Note: Energy end-use data are included in this report.

Household Energy Consumption and Expenditures 1987, Part 2: Regional Data; DOE/EIA-0321/2(87) (no GPO Stock No. available), $16.00.

Residential Energy Consumption Survey: Consumption and Expenditures, April 1984 Through March 1985, Part 1: National Data; March 1987, DOE/EIA-0321/1(84), GPO Stock No. 061-003-00519-5, $9.50.

Residential Energy Consumption Survey: Consumption and Expenditures, April 1984 Through March 1985, Part 2: Regional Data; May 1987, DOE/EIA-0321/2 (-84), GPO Stock No. 061-003-00528-4, $17.00. Note: Energy end-use data are included in this report.

Residential Energy Consumption Survey: Consumption and Expenditures, April 1982 Through March 1983, Part 1: National Data; November 1984, DOE/EIA-0-321/1(82), GPO Stock No. 061-003-00411-3, $7.00.

Residential Energy Consumption Survey: Consumption and Expenditures, April 1982 Through March 1983, Part 2: Regional Data; December 1984, DOE/EIA-0-321/2(82), GPO Stock No. 061-003-00414-8, $9.50.

Residential Energy Consumption Survey: Consumption and Expenditures, April 1981 Through March 1982, Part 1: National Data; September 1983, DOE/EIA-0-321/1(81), GPO Stock No. 061-003-00340-1, $6.00.

Residential Energy Consumption Survey: Consumption and Expenditures, April 1981 Through March 1982, Part 2: Regional Data; October 1983, DOE/EIA-032-1/2(81), GPO Stock No. 061-003-00357-5, $8.00.

Residential Energy Consumption Survey: Consumption and Expenditures, April 1980 Through March 1981, Part 1: National Data; September 1982, DOE/EIA-0321/1(80), GPO Stock No. 061-003-00278-1, $7.50.

Residential Energy Consumption Survey: Consumption and Expenditures, April 1980 Through March 1981, - Part 2: Regional Data; June 1983, DOE/EIA-0321/2(80), GPO Stock No. 061-003-00319-2, $7.00.

Residential Energy Consumption Survey: 1979-1980 Consumption and Expenditures, Part 1: National Data (Including Conservation); April 1981, DOE/EIA-0262/1, GPO Stock No. 061-003-00191-2, $6.50.

Residential Energy Consumption Survey: 1979-1980 Consumption and Expenditures, Part II: Regional Data; May 1981, DOE/EIA-0262/2, GPO Stock No. 061-003-00189-1, $8.50.

Residential Energy Consumption Survey: Consumption and Expenditures, April 1978 Through March 1979; July 1980, DOE/EIA-0207/5, GPO Stock No. 061-003-00131-9, $7.50.

Single-Family Households: Fuel Oil Inventories and Expenditures: National Interim Energy Consumption Survey, December 1979, DOE/EIA-0207/1, GPO Stock No. 061-003-00075-4, $3.50.

Other Publications on the Residential Sector

Energy Consumption Series—*Sample Design for the Residential Energy Consumption Survey,* August 1994, DOE/EIA-0555(94)/1, GPO Stock No. 061-003-00865-8, $6.50.

Energy Consumption Series—*User-Needs Study of the 1993 Residential Energy Consumption Survey,* September 1993, DOE/EIA-0555(93)/2, GPO Stock No. 061-003-00819-4, $13.00.

"End-Use Consumption of Residential Energy" *Monthly Energy Review* (Article), pp. vii-xiv, July 1987, DOE/EIA-0035(87/07).

Residential Energy Consumption Survey: Trends in Consumption and Expenditures 1978-1984 June 1987, DOE/EIA-0482, GPO Stock No. 061-003-00535-7, $12.00.

Residential Conservation Measures; July 1986, SR/EEUD/86/01 (no GPO Stock No.).

An Economic Evaluation of Energy Conservation and Renewable Energy Tax Credits; October 1985, Service Report (no GPO Stock No.).

Residential Energy Consumption and Expenditures by End Use for 1978, 1980, and 1981; December 1984, DOE/EIA-0458, GPO Stock No. 061-003-00415-6, $4.50.

Weatherization Program Evaluation, SR-EEUD-84-1; August 1984 (available from the Office of the Assistant Secretary for Conservation and Renewable Energy, Department of Energy).

Residential Energy Consumption Survey: Regression Analysis of Energy Consumption by End Use; October 1983, DOE/EIA-0431, GPO Stock No. 061-00300-347-8, $5.00.

National Interim Energy Consumption Survey: Exploring the Variability In Energy Consumption; July 1981, DOE/EIA-0272, GPO Stock No. 061-003-00-205-6, $5.00.

National Interim Energy Consumption Survey: Ex-ploring the Variability in Energy Consumption--A Supplement; October 1981, DOE/EIA-0272/S, GPO Stock No. 061-003-00217-0, $4.50.

Energy Use by U.S. Households; November 1980, DOE/EIA-0248 (brochure, no GPO Stock No.).

Residential Transportation Sector

Note: The survey name was dropped from the beginning of the report title starting with the 1988 data report, and the report title changed to *Household Vehicles Energy Consumption 1988.*

Household Vehicles Energy Consumption 1991; December 1993, DOE/EIA-0464(91), GPO Stock No. 061-003-00652-3, $14.00.

"Energy Preview: Residential Transportation Energy Consumption Survey Preliminary Estimates, 1991," *Monthly Energy Review*, January 1993, DOE/EIA-0035(93/01).

Household Vehicles Energy Consumption 1988; February 1990, DOE/EIA-0464(88), GPO Stock No. 061-003-00652-3, $11.00.

Residential Transportation Energy Consumption Survey: Consumption Patterns of Household Vehicles 1985; April 1987, DOE/EIA-0464(85), GPO Stock No. 061-003-00521-7, $8.50.

Residential Transportation Energy Consumption Survey: Consumption Patterns of Household Vehicles, 1983; January 1985, DOE/EIA-0464(83), GPO Stock No. 061-003-00420-2, $4.50.

Residential Energy Consumption Survey: Consumption Patterns of Household Vehicles, Supplement: January 1981 to September 1981; February 1983, DOE/EIA-0328, GPO Stock No. 061-003-00297-8, $4.75.

Residential Energy Consumption Survey: Consumption Patterns of Household Vehicles, June 1979 to December 1980; April 1982, DOE/EIA-0319 (no GPO Stock No.).

Commercial Sector

Note: The name of the Nonresidential Buildings Energy Consumption Survey was changed to the Commercial Buildings Energy Consumption Survey, beginning with the 1989 survey. The survey name was also dropped from the report title at that time and subsequently.

Characteristics of Buildings

Commercial Buildings Characteristics 1992; April 1994, DOE/EIA-0246(92), GPO Stock No. 061-003-00850-0, $28.00.

"Commercial Buildings Characteristics 1992," *Monthly Energy Review*, January 1994, DOE/EIA-0035(94/01).

Commercial Buildings Characteristics 1989; June 1991, DOE/EIA-0246(89), GPO Stock No. 061-003-00699-0, $18.00.

Nonresidential Buildings Energy Consumption Survey: Characteristics of Commercial Buildings, 1986; September 1988, DOE/EIA-0246(86), GPO Stock No. 061-003-00580-2, $16.00.

Nonresidential Buildings Energy Consumption Survey: Characteristics of Commercial Buildings, 1983; July 1985, DOE/EIA-0246(83), GPO Stock No. 061-003-00439-3, $7.50.

Nonresidential Buildings Energy Consumption Survey: Characteristics of Commercial Buildings, 1983; A Supplemental Reference, DOE/EIA-M008, $22.95. Available from the NTIS, Order No. DE-85015581.

Nonresidential Buildings Energy Consumption Survey: Fuel Characteristics and Conservation Practices; June 1981, DOE/EIA-0278, GPO Stock No. 061-003-00200-5, $9.00.

Nonresidential Buildings Energy Consumption Survey: Building Characteristics; March 1981, DOE/EIA-0246, GPO Stock No. 061-003-00171-8, $6.50.

Consumption and Expenditures

Commercial Buildings Consumption and Expenditures 1989; April 1992, DOE/EIA-0318(89), GPO Stock No. 061-003-00753-8, $25.00.

Nonresidential Buildings Energy Consumption Survey: Commercial Buildings Consumption and Expenditures 1986; May 1989, DOE/EIA-0318(86), GPO Stock No. 061-003-00613-2, $19.00.

Nonresidential Buildings Energy Consumption Survey: Commercial Buildings, Consumption and Expenditures 1983; September 1986, DOE/EIA-0318(83), GPO Stock No. 061-003-00496-2, $13.00.

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures, Part 1: Natural Gas and Electricity; March 1983, DOE/EIA-0318/1, GPO Stock No. 061-003-00298-6, $9.50.

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures, Part 2: Steam, Coal, Fuel Oil, LPG, and Total Fuels; December 1983, DOE/EIA-0318(79)/2, GPO Stock No. 061--003-00366-4, $6.00.

Other Publications on the Commercial Sector

Energy Consumption Series— *Energy End-Use Intensities in Commercial Buildings*, September 1994, DOE/EIA-0555(94)/2, GPO Stock No. 061-003-0087-9, 9.00.

"Assessment of Energy Use in Multibuilding Facilities," *Monthly Energy Review*, December 1993, DOE/EIA-0035(93/12).

Energy Consumption Series—*Assessment of Energy Use in Multibuilding Facilities*, August 1993, DOE/EIA-0555(93)/1, GPO Stock No. 061-003-00817-8, $7.50.

Energy Consumption Series—*User-Needs Study for the 1992 Commercial Buildings Energy Consumption Survey*, September 1992, DOE/EIA-0555(92)/4, GPO Stock No. 061-003-00770-8, $8.50.

Energy Consumption Series—*Lighting in Commercial Buildings*; March 1992, DOE/EIA-0555(92)/1, GPO Stock No. 061-003-00749-0, $6.50.

Industrial Sector

Manufacturing Consumption of Energy 1991, December 1994, DOE/EIA-0512(91), GOP Stock No. 061-003-0087-9, $34.00.

"Energy Preview: Manufacturing Energy Consumption Survey Preliminary Estimates, 1991," *Monthly Energy Review*, September 1993, DOE/EIA-0035(93/01).

"Energy Efficiency in the Manufacturing Sector," *Monthly Energy Review* (Article), p.1, December 1992.

Manufacturing Energy Consumption Survey: Changes in Energy Intensity in the Manufacturing Sector 1980-1988, December 1991, DOE/EIA-0552(80-88). GPO Stock No. 061-003-00734-1, $4.75.

Manufacturing Energy Consumption Survey: Manufacturing Fuel-Switching Capability 1988; September 1991, DOE/EIA-0515(88), GPO Stock No. 061-003-00720-1, $9.00.

Manufacturing Energy Consumption Survey: Consumption of Energy, 1988; May 1991, DOE/EIA-0512(88), GPO Stock No. 061-003-00703-8, $11.00.

Manufacturing Energy Consumption Survey: Energy Efficiency in Manufacturing, 1985; January 1990, DOE/EIA-0516(85), GPO Stock No. 061-003-00650-7, $4.25.

Manufacturing Energy Consumption Survey: Fuel-Switching Capability, 1985; December 1988, D-OE/EIA-0515(85), GPO Stock No. 061-003-00601-9, $3.50.

Manufacturing Energy Consumption Survey: Methodological Report, 1985; November 1988, DOE/EIA-0514(85), GPO Stock No. 061-003-00595-1, $6.00.

Manufacturing Energy Consumption Survey: Consumption of Energy, 1985; November 1988, DOE/EIA-0512(85), GPO Stock No. 061-003-00594-2, $6.00.

"Manufacturing Sector Energy Consumption 1985 Provisional Estimates," *Monthly Energy Review* (Article), pp. vii-x, January 1987, DOE/EIA-0035 (87/01).

Report on the 1980 Manufacturing Industries' Energy Consumption Study and Survey of Large Combustors; February 1983, DOE/EIA-0358, GPO Stock No. 061-003-00293-5, $5.00.

Industrial Energy Consumption, Survey of Large Combustors: Report on Alternate Fuel-Burning-Capabilities of Large Boilers in 1979; February 1982, DOE/EIA-0304, GPO Stock No. 061-003-0233-1, $2.50.

Methodological Report of the 1980 Manufacturing Industries Survey of Large Combustors (EIA-463); March 1982, DOE/EIA-0306 (no GPO Stock No.).

Other Publications on the Industry Sector

Energy Consumption Series—*Derived Annual Estimates of Manufacturing Energy Consumption 1974-1988,* August 1992, DOE/EIA-0555(92)/3, GPO Stock No. 061-003-00766-0, $7.00.

Energy Consumption Series—*Development of the 1991 Manufacturing Energy Consumption Survey*, May 1992, DOE/EIA-0555(92)/2, GPO Stock No. 061-003-00757-1, $5.50.

Cross-Sector

Energy Consumption Series-Buildings and Energy in the 1980's, June 1995, DOE/EIA-0555(95)/1, GPO Stock No. 061-003-00914-0, $6.00.

Energy Consumption by End-Use Sector: A Comparison of Measures by Consumption and Supply Surveys; April 6, 1990, DOE/EIA-0533 (no GPO Stock No. available), $2.50.

Natural Gas: Use and Expenditures; April 1983, DOE/EIA-0382, GPO Stock No. 061-003-00307-9, $5.50.

Public-Use Tapes

Note: All tapes are available through the NTIS.

Residential and Residential Transportation Sectors

Residential Energy Consumption Survey: 1987 and Residential Transportation Energy Consumption Survey, 1988, Order No. PB90-501461, $220.

Residential Energy Consumption Survey: 1984 and Residential Transportation Energy Consumption Survey, 1985; Order No. PB87-186540, $220.

Residential Energy Consumption Survey: 1982 and Residential Transportation Energy Consumption Survey, 1983; Order No. PB85-221760, $220.

Residential Energy Consumption Survey: Consumption and Expenditures, 1980-1981; Monthly Billing Data; Order No. PB84-166230, $220.

Residential Energy Consumption Survey: Housing Characteristics, 1981; Consumption and Expenditures, 1981-1982; Monthly Billing Data; Order No. PB84-1-20476, $220.

Residential Energy Consumption Survey: Housing Characteristics, Annualized Consumption and Expenditures, 1980-1981; Order No. PB83-199554, $220.

Residential Energy Consumption Survey: Household Transportation Panel Monthly Gas Purchases and Vehicle and Household Characteristics, 6/79-9/81; Order No. PB84-162452, $220.

Residential Energy Consumption Survey: Household Screener Survey, 1979-1980; Order No. PB82-114877, $220.

Residential Energy Consumption Survey: Household Monthly Energy Consumption and Expenditures, 1978-1979; Order No. PB82-114901, $220.

National Interim Energy Consumption Survey (Residential), 1978; Order No. PB81-108714, $220.

Commercial Sector

Nonresidential Buildings Energy Consumption Survey: 1986 Data; Order No. PB90-500034, $220.

Nonresidential Buildings Energy Consumption Survey: 1979 and 1983 Data; Order No. PB88-245162, $220.

Public-Use Diskettes

Note: Diskettes are available through the Office of Scientific and Technical Information (OSTI) and NTIS.

Commercial Buildings Consumption and Expenditures, 1992 data, **OSTI** - ASCII or dBase format, order by title, $10 per diskette, $40 set of four. **NTIS** - ASCII or dBase format, order by title, call for prices.

Commercial Buildings Characteristics 1992 data, **OSTI** - ASCII or dBase format, order by title, $10 per diskette, $40 set of four. **NTIS** - ASCII or dBase format: Order No. PB-94-504305, call for prices.

Commercial Buildings Energy Consumption Survey 1989 data, **OSTI** - ASCII format, order by title, $10 per diskette, $40 set of four. **NTIS** - ASCII format: Order No. PB92-504232, $140.

Residential Transportation Energy Consumption Survey 1991 Data, OSTI-ASCII (3 diskettes) or dBase (3 diskettes), order by title, $10.00 per diskette, NTIS-ASCII Order No. PB94-500824, dBase Order No. PB94-500816.

Residential Transportation Energy Consumption Survey 1988 Data, **OTSI** - ASCII or dBase format, order by title, $10 per diskette, $40 for set of four. **NTIS** - ASCII format: Order No. PB91-507269, dBase format: Order No. PB91-507277, $50 each.

Residential Energy Consumption Survey 1990 Data, OSTI-ASCII (3 diskettes) or dBase (2 diskettes) format, order by title, $10.00 per diskette, NTIS-ASCII format, Order No. PB93-506103 or dBase format, Order No. PB93-506095.

Residential Energy Consumption Survey 1987 Data, **OSTI** - ASCII or dBase format, order by title, $10 per diskette, $40 set of four. **NTIS** - ASCII format: Order No. PB-91-505115, $130, and dBase format: Order No. PB-91-505107, $130.

Nonresidential Buildings Energy Consumption Survey 1986 Data, **NTIS** - ASCII format: Order No. PB91-506808, $130.

Planned Publications

Changes of Energy Intensity in the Manufacturing Sector 1985-1991, planned for September 1995.

EPACT Section 407 Data System: Results from Atlanta Clean City Fleet Vehicle Survey, planned for November 1995.

EPACT Section 407 Data Program: The Vehicle Stock and New Survey Findings, planned for December 1995.

Service Report: Federal Buildings Supplemental Survey Results, planned for October 1995.

Measuring Energy Efficiency in the U.S. Economy (Energy Consumption Series); planned for late 1995.

Note: The Energy Information Administration also publishes annually the *State Energy Data Report, Consumption Estimates*, DOE/EIA-0214; the *State Energy Price and Expenditures Report*, DOE/EIA-0376; and the *Monthly Energy Review*, DOE/EIA-0035. These reports contain annual and monthly consumption information derived from EIA supply surveys.

Appendix H

Metric Conversion Factors

Appendix H

Metric Conversion Factors

Data in the Energy Information Administration publications are expressed in units, such as British thermal units, barrels, cubic feet, and short tons, that historically have been used in the United States. However, because U.S. activities involve foreign nations, most of which use metric units of measure, the United States is committed to making the transition to the metric system. The metric conversion factors presented in Table H1 can be used to calculate the metric-unit equivalents of values expressed in U.S. units. For example, 500 short tons are the equivalent of 453.6 metric tons (500 short tons x 0.9071847 metric tons/short tons=453.6 metric tons).

Table H1. Metric Conversion Factors

Type of Unit	U.S. Unit		Conversion Factor	Metric Unit
Mass	Short Tons	X	0.907 1847	= Metric Tons (t)
	Short Tons Uranium Oxide ($U_3 0_8$)	X	0.769	= Metric Tons Uranium (U)
	Short Tons Uranium Fluoride (UF_6)	X	0.613	= Metric Tons Uranium (U)
	Long Tons	X	1.016	= Metric Tons(t)
	Pounds(lb)	X	0.453 592 37[a]	= Kilograms(kg)
	Pounds Uranium Oxide(lb U_3O_8)	X	0.384 645[b]	= Kilograms (Kg)
	Ounces, Avoirdupois(oz)	X	28. 349 52	= Grams(g)
Volume	Barrels of Oil(bbl)	X	0.158 987 3	= Cubic Meters (m^3)
	Cubic Yards(yd^3)	X	0.765 555	= Cubic Meters (m^3)
	Cubic Feet(ft^3)	X	0.028 316 85	= Cubic Meters (m^3)
	U.S. Gallons(gal)	X	3.785 412	= Liter (L)
	Ounces, Fluid(fl oz)	X	29.573 53	= Milliliters (ml)
	Cubic Inches(in^3)	X	16.387 06	= Milliliters (ml)
Length	Miles (mi)	X	1,609 344[a]	= Kilometers (km)
	Yards (yd)	X	0.914 4[a]	= Meters (m)
	Feet (ft)	X	0.304 8[a]	= Meters (m)
	Inches (in)	X	2.54[a]	= Centimeters (cm)
Area	Acres	X	0.404 69	= Hectares (ha)
	Square Miles (mi^2)	X	2,589 988	= Square Kilometers (km^2)
	Square Yards (yd^2)	X	0.836 127 4	= Square Meters (m^2)
	Square Feet (ft^2)	X	0.092 903 04[a]	= Square Meters (m^2)
	Square Inches (in^2)	X	6.4561 6[a]	= Square Centimeters (cm^2)
Temperature	Degrees Fahrenheit (°F)	X	5/9 (after subtracting 32)[a]	= Degrees Celsius (°c)
Energy	British thermal units (Btu)	X	1,055.056	= Joules (J)
	Calories (cal)	X	4.186 8	= Joules (J)
	Kilowatthours (kWh)	X	3.6	= Megajoules (MJ)

[a]Exact Conversion.

[b]Calculated by the Energy Information Administration.

[c]To convert degrees Celsius (°C) to degrees Fahrenheit (°F), multiply by 9/5, then add 32.

Sources: ●General Services Administration, Federal Standard 376B, *Preferred Metric Units for General Use by the Federal Government* (Washington, DC, January 27, 1993), pp. 9-11, 13, and 16. ●National Institute of Standards and Technology, *Special Publications* 330, 811, and 814. ●American National Standards Institute/Institute of Electrical and Electronic Engineers, ANS/EEE Std.268-1982, pp. 28 and 29. ●Energy Information Administration/*Monthly Energy Review August 1993*, Appendix B, p. 161.

Glossary

Account Classification: In this report, this term refers to the way in which suppliers of electricity, natural gas, or fuel oil classify and bill their customers. Commonly used account classifications are "Commercial," "Industrial," and "Residential." Suppliers' definitions of these terms vary from supplier to supplier and from the definitions used in RECS. In addition, the same customer may be classified differently by each of its energy suppliers.

Adequacy of Insulation: The perception of the respondent as to the adequacy of insulation present in the housing unit or how "good" the insulation in the unit is. This term was first used in the 1990 RECS.

Aggregate Ratio: The ratio of two population aggregates (totals). For example, the aggregate floorspace per household is the ratio of the total floorspace in each category to the total number of households in the category.

Air-Conditioned Rooms: The number of rooms the air-conditioning equipment cooled during the summer of 1993. In previous RECS, this question was worded in two different ways--one referred to the number of rooms that *could* be cooled and the other version, to rooms that were *usually* cooled by the air conditioner.

Air-Conditioning: Air-conditioning is one of the five end-use categories in this report. It is defined as cooling and dehumidification of the air in a building by a refrigeration unit driven by electricity or gas. This definition excludes fans, blowers, or evaporative cooling systems ("swamp coolers") that are not connected to a refrigeration unit. Air-conditioning units that are not currently in working condition or are not used are still included in the RECS if they are in place in the housing unit. If the household did not use its air-conditioning equipment during the summer of 1993, no consumption and expenditures are imputed for air-conditioning. (See **Refrigeration Unit** and **Evaporative Cooler--Swamp Cooler**.)

Air-Conditioning Equipment: Either a central air-conditioning system with ducts or window or wall air-conditioners that cool the air in a housing unit by a refrigeration unit driven by electricity or natural gas. Excluded are fans, blowers, or evaporative cooling systems ("swamp coolers") that are not connected to a refrigeration unit. Air-conditioning units that were not in working condition or were not used, are still included in RECS if they are in place in the housing unit. (See **Room Air-Conditioner**.)

Appliance Combination: Refers to several variables created for the stub of the appliance end-use consumption table in the main body of the report. Households were characterized as using or not using a particular combination of appliances.

Appliance Efficiency Standards: The National Appliance Energy Conservation Act of 1987 established minimum efficiency standards for major home appliances, including furnaces, central and room air-conditioners, refrigerators, freezers, water heaters, dishwashers, and heat pumps. Most of the standards took effect in 1990. The standards for clothes washers, dishwashers, and ranges took effect in 1988 because they required only minor changes in product design, such as eliminating pilot lights and requiring cold water rinse options. The standards for central air-conditioners and furnaces took effect in 1992. Appliance efficiency standards for refrigerators took effect in 1993. Virtually no refrigerator models on the market in 1990 met the 1993 standards.

Appliances: One of the main end-use categories in RECS. It is defined as the use of energy for all uses except those covered by space heating, water heating, refrigerators (starting with the 1990 RECS), and air-conditioning. This includes energy used for freezers, lights, televisions, personal computers, washing machines, and most small appliances. Special energy uses for appliances are energy used to heat: food, water for cooking, water for hot drinks, air to dry clothes, water for a swimming pool, water in a water bed. Also included is energy to operate fans for a central forced-air space-heating system and energy for an evaporative cooling system (swamp coolers). (See **End-Use** and for a more complete listing of appliances, see **Appliances Used**.)

Appliances Used: Appliances used in the home during the year, including those loaned to the householder for regular use. Appliances possessed by the household but not used are not counted, except for air-conditioning equipment. Appliances temporarily not in working condition but generally used by the household are included, only if a repair person has been called or the appliance has been taken to a repair shop, except for air-conditioning equipment. Cooking appliances include the following: toaster oven, gas stove-top or burners, gas oven, electric stove-top or burners, electric oven, microwave oven, gas grill (that uses bottled gas or propane), and natural gas grill. Stove-top or burners include range tops and stand-alone cook tops. Range burners and ovens are counted as separate appliances. Cooling appliances include: evaporative cooler (swamp cooler), whole house or attic fan, exhaust fan, window fan, ceiling fan, portable or table fan. Other appliances counted include: refrigerator, freezer, dishwasher, clothes washer and dryer, swimming pool and hot tub pump and heater, television, personal computer, laser printer, waterbed heater, heated aquarium, humidifier, air cleaner, facsimile machine, photocopier, portable space heater, and dehumidifier. (See **Air-Conditioning Equipment** and **Lights**.)

Attic Insulation: Insulating materials in the attic, either placed underneath the roof, on the roof, or on the floor of the attic. (See **Ceiling Insulation** and **Roof Insulation**.)

Authorization Form: A form signed by the RECS household respondent authorizing the energy supplier companies that serve the household to release information on the amounts and costs of energy consumed during a specified reporting period.

Automatic Set-Back or Clock Thermostat: A thermostat that can be set to turn the heating/cooling system off and on at predetermined times and temperatures.

Availability of Natural Gas in the Neighborhood: Respondents were asked "Is gas from underground pipes available in this neighborhood?" The meaning of "available" and "neighborhood" were left to individual interpretation by the respondents. The intent of this question was to determine whether a residence could be "readily" hooked up to a gas line.

Average: The simple arithmetic average for a population; that is, the sum of all the values in a population divided by the size of the population. Population means are estimated by computing the weighted sum of the sample values, then dividing by the sum of the sample weights. (See **Weight**.)

Average Age of Appliances: Respondents were provided four age categories to determine the age of selected appliances (central and room air-conditioners, first and second refrigerators, freezers, water heaters and their main heating system). The midpoint of each category was used to estimate an average age of the appliances. The midpoints for each age category were as follows:

Age Category	Midpoint
Less than 2 years	1
2 to 4 years	3
5 to 9 years	7
10 to 19 years	14.5
20 years or more	20

Backup Fuel: In a central heat pump system, the fuel used in the furnace, which is used for space heating when the outdoor temperature drops below that which is feasible to operate a heat pump. (See **Heat Pump**).

Basement: An enclosed space in which a person can walk upright under all or part of the building.

Baseboard Heating Units: See **Built-In Electric Units.**

Bathroom: For this report, a full bathroom contains a sink with running water, a flush toilet, and a bathtub or shower. A half bathroom contains a toilet or bathtub or shower.

Bedroom: Room intended for sleeping, even if not presently used for sleeping. Number of bedrooms are those that would be listed as descriptive of the apartment or house if it were on the market for sale or rent. A one-room efficiency or studio apartment has no bedrooms.

Billing Period: The time between meter readings. It does not refer to the time when the bill was sent or when the payment was to have been received. In some cases, the billing period is the same as the billing cycle that corresponds closely (within several days) to meter-reading dates. For fuel oil and LPG, the billing period is the number of days between fuel deliveries.

Block-Rate Structure: A utility rate structure in which the charge for energy decreases as the amount of energy consumed increases. A reduced rate charged on succeeding blocks is called a declining rate. An increased rate charged on succeeding blocks is called an inclining rate.

Boiler: A type of space-heating equipment consisting of a vessel or tank where heat produced from the combustion of such fuels as natural gas, fuel oil, or coal is used to generate hot water or steam.

British Thermal Unit: See **Btu**.

Btu (British Thermal Unit): A Btu is defined as the amount of energy required to increase the temperature of 1 pound of water by 1 degree Fahrenheit, at normal atmospheric pressure. Energy consumption is expressed in Btu in this report to allow for consumption comparisons among fuels that are measured in different units. (See **Metric Conversion Factors.**)

Btu Conversion Factors: The Btu conversion factors used for this survey here:

Electricity (site)	3,412	Btu/kilowatthour
Electricity (primary)	10,280	Btu/kilowatthour[45]
Natural gas	1,028	Btu/cubic foot
Fuel Oil No.1	135,000	Btu/gallon
Kerosene	135,000	Btu/gallon
Fuel Oil No.2	138,690	Btu/gallon
LPG (propane)	91,330	Btu/gallon
Wood	20,000,000	Btu/cord.

Built-In Electric Units: An individual electric resistance space heating unit that is permanently installed in the floors, walls, ceilings, or baseboards and is part of the electrical installation of the building. Electric space-heating devices that are plugged into an electric socket or outlet are not considered built-in.

[45] Average energy input of the generation process for fossil-fuel utility plants in the United States for 1993. See Energy Information Administration, *Monthly Energy Review*, April 1995.

Caulking: Moldable sealing material around any windows or doors to the outside that (when put into cracks around the frames of windows or doors, or cracks in other stationary parts of a house) reduces the passage of air and moisture. Caulking comes in a tube and is claylike so it can be molded by hand to fit the space being treated. Caulking can be applied either to the inside or to the outside of the home. It includes materials known as "sealants," "putty," and "glazing compounds."

CDD: See **Cooling Degree-Days (CDD).**

Ceiling Fan: Fans installed on the ceiling.

Ceiling Insulation: Insulating materials placed between the ceiling and the roof. (See **Attic Insulation** and **Roof Insulation**.)

Census Division: A geographic area consisting of several States defined by the U.S. Department of Commerce, Bureau of the Census. (See the map in Appendix F.) The States are grouped into nine divisions and four regions.

Region	Division	States
Northeast	New England	Connecticut, Maine, Massachusetts, New Hampshire, Vermont, and Rhode Island
	Middle Atlantic	New Jersey, New York, and Pennsylvania
Midwest	East North Central	Illinois, Indiana, Michigan, Ohio, and Wisconsin
	West North Central	Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota
South	South Atlantic	Delaware, the District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia
	East South Central	Alabama, Kentucky, Mississippi, and Tennessee
	West South Central	Arkansas, Louisiana, Oklahoma, and Texas
West	Mountain	Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming
	Pacific	Alaska, California, Hawaii, Oregon, and Washington

Census Region: See **Census Division** and the map in Appendix F.

Central Air-Conditioning: See **Air-Conditioning Equipment**.

Central City: Is usually one or more legally incorporated cities within the Metropolitan Statistical Area (MSA) that is significantly large by itself or large relative to the largest city in the MSA. Additional criteria for being classified "central city" include having at least 75 jobs for each 100 employed residents and having at least 40 percent of the resident workers employed within the city limits. Every MSA has at least one central city, which is usually the largest city. Central cities are commonly regarded as relatively large communities with a denser population and a higher concentration of economic activities than the outlying or suburban areas of the MSA. Those parts of the MSA that are not designated as central city are called "suburban." For this report, the central city and suburban areas are called urban areas, whereas, in previous RECS reports, these components were referred to as metropolitan areas. (See **Metropolitan Statistical Area (MSA), Urban, Suburban**, and **Rural**.)

Central Warm-Air Furnace: A type of space-heating equipment where a central combustor or resistance unit--generally using gas, fuel oil, or electricity--provides warm air through ducts leading to the various rooms. Heat pumps are not included in this category. A forced-air furnace is one in which a fan forces air through the ducts. In a gravity furnace, air circulated by gravity relies on the natural flow of warm air up and cold air down; the warm air rises through ducts and the cold air falls through ducts that return it to the furnace to be reheated, thereby completing the circulation cycle.

CEUI: See **Conditional End-Use Intensity**.

CF: See **Cubic Foot (cf)**.

Climate Zone: One of five climatically distinct areas, defined by long-term weather conditions affecting the heating and cooling loads in buildings. The zones were developed by the Energy End Use and Integrated Statistics Division (EEUISD) from seven distinct climate categories originally identified by the American Institute of Architects (AIA) for the U.S. Department of Energy and the U.S. Department of Housing and Urban Development. The zones were determined according to the 30-year average (1951-1980) of the annual heating and cooling degree-days (base 65 degrees Fahrenheit). The zones are defined as follows:

Climate Zone	Average Annual Cooling Degree-Days	Average Annual Heating Degree-Days
1	Under 2,000	Over 7,000
2	Under 2,000	5,500 to 7,000
3	Under 2,000	4,000 to 5,499
4	Under 2,000	Under 4,000
5	2,000 or More	Under 4,000

An individual household was assigned to a climate zone according to the 30-year average annual degree-days for an appropriate nearby weather station. (See **Heating Degree-Days (HDD)** and **Cooling Degree-Days (CDD)**.)

Clothes Dryer: An appliance that dries laundry through the application of heat and rapid air movement. The hot air used is typically heated by electricity or gas, either natural gas or liquefied petroleum gas.

Clothes Washer: An appliance for automatically cleaning home laundry. It has an opening on its top or its front offering access to the washer tub. An agitator, located within the tub, moves the articles to be cleaned through the wash water. The machine is powered by an electric motor connected to the tub and agitator via a transmission, clutches, and linkages. In front-loading machines, the articles are moved by a rotating tube rather than an agitator.

Coal: A combustible mineral substance (carbonized vegetable matter); in this report, the term includes its derivative (formed by destructive distillation or imperfect combustion) coke. Only statistics on the number of households using coal are collected in RECS. (See **Energy Source.**)

Compressor: Used in air-conditioning equipment and usually powered by an electric motor, most compressors are of the reciprocating (piston) type, which compress the refrigerant to maintain the proper pressure in the air-conditioning system. The compressor is contained in the outdoor unit of central air-conditioning systems which usually contains a condenser also. The refrigerant circulates through the tubes with finned surfaces (the condenser), is cooled and condensed to a liquid. (See **Refrigeration Unit**.)

Conditional Energy Intensity: A measure of intensity that adjusts either the amount of energy consumed or expenditures spent for the effects of certain characteristics, such as weather, size of unit, and number of household members for households that use a particular energy source. (See **CEUI, Conditional End-Use Intensity** and **Intensity**.)

Conditional End-Use Intensity (CEUI): A measure of intensity that adjusts either the end-use consumption or expenditures for the effects of certain characteristics, such as floorspace, degree-days, or household members for households that use an energy source for a particular end use. In the case of **space-heating intensity**, only the heated floorspace and heating degree-days are used. The **air-conditioning intensity** uses only the cooled floorspace and cooling degree-days. The **water-heating intensity** adjusts consumption and expenditures for the effects of the number of household members on water-heating consumption. (See **CEUI, Conditional Energy Intensity,** and **Intensity**.)

Conservation Program: As used in this report, a program in which a utility company furnishes home weatherization services free or at reduced cost or provides free or low-cost devices for saving energy, such as energy-efficient light bulbs, water-flow restrictors, weather stripping, and water-heater insulation. (See **Demand-Side Management Programs (DSM).**)

Consumption: The amount of electricity or natural gas used by, or delivered to, the household during a 365-day period. For fuel oil, kerosene, and LPG, the quantity represents fuel purchased, not fuel consumed. If the level of fuel in the tank was the same at the beginning and end of the annual period, then the quantity consumed would be the same as the quantity purchased. Measurements or reports of the level of fuel in the tank were not included in the RECS data collection.

Control Total: The number of elements in the population or a subset of the population. The sample weights for the observed elements in a survey are adjusted so that they add up to the control total. The value of a control total is not obtained from the survey; it is obtained from an outside source. For the RECS, the control totals are given by the number of households in one of the 13 cells by categorizing households by four States and nine Census Divisions. The control totals were obtained from the Current Population Survey. See Table A6 in Appendix A, "How the Survey Was Conducted."

Conversion Factors: See **Btu Conversion Factors** and **Metric Conversion Factors**.

Cooking Stove: A stove built for preparing food. In this survey, it may be used as the main heating equipment. (See **Heating Equipment** and **Appliances**.)

Cooled Floorspace: See **Floorspace**.

Cooling Degree-Days (CDD): A measure of how hot a location was over a period of time, relative to a base temperature. In this report, the base temperature is 65 degrees Fahrenheit, and the period of time is one year. The cooling degree-days for a single day is the difference between that day's average temperature and the base temperature if the daily average is greater than the base and zero if the daily average temperature is less than or equal to the base temperature. The cooling degree-days for a longer period of time is the sum of the daily cooling degree-days for the days in that period. Average daily temperature is the mean of the maximum and minimum temperature for a 24-hour period. Cooling degree-days can also be calculated by using a base temperature other than 65 degrees. The computation is performed in an analogous manner.

Since the 1987 RECS, cooling degree-days for households are taken from records of an appropriate nearby weather station. In previous RECS, weather data were assigned to households according to the NOAA division in which the household was located. (See **Heating Degree-Days (HDD)**, **Climate Zone**, and **30-Year Average Degree-Days**.)

Cord of Wood: A cord of wood measures 4 feet by 4 feet by 8 feet, or 128 cubic feet.

Crawl Space: Space between the ground and the floor of a house in which a person cannot walk upright. An enclosed crawl space is one not accessible from the outside of the house (except by a door or window) because the walls of the crawl space protect it from the weather. A crawl space "open to the outside" is one that is accessible from outside the house, even though it may be covered by a trellis or lathwork or some kind of brickwork that leaves space for circulation of air.

Cubic Foot (cf): As a natural gas measure, the volume of gas contained in a cube with an edge that is 1 foot long at standard temperature and pressure (60 degrees Fahrenheit and 14.73 pounds standard per square inch.) The thermal content varies by the composition of the gas. (See **Natural Gas** and **Btu Conversion Factors.)**

Current Dollars: Unless otherwise noted, all dollar values presented in this report are expressed in the current dollars at the time of the specific RECS data collection. The dollar amounts are not directly comparable across time periods since they have not been adjusted for the effects of inflation. In contrast, real dollars are current dollars that have been adjusted for the effects of inflation.

Dehumidifier: A dehumidifier is an appliance that removes moisture from the air (often used in the summer when the high moisture content of air makes it uncomfortable). (See **Humidifier** and **Humidity**.)

Demand-Side Management (DSM) Programs: These are organized utility-sponsored activities that are intended to affect the amount and timing of customer electricity or natural gas use.

Dishwasher: A built-in or portable appliance used for automatically cleaning dishware, utensils, and cutlery. The national appliance efficiency standards required that, by 1988, dishwashers be equipped with an option to dry without heat.

DSM: See **Demand-Side Management (DSM) Programs.**

Electric Air-Conditioning Intensity: In this report, the ratio of end-use electric air-conditioning consumption or expenditures to square footage of cooled floorspace and cooling degree-days (base 65 degrees Fahrenheit). Only the CDD and square feet for households that have air-conditioning equipment are included in the ratio. The intensity provides a way of comparing different types of housing units and households by controlling for differences in housing unit size and weather conditions. The square footage of cooled floorspace is equal to the product of the total square footage times the ratio of the number of rooms that are cooled to the total number of rooms. If the entire housing unit is cooled, the cooled floorspace is the same as the total floorspace. The ratio is calculated on a weighted, aggregate basis. (See **Floorspace**.)

Electric Pump for Well Water: This pump forces the water from a well below ground level up into the water pipes that circulate through the house. When this pump is not working, there is a limited supply of running water in the house.

Electricity: Metered electric power supplied by a central utility company to a residence via power lines. Since there are no volumetric measures of electricity, as there are with the fossil fuels, electricity is measured as the amount of power used at any instant (demand expressed in watts or kilowatts) or as power used over a given time (consumption expressed in kilowatthours). The heat equivalent for electricity is 3,412 Btu per kWh, but this is a derived form of energy and does not represent the amount of energy needed to generate the electricity and transmit it to the building. Generation and transmission requires about 3 times 3,412 Btu per kWh. Energy is used in preparing other fuels for consumption from their condition as mined and delivering them to a site for use, but these amounts of energy are relatively small compared to the Btu value of the fuel consumed. (See **Primary Electricity** and **Btu Conversion Factors**.)

Electricity Paid by Household: The household paid the electric utility company directly for all household uses of electricity (such as water heating, space heating, air-conditioning, cooking, lighting, and operating appliances.) Bills paid by a third party are not counted as paid by the household. (See **Electricity**.)

Eligible for Federal Assistance: Households are categorized as eligible for Federal energy assistance if their income is below the Federal maximum standard. The Federal standard is 150 percent of the poverty line or 60 percent of statewide median income, whichever is the higher income. Individual States can set the standard at a lower level than the Federal maximum. (See **Poverty Line**.)

End Use: A function for which energy sources or fuels are used in the household. Five main energy end-use categories were estimated: space heating, air-conditioning, water heating, refrigerator, and appliance usage. The amount of energy used for these end uses is estimated by means of a nonlinear regression technique, rather than by using metered data. Although not shown in the tables in chapter 5, end use estimates were also made for the following uses of electricity: freezers, lighting, dishwashers, clothes dryers, and cooking (ranges and ovens). (See **Space-Heating, Air-Conditioning, Water Heating, Refrigerators, Appliances, Metered Data**, and Appendix C, "End-Use Estimation Methodology.")

Energy: The capacity for doing work as measured by the capability of doing work (potential energy) or the conversion of the capability to motion (kinetic energy). Energy has several forms, some of which are easily convertible and can be changed to another form useful for work. Most of the world's convertible energy comes from fossil fuels that are burned to produce heat that is then used as a transfer medium to mechanical or other means in order to accomplish tasks. Electrical energy is usually measured in kilowatthours, while heat energy is usually measured in British thermal units (Btu).

Energy Audit: An inspection carried out by a utility company that determines where and how energy is used and suggests ways energy can be saved or used more efficiently.

Energy Source: A type of energy or fuel consumed by the household. For this report, the energy sources identified are electricity, natural gas, fuel oil, kerosene, liquefied petroleum gas (propane), wood, coal, and solar. (See **Electricity, Natural Gas, Fuel Oil, Kerosene, Liquefied Petroleum Gas (LPG), Wood, Coal,** and **Solar Energy**.)

Energy Supplier: A company that provides electricity, natural gas, fuel oil, kerosene or LPG to the household. (See **Authorization Form** and Appendix A, "How the Survey Was Conducted.")

Estimated Bill: A set of charges for a fuel, calculated by the supplier when the meter is not read. The estimate may be based on one or more of the following factors: past usage, usage by similar households, and weather data.

Evaporative Cooler (Swamp Cooler): A type of cooling equipment using the evaporation of water to cool air. This type of equipment is commonly found in warm, dry climates. Evaporative cooling units do not cool air by use of a refrigeration unit, so for this report they are not considered air-conditioning equipment.

Exhaust Fan: Small fans located in the wall or ceiling which exhaust air, odors, and moisture from the bathroom, kitchen, or basement to the outside.

Expenditures: Charges spent for the energy consumed in, or delivered to, a building during a given period of time. For this report, all expenditure statistics are presented on an annual basis, for calendar year 1993. The total dollar amount includes State and local taxes, but excludes merchandise, repairs, or special service charges. For households on a budget plan, the expenditures are for the actual consumption. Electricity and natural gas expenditures are for the amount of those energy sources consumed. Fuel oil, kerosene, and LPG expenditures are for the amount of fuel purchased, which may differ from the amount of fuel consumed. For households that do not pay their fuel supplier directly, the expenditures for fuels are estimated and included in the tables. (See **Consumption** and Appendix B, "Quality of the Data.")

Expenditures as a Percentage of Income: The annual household energy expenditures divided by the family's annual income. The median percentage is the percentage of income spent on energy for the middle household, when the households are ranked by the percentage they spend on energy. That is, 50 percent of the weighted households in the cell spend a lower percentage on energy than the median value.

Family Income Category: The income grouping for the total combined income (before taxes and deductions) of all members of the family from all sources, for the 12 months prior to the interview. Sources of income include the following: wages, salaries, tips, commissions, interest, dividends, rental income, Social Security or railroad retirement, pensions, food stamps, Aid to Families with Dependent Children, unemployment compensation, Supplemental Security Income, General Assistance and other public assistance. This definition includes the total income of all family members who lived in the household during the 12 months prior to the interview, regardless of whether they were living there at the time of the interview. Income of nonfamily members of the household is not included. "Family" includes the following types of relationships: mother, father, sister, brother, son, daughter, father-in-law, uncle, aunt, niece, grandchild, foster child (and similar relationships).

Fan: An electric appliance that uses a motor to rotate rigid vanes to move air for cooling. (See **Whole-House Cooling Fan**, **Exhaust Fan**, **Window or Ceiling Fan**, **Portable Fan** and **Furnace Fan**.)

Fireplace: Usually a masonry unit which burns wood, that is built into the wall of a house or mobile home and has a permanent chimney. Fireplaces in mobile homes are included. Fireplaces may have glass doors or metal shields to cover the opening into the room. Accessories such as convective grates or radiant grates may be present to increase the efficiency of the fireplace. A free-standing fireplace that can be detached from its chimney is a heating stove. (See **Heating Stove**.)

Fireplace Insert: A heating stove that occupies most of the burning area of a fireplace. Fireplace accessories such as glass doors, metal shields to cover the opening into the room, convective or radiant grates, or air circulation devices (including fans) are not considered fireplace inserts.

Floodlights: Lights that illuminate large areas, often used outdoors. Incandescent floodlights, the most common, are at least 150 watts. Mercury vapor or sodium vapor floodlights are at least 100 watts. Floodlights cannot be fluorescent lights.

Floor, Wall, or Pipeless Furnace: Space-heating equipment consisting of a ductless combustor or resistance unit, having an enclosed chamber where fuel is burned or where electrical-resistance heat is generated to warm the rooms of a building. A floor furnace is located below the floor and delivers heated air to the room immediately above or (if under a partition) to the room on each side. A wall furnace is installed in a partition or in an outside wall and delivers heated air to the rooms on one or both sides of the wall. A pipeless furnace is installed in a basement and delivers heated air through a large register in the floor of the room or hallway immediately above.

Floorspace: The floor area of the housing unit that is enclosed from the weather. For RECS, the following are included in the floorspace: basements, whether or not they contain finished space; finished and/or heated space in attics; and garages, if they have a wall in common with the house. Not included are: crawl spaces, even if they are enclosed from the weather; and sheds and other buildings that are not attached to the house. Floorspace (in square feet) is derived from an actual measurement made by the RECS interviewer using a metallic, retractable, 50-foot tape measure. For details on how the measurement was made and how the data were treated, see "Estimates of Housing Unit Size" in Appendix B, "Quality of the Data."

"Heated Floorspace" is the portion of the floorspace that is heated during most of the winter season. Rooms that are shut off during the heating season to save fuel are not counted as heated square footage. Attached garages that are unheated and unheated areas in basements and attics are not counted as heated square feet.

"Cooled Floorspace" is computed as total floorspace times the percentage of rooms that are cooled over total rooms. This method for calculating cooled floorspace is different from the method used in *Housing Characteristics 1993* that used heated floorspace rather than total floorspace.

Fluorescent Lamps: Usually long, narrow, white tubes connected to a fixture at both ends; some are circular. The tube is coated on the inside with fluorescent material. The lamp produces light by passing electricity through mercury vapor, which causes the fluorescent coating to glow or fluoresce. These lights are typically found in kitchen and basement work areas. Newer types ("compact" fluorescent lamps), looking somewhat more like a conventional bulbs, can be screwed into fixtures. (See **Lights**.)

Freezer: A cabinet designed as a unit for storing food at temperatures of about 0 degrees Fahrenheit and having a refrigeration unit driven by an electric motor. For this report, this is a separate appliance, not part of the refrigerator and can be an upright model (vertical cabinet with the door opening outward) or a chest model (horizontal cabinet with the door opening upward).

Frost-Free Refrigerator: Indicates that the freezer section of the refrigerator automatically defrosts usually on 12- or 24-hour cycles.

Fuel: See **Energy Source.**

Fuel Oil: A liquid petroleum product less volatile than gasoline that is burned for space-heating or water-heating purposes. No. 1 distillate fuel oil is used mostly as a blending stock to assure that heavier grades of fuel flow under severe cold weather conditions. No. 2 fuel oil is the most common form of heating oil. No. 2 distillate collectively refers to No. 2 heating oil and No. 2 diesel fuel. Although these products are not precisely identical, they are essentially interchangeable in most applications. No. 4 distillate is a blend of No. 2 and No. 5 or No. 6 residual fuel oil. No 4 is used in large stationary diesel engines and boilers equipped with fuel preheating equipment.

Fuel Oil Paid by Household: The household paid the supplier directly for all household uses of fuel oil or kerosene (such as space heating or water heating). Bills paid by a third party are not counted as paid by the household. (See **Energy Source**.)

Furnace: Space-heating equipment consisting of an enclosed chamber where fuel is burned or electrical resistance is used to heat air directly, without using steam or hot water. The warm air is for heating, and is distributed throughout the house, typically by air ducts.

Furnace Fan: A fan that forces air through the ducts of a central warm-air furnace.

Gas Air-Conditioning: Cooling and dehumidification of the air in a building by a refrigeration unit using gas (either natural gas or LPG) to isolate the refrigerant. (See **Refrigeration Unit**.)

Gas Paid by Household: The household paid the utility company directly for all household uses of natural gas (such as water heating, space heating, air-conditioning, cooking, and operating appliances, including outdoor gas lights). Bills paid by a third party are not counted as being paid by the householder. (See **Energy Source**.)

Group Quarters: Living arrangement for institutional groups containing 10 or more unrelated persons. Such quarters are excluded from the RECS. Group quarters are typically found in hospitals, nursing homes, military barracks, halfway houses, college dormitories, fraternity and sorority houses, convents, monasteries, shelters, jails, and correctional institutions. Group quarters may also be found in houses or apartments shared by 10 or more unrelated persons. Group quarters are often equipped with a dining area for residents. (See **Housing Unit**.)

Halogen Lamp: A type of incandescent lamp that lasts much longer and is more efficient than the common incandescent lamp. The lamp uses a halogen gas, usually iodine or bromine, that causes the evaporating tungsten to be redeposited on the filament, thus prolonging its life. (See **Incandescent Lamp**.)

HDD: See **Heating Degree-Days** (HDD).

Heat Pump (Reverse Cycle System): A year-round heating and air-conditioning system in which refrigeration equipment supplies both heating and cooling through ducts leading to individual rooms. A heat pump generally consists of a compressor, both indoor and outdoor coils, and a thermostat. In the RECS, only electricity is allowed as the power source.

The heat pump, when attached to a central furnace, is either the main or secondary heating equipment (depending on how often the heat pump operates). If it operates for a short time before the furnace comes on, the heat pump is secondary (or additional) heating equipment. If the heat pump is sufficient to provide the desired warmth, the heat pump is the main heating equipment. Some heat pumps are single-package systems in which the indoor and outdoor coils are contained in the same unit. A window or wall unit heat pump is a single-package system.

An "air-source" heat pump, the most common, extracts heat from the outdoor air. When the outdoor air approaches the freezing point (32 degrees Fahrenheit), the system does not work very well and requires a backup heating fuel. Sometimes a light comes on in the house to indicate that the backup system is operating. A "water-source" heat pump extracts heat from underground water. A "ground-source" heat pump extracts heat from the soil. A water or ground-source heat pump is more efficient that an air-source heat pump because the ground and water are relatively constant in temperature, even when the air temperature is extremely cold or hot, and are closer to desired indoor temperatures.

Heated Floorspace: See **Floorspace**.

Heating Degree-Days (HDD): A measure of how cold a location was over a period of time, relative to a base temperature. In this report, the base temperature used is 65 degrees Fahrenheit and the period of time is one year. The heating degree-days for a single day is the difference between the base temperature and the day's average temperature if the daily average is less than the base, and zero if the daily average temperature is greater than or equal to the base temperature. The heating degree-days for a longer period of time is the sum of the daily heating degree-days for days in that period. Average daily temperature is the mean of the maximum and minimum temperature for a 24-hour period. Heating degree-days can also be calculated using a base temperature other than 65 degrees. The computation is performed in an analogous manner.

Since the 1987 RECS, heating degree-days for households are taken from records of an appropriate nearby weather station. In previous RECS, weather data were assigned to households according to the NOAA division in which the household was located. (See **Cooling Degree-Days (CDD), Climate Zone** and **30-Year Average Degree-Days**.)

Heating Equipment: The equipment used for heating ambient air in the housing unit, such as central warm-air furnace, heat pump, built-in electric units, steam or hot-water system, floor, wall or pipeless furnace, heating stove, room heater, fireplace, or portable heater. The main space-heating equipment is reported as such even if it was built for preparing food. (See also description of specific types of space-heating equipment: **Central Warm-Air Furnace**, **Heat Pump**, **Built-In Electric Units**, **Steam or Hot-Water System**, **Floor**, **Wall or Pipeless Furnace**, **Heating Stove**, and **Room Heater**.)

Heating Stove Burning Wood, Coal, and Coke: Any free-standing box or controlled-draft stove; or a stove installed in a fireplace opening, using the chimney of the fireplace. Stoves are made of cast iron, sheet metal, or plate steel. Free-standing fireplaces that can be detached from their chimneys are considered heating stoves.

High-Intensity Discharge (HID) Lamp: A lamp that produces light by passing electricity through gas, which causes the gas to glow. Examples of HID lamps are mercury vapor lamps, metal halide lamps, and high-pressure sodium lamps.

Hispanic Descent: This, as the question on origin, was self-determined by the respondent. The respondent was asked, "Is the householder of Spanish or Hispanic origin or descent?" and the respondent's answer was recorded.

Hot-Deck Imputation: A statistical procedure for deriving a probable response to a questionnaire item for which a response is missing. To perform the procedure, an analyst sorts the households by variables related to the missing item. Thus, a series of sort categories are formed, which are internally homogeneous with respect to the sort variables. Within each category, households for which the questionnaire item is not missing are randomly selected to serve as "donors" to supply values for the missing item of "recipient" households. (See **Imputation** and Appendix B, "Quality of the Data.")

Hot Tub: Water-filled wood, plastic, or ceramic container in which up to 12 people can lounge. Normally equipped with a heater, which heats the water from 80 degrees to 106 degrees Fahrenheit. It may also have jets to bubble the water. An average-size hot tub holds 200-400 gallons of water. All reported hot tubs were assumed to include an electric pump. These are also called Spas or Jacuzzis.

Household: A family, an individual, or a group of up to nine unrelated persons, occupying the same housing unit. "Occupy" means the housing unit was the person's usual or permanent place of residence at the time of the first field contact. Household members include babies, lodgers, boarders, employed persons who live in the housing unit, and persons who usually live in the household but are away traveling or in a hospital. The household does not include (1) persons who are normally members of the household but who were away from home as college students or members of the armed forces at the time of the contact; (2) persons temporarily visiting with the household if they have a place of residence elsewhere; (3) persons who take their meals with the household but usually lodge or sleep elsewhere; (4) domestic employees or other persons employed by the household who do not sleep in the same housing unit; and (5) persons who are former members of the household, but have since become inmates of correction or penal institutions, mental institutions, homes for the aged or needy, homes or hospitals for the chronically ill or handicapped, nursing homes, convents or monasteries, or other places in which residents may remain for long periods of time. By definition, in the RECS, the number of households is the same as the number of occupied housing units. (See **Primary Residence**.)

Household Member: See **Household**.

Householder: The person (or one of the people) in whose name the home is owned or rented. If there is no lease or similar agreement, or if the person who owns the home or pays the rent does not live in the housing unit, the householder is the person responsible for paying the household bills, or whoever is generally in charge.

Housing Unit: A house, an apartment, a group of rooms, or a single room if it is either occupied, or intended for occupancy, as separate living quarters by a family, an individual, or a group of one to nine unrelated persons. Separate living quarters means the occupants (1) live and eat separately from other persons in the house or apartment and (2) have direct access from the outside of the building or through a common hall--that is, they can get to it without going through someone else's living quarters. Housing units do not include group quarters, such as prisons or nursing homes where ten or more unrelated persons live. Hotel and motel rooms are considered housing units if occupied as the usual or permanent place of residence. (See **Primary Residence**, **Group Quarters**, **Year-Round Units**, **Seasonal Units**, and **Migratory Units**.)

Humidifier: An appliance that adds moisture to the air (often used in the winter when the indoor air is very dry). It may be a portable unit or one attached to the heating system.

Humidity: The moisture content of air. Relative humidity is the ratio of the amount of water vapor actually present in the air to the greatest amount possible at the same temperature. (See **Dehumidifier** and **Humidifier**.)

Imputation: A statistical method used to fill in values for missing items, designed to minimize the bias of estimates. (See **Hot-Deck Imputation** and Appendix B, "Quality of the Data.")

Incandescent Lamp: The most common and among the least energy-efficient of all household lamps. A lamp that produces light by electrically heating a tungsten filament so that it glows and produces a soft, warm light. Because so much of the energy used is lost as heat, these are highly inefficient sources of light. Included in this category are the familiar household light bulbs which screw into sockets, as well as more energy-efficient incandescent bulbs, such as Tungsten Halogen (spotlights), Reflector or R-lamps (accent and task lighting), Parabolic Aluminized Reflector (PAR) lamps (flood and spot lighting), and Ellipsoidal Reflector (ER) lamps (recessed lighting).

Insulation: Any material or substance that provides a high resistance to the flow of heat from one surface to another. The different types include blanket or batt, foam, or loose fill, which are used to reduce heat transfer by conduction. Dead air space is an insulating medium in storm winds or multi-pane windows as it reduces passage of heat through conduction and convection. Reflective materials are used to reduce heat transfer by radiation. (See **Attic Insulation, Ceiling Insulation, Insulation Around Heating and/or Cooling Ducts**, and **Insulation Around Water Heater**, and **Insulation Around Hot-Water Pipes,** .)

Insulation Around Heating and/or Cooling Ducts: Extra insulation around the heating and/or cooling ducts, intended to reduce the loss of hot or cold air as it travels to different parts of the residence.

Insulation Around Hot-Water Pipes: Wrapping of insulating material around hot-water pipes to reduce the loss of heat through the pipes.

Insulation Around Water Heater: Blanket insulation wrapped around the water heater to reduce loss of heat. To qualify under this definition, this wrapping must be in addition to any insulation provided by the manufacturer.

Intensity: This is a method of adjusting either the amount of energy consumed or expenditures spent, for the effects of various housing unit and/or household characteristics, such as size of the housing unit, climate, and number of household members, to facilitate comparisons of energy across time, regions of the country, fuels, and housing units. (See **Conditional Energy Intensity**, **Conditional End-Use Intensity**, and **Intensity**.)

Jacuzzi: See **Hot Tub**.

Kerosene: A distilled product of oil or coal with the generic name kerosene and having properties similar to those of No. 1 fuel oil, used primarily in space heaters, cooking stoves, and water heaters. It is sometimes sold under names of "range oil," "stove oil," or "coal oil."

Kerosene Paid by Household: The household paid the fuel supplier directly for all household uses of kerosene, such as water heating and space heating. Bills paid by a third party are not counted as paid by the household. (See **Energy Source**.)

Kilowatthour: See **kWh**.

kWh (Kilowatthour): A unit of work or energy, measured as 1 kilowatt (1,000 watts) of power expended for 1 hour. One kWh is equivalent to 3,412 Btu. (See **Btu** and **Btu Conversion Factor**.)

Lamp: A term generally used to describe a manmade source of light. The term is often used when referring to a "bulb" or "tube." (See **Lights**.)

Lights: For the RECS, all of the light bulbs controlled by one switch were counted as one light. For example, a chandelier with multiple lights controlled by one switch is counted as one light. A floor lamp with two separate globes or bulbs controlled by two separate switches would be counted as two lights. Indoor and outdoor lights were counted if they were under the control of the householder. This would exclude lights in the hallway of multifamily buildings. **(**See **Floodlights**, **Fluorescent, High-Intensity Discharge**, and **Incandescent Lamps**.)

LIHEAP: See **Low-Income Home Energy Assistance Program**.

Liquefied Petroleum Gas (LPG): Any fuel gas supplied to a residence in liquid form, such as propane or butane. It is usually delivered by tank truck and stored near the residence in a tank or cylinder until used. Propane was the most common liquefied petroleum gas supplied to RECS households. (See **Energy Source**.)

Load-Control Program: A program in which the utility company offers a lower rate in return for having permission to turn off the air conditioner or water heater for short periods of time by remote control. This control allows the utility to reduce peak demand. (See **Peak Demand**.)

Low-Income Home Energy Assistance Program: The purpose of LIHEAP is to help pay home energy costs of low-income households. The Federal government provides the funds to the States that administer the program.

LPG Paid by Household: The household paid the fuel supplier directly for all household uses of LPG, such as water heating, space heating, air-conditioning, cooking, (other than cooking on an outdoor grill, which is excluded) and operating appliances. Bills paid by a third party are not counted as paid by the household. (See **Fuel**.)

LPG: See **Liquefied Petroleum Gas**.

Main: In this report, main means *Used Most*, as in "Main Space-Heating Fuel," which is the fuel used most for space heating. (See **Used Most**.)

Master-Metering: Measurement of electricity or natural gas consumption of several tenants or housing units using a single meter. That is, one meter measures the energy usage for several households collectively. RECS identifies units that have their energy use included in the rent and also identifies buildings with equipment that serves more than one housing unit, but does not specifically identify a building as "master metered."

Mean Indoor Temperature: Is the "usual" temperature. If different sections of the house are kept at different temperatures, the reported temperature is for the section where the people usually are. A thermostat setting is accepted if the temperature is not known.

Metric Conversion Factors: In this report, estimates are presented in customary U.S. units. Floorspace estimates may be converted to metric units by using this relationship: 1 square foot is approximately equal to .0929 square meters. Energy estimates may be converted to metric units by using this relationship: 1 Btu is approximately equal to 1,055 joules. One kilowatthour is exactly equal to 3,600,000 joules. One gigajoule is approximately 278 kilowatthours (kWh). (See **Btu** and **Btu Conversion Factors**.)

Metropolitan: See **Urban**.

Metropolitan Statistical Area (MSA): Areas defined by the U.S. Office of Management and Budget. An MSA is (1) a county or group of contiguous counties that contain at least one city of 50,000 inhabitants or more, or (2) an urbanized area of at least 50,000 inhabitants and a total MSA population of at least 100,000 (75,000 in New England). The contiguous counties are included in an MSA if, according to certain criteria, they are essentially metropolitan in character and are socially and economically integrated with the central city. In New England, MSA's consist of towns and cities, rather than counties. (See **Urban**, **Central City**, **Suburban**, and **Rural**.)

Microwave Oven: A household cooking appliance consisting of a compartment designed to cook or heat food by means of microwave energy. It may also have a browning coil and convection heating as additional features.

Migratory Unit: A housing unit intended for occupancy by migratory workers employed in farm work during the crop season. Usually excluded from the RECS, since it is not often the primary residence for more than 6 months of the year. (See **Primary Residence**.)

Mobile home: A housing unit built on a movable chassis and moved to the site. It may be placed on a permanent or temporary foundation and may contain one room or more. If rooms are added to the structure, it is considered a single-family housing unit. A manufactured house assembled on site is a single-family housing unit, not a mobile home.

MSA: See **Metropolitan Statistical Area (MSA)**.

Multifamily (2 to 4 units): A housing unit in a building with two to four housing units--a structure that is divided into living quarters for two, three, or four families or households and in which one household lives above another. This category also includes houses originally intended for occupancy by one family (or for some other use) that have since been converted to separate dwellings for two to four families. Typical arrangements in these types of living quarters are separate apartments downstairs and upstairs or one apartment on each of three or four floors.

Multifamily (5 or more units): A housing unit in a building with five or more housing units--a structure that contains living quarters for five or more households or families and in which one household lives above another.

Multistage Area Probability Sample: A sample design executed in stages with geographic "clusters" of sampling units selected at each stage. This procedure reduces survey expense while maintaining national coverage. (See Appendix A, "How the Survey Was Conducted.")

Natural Gas: Hydrocarbon gas (mostly methane) supplied as an energy source to individual buildings by pipelines from a central utility company. Natural gas does not refer to liquified petroleum gas or to privately owned gas wells operated by a building owner. (See **Energy Source**.)

Nonmetropolitan: See **Rural.**

Occupied Housing Unit: A unit in which someone was living as his or her usual or permanent place of residence when the first RECS field contact was made. (See **Housing Unit**.)

Origin: The primary racial background of the person considered to be the householder as determined by the respondent. Each respondent was asked, "Which of the groups on this exhibit best describes the householder?" The groups included: white, black or Negro, American Indian, Alaskan native, Asian, and Pacific Islander. (See **Hispanic Descent**.)

Outside Central City: See **Suburban**.

Oven: An appliance which is an enclosed compartment supplied with heat and used for cooking food. Toaster ovens are not considered ovens for this survey. For this survey, the range stove top or burners and the oven are considered two separate appliances, although they are often purchased as one appliance. (See **Appliances.**)

Owned/Rented: The relationship of a housing unit's occupants to the structure itself, not the land on which the structure is located. "Owned" means the owner or co-owner is a member of the household and the housing unit is either fully paid for or mortgaged. A household is classified "rented" even if the rent is paid by someone not living in the unit. Rent free means the unit is not owned or being bought and no money is paid or contracted for rent. Such units are usually provided in exchange for services rendered or as an allowance or favor from a relative or friend not living in the unit. Unless shown separately, rent-free households are grouped with rented households.

Ownership: See **Owned/Rented**.

Pay for Electricity or Gas for Air-Conditioning: Household uses electricity or gas for air-conditioning and pays directly to a utility company for that use.

Payment Method for Utilities: Method by which fuel suppliers or utility companies were paid for all electricity, natural gas, fuel oil, kerosene, or liquefied petroleum gas used by a household. Households that paid the utility company directly were classified in this survey as "all paid by household." Households that paid directly for at least one but not all of their fuels used and that has at least one fuel charge included in the rent were classified as "some paid, some included in rent." Households for which all fuels used were included in rent were classified as "all included in rent." Some households were classified as "other method," if they did not fall into any of those three categories. These are households for which fuel bills were paid by a social services agency or a relative, and households that paid for some of their fuels used but paid for other fuels through another arrangement.

Peak Demand: The maximum rate of energy consumption per unit time over a period of measurement.

Perceptions of Householders: Items in which the opinions of the respondent were being sought in order to gain insight into particular energy-related behavior. Technical definitions were not used as prompts by the interviewers, nor was the information provided verified by the interviewer. (See **Adequacy of Insulation**.)

Personal Computer: A microcomputer for producing written, programmed or coded material, playing games, or doing calculations; included as an appliance in RECS. Lap-top and notebook computers are excluded from this category.

Portable Electric Heater: A heater that uses electricity and that can be picked up and moved.

Portable Kerosene Heater: A heater that uses kerosene and that can be picked up and moved.

Portable Fan: Box fans, oscillating fans, table or floor fans, or other fans that can be moved.

Poverty Line: Low-income classifications to which certain households are assigned. "Below 100 percent of poverty" encompasses a group of households with incomes below the poverty level as defined by the U.S. Bureau of the Census and the Office of Management and Budget. "Below 125 percent of poverty" includes a group of households with incomes below 125 percent of the poverty level. These groups of the poor and near-poor represent alternative levels for defining poverty. The poverty line varies with the number of family members in the household and the income of the entire family. (See Appendix B, "Quality of the Data" and **Eligible for Federal Assistance**.)

Primary Electricity: A measurement of electricity that includes the approximate amount of energy used to generate electricity. To approximate the adjusted amount of electricity, the site-value of the electricity is multiplied by a factor of three. This conversion factor of three is a rough approximation of the Btu value of raw fuels used to generate electricity in a steam-generation power plant. In this report, electricity is represented as site energy. (See **Site Energy** and **Btu Conversion Factors**.)

Primary Residence: A **housing unit** in which a householder spends the largest part of the calendar year; it is the householder's usual or permanent residence. This would normally be a **year-round** housing unit. It would generally exclude **migratory** and **seasonal** units. However, if a seasonal unit happened to be occupied for half of the year by the householder, that unit would be considered the primary residence. (See **Housing Unit**, **Migratory Units**, **Seasonal Units**, **Year-Round Units**, and **Second Home**.)

Primary Sampling Unit (PSU): A sampling unit selected at the first stage in multistage area probability sampling. A PSU typically consists of one to several contiguous counties--for example, a metropolitan area with surrounding suburban counties. The approximately 3,100 counties and independent cities of the contiguous United States were grouped into about 1,786 PSU's by a procedure similar to the one used by the Census Bureau for its Current Population Survey. PSU's can be composed of one or more MSA's or can be composed of rural counties. (See **Metropolitan Statistical Area** and Appendix A, "How the Survey Was Conducted.")

Propane: See **Liquefied Petroleum Gas**.

PSU: See **Primary Sampling Unit (PSU)**.

Public Housing: Housing units owned by a local housing authority or other local public agency, such as a housing and redevelopment authority or a housing development agency. These organizations receive subsidies from the Federal or State government, but the local agency owns the property. To live in such a project, one must apply to the local housing authority.

Quadrillion: The quantity 1,000,000,000,000,000 = (10^{15}).

Race: See **Origin**.

Radiator: Space-heating equipment that transfers heat from steam or hot water to air by a combination of direct radiation, conduction, and convection. Typically, a radiator is a freestanding, cast-iron fixture exposed in the space it heats.

Range Top: The range burners or stove top and the oven are considered two separate appliances in this survey. Counted also with range tops are stand-alone "cook tops." (See **Appliances.**)

Rebate Program: A utility company-sponsored conservation program whereby the utility company returns a portion of the purchase price or cost when a more energy-efficient refrigerator, water heater, air conditioner, or other appliance is purchased.

Reflective Film: Transparent covering for glass that helps keep out heat from the sun.

Refrigeration Unit: Used to produce cooling in refrigerators, freezers, and air-conditioning equipment. In a typical refrigeration unit, electricity powers a motor that runs a pump to compress a refrigerant to maintain proper pressure. (A "refrigerant" is a substance that changes between liquid and gaseous states under desirable temperature and pressure conditions.) Heat from the compressed liquid is removed and discharged from the unit, and the refrigerant then evaporates when pressure is reduced. The refrigerant picks up heat as it evaporates and it returns to the compressor to repeat the cycle.

A few refrigeration units use gas (either natural gas or LPG) in an absorption process that does not use a compressor. The gas is burned to heat a chemical solution in which the refrigerant has been absorbed. Heating drives off the refrigerant which is later condensed. The condensed refrigerant evaporates by a release of pressure, and it picks up heat as it evaporates. The evaporated refrigerant is then absorbed back into the chemical solution, the heat is removed from the solution and discharged as waste heat, and the process repeats itself. By definition, refrigerators, freezers, and air-conditioning equipment all contain refrigeration units.

When one ton of ice melts in 24 hours, the rate is 12,000 Btu per hour. This rate has been officially designated as one ton of refrigeration and is the basis for rating all refrigeration machinery. (See **Air-Conditioning Equipment**.)

Refrigerator: A cabinet designed for cooling food at temperatures above 32 degrees Fahrenheit. Most also have a second compartment for freezing and storing frozen foods at temperatures of 8 degrees Fahrenheit or below. Refrigerators are one of the main end-use categories in RECS. (See **End Use** and Appendix D, "End-Use Estimation Methodology.")

Regression Imputation: A statistical technique for predicting the value of a numerical variable that is missing. The technique involves developing a regression equation that predicts the value of the missing variable based upon variables that are not missing or have already been imputed. A random error is usually added to the predicted value. The sum of the predicted value and the random error is used as the imputed value for the missing variable. (See **Imputation**.)

Relative Standard Error: See **RSE** or **Relative Standard Error**.

Renewable Energy: Energy obtained from sources that are essentially inexhaustible (unlike, for example, the fossil fuels, of which there is a finite supply). Renewable sources of energy include wood, waste, geothermal, wind, photovoltaic cells, and solar thermal energy.

Rent: See **Owned/Rented**.

Residential: Occupied housing units, including mobile homes, single-family housing units (attached and detached), and apartments. The definition of "occupied housing units" is the same as that used by the U.S. Bureau of the Census. (See **Household** and **Housing Unit**.)

Residential Building: A structure used primarily as a dwelling for one or more households.

Roof Insulation: Insulating materials placed underneath the roof or on the roof.

Room Air Conditioner: Air-conditioning units that typically fit into the window or wall and are designed to cool only one room. (See **Air-Conditioning**.)

Room Heater Burning Gas, Oil, Kerosene: Any of the following space-heating equipment: circulating heaters, convectors, radiant gas heaters, space heaters, or other nonportable room heaters that may or may not be connected to a flue, vent, or chimney.

Rooms: Subdivisions of a housing unit. Whole rooms are rooms such as living rooms, dining rooms, bedrooms, kitchens, lodgers' rooms, finished basements or attic rooms, recreation rooms, and permanently enclosed sun porches that are used year round. Rooms used for offices by a person living in the unit are included in this survey. "Finished" means that the ceiling and walls are covered with finishing materials.

Not considered to be rooms in this survey are bathrooms, halls, foyers, or vestibules, balconies, closets, alcoves, pantries, strip or pullman kitchens, laundry or furnace rooms, unfinished attics or basements, open porches, and unfinished space used for storage.

A partially divided room, such as a dinette next to a kitchen or a living room, is considered a separate room only if there is a partition from floor to ceiling--but not if the partition consists solely of shelves or cabinets. If a room is used by occupants of more than one unit, the room is included with the unit from which it is most easily reached. (See **Bedroom** and **Bathroom**.)

RSE Column Factor: An adjustment factor used to compute RSE's. For a survey estimate in a particular row and column of a table (that is, a particular "cell"), the approximate RSE is obtained by multiplying the RSE row factor by the RSE column factor for that cell. (See **RSE or Relative Standard Error**, **RSE Row Factor**, and the "Generalized Variances" section of Appendix B, "Quality of the Data.")

RSE or Relative Standard Error: A measure of the reliability or precision of a survey statistic. The Relative Standard Error, or RSE, is defined as the standard error of a survey estimate, expressed as a percent of the estimate. For example, an RSE of 10 percent means that the standard error is one-tenth as large as the survey estimate. The RSE is also known as the coefficient of variation. (See Appendix B, "Quality of the Data.")

RSE Row Factor: A factor used to compute RSE's. The row factor is equal to the geometric mean of the RSE's in a particular row of main tables. For a survey estimate in a particular row and column of a table (that is, a particular "cell"), the approximate RSE is obtained by multiplying the RSE row factor by the RSE column factor for that cell. (See **RSE or Relative Standard Error, RSE Column Factor**, and the "Generalized Variances" section of Appendix B, "Quality of the Data.")

Rural: Households not located within Metropolitan Statistical Areas as defined by the U.S. Office of Management and Budget. In previous RECS reports, rural areas were referred to as "nonmetropolitan" areas. Rural includes small towns. (See **Metropolitan Statistical Area (MSA)** and **Urban**.)

Sampling: The procedure used to select housing units for interview from the population of all residential housing units in the United States. (See **Multistage Area Probability Sample** and Appendix A, "How the Survey Was Conducted.")

Seasonal Energy Efficiency Ratio (SEER): Ratio of the cooling output divided by the power consumption. It is the Btu of cooling output during its normal annual usage divided by the total electric energy input in watt-hours during the same period. This is a measure of the cooling performance for rating central air conditioners and central heat pumps. The appliance standards require a minimum SEER of 10 for split system central air conditioners and for split system central heat pumps. These new standards took effect in 1992. The average heat pump or central air conditioner sold in 1986 had a SEER of about 9.

Seasonal Units: Housing units intended for occupancy at only certain seasons of the year. Seasonal units include units intended only for recreational use, such as beach cottages and hunting cabins. Seasonal units are not usually included in the RECS count of occupied housing units unless they are occupied for more than half of the year. (See **Primary Residence**.)

Secondary Heating Equipment: Space-heating equipment used less often (fewer days) than the main space-heating equipment. (See **Main**.)

Secondary Heating Fuel: Energy Sources or fuels used in secondary space-heating equipment.

Second Home: By definition, a second home is not the primary residence of a householder. Second homes are not included in the RECS count of occupied housing units. (See **Housing Units**, **Primary Residence**, and **Seasonal Units**.)

Setback Temperature Behavior: These data were derived from differences in the temperature settings reported by respondents for their daytime temperature when someone is at home, daytime temperature when no one is at home, and the temperature for sleeping hours (assumed to be nighttime). For example, if a respondent's reported temperature setting was lower when no one was at home than when someone was at home, respondents were assumed to be "setting" back the temperature.

Single-Family: A housing unit that provides living space for one household or family. The structure may be detached or attached to another unit. Attached houses are considered single-family houses as long as the house itself is not divided into more than one housing unit and has an independent outside entrance. A single-family house is contained within walls that go from the basement (or the ground floor, if there is no basement) to the roof. Townhouses, rowhouses, and duplexes are considered single-family attached housing units, as long as there is no household living above another one within the walls that go from the basement to the roof to separate the units. A mobile home with one or more rooms added is classified as a single-family home.

Site Energy: The Btu value of energy at the point it enters the home, sometimes referred to as "delivered" energy. (See **Primary Electricity** and **Btu Conversion Factors**.)

Solar Energy: The radiant energy of the sun which can be converted into other forms of energy, such as heat or electricity.

Spa: See **Hot Tub**.

Space Heating: The use of mechanical equipment (including wood stoves and active solar heating devices) to heat all, or part, of a building to at least 50 degrees Fahrenheit. The equipment could be the main space-heating equipment or secondary space-heating equipment. It does not include the use of energy to operate appliances (such as lights, televisions, and other appliances) that give off heat as a byproduct. (See **Heating Equipment, Heated,** and **Floorspace.**)

Space-Heating Equipment: See **Heating Equipment**.

Split System: When applied to electric air-conditioning equipment, it means a two-part system—an indoor unit and an outdoor unit. The indoor unit is an evaporator coil mounted in the indoor-circulating air system, and the outdoor unit is an air-cooled condensing unit containing an electric motor-driven compressor and condenser fan and fan motor.

Square Feet: See **Floorspace.**

Standard Price: Average price data were obtained from EIA surveys other than the RECS and used in the end-use regression equations for natural gas and electricity. These average prices were attached to each 1993 RECS household that used the respective fuel.

Steam or Hot-Water System: Either of two types of a central space-heating system that supplies steam or hot water to radiators, convectors, or pipes. The more common type supplies either steam or hot water to conventional radiators, baseboard radiators, convectors, heating pipes embedded in the walls or ceilings, or heating coils or equipment that are part of a combined heating/ventilating or heating/air-conditioning system. The other type supplies radiant heat through pipes that carry hot water and are inlaid in a concrete slab floor.

Stock: The total number of household appliances or housing units in use at a given time, including newly purchased ones and those in use for some time.

Stove: See **Heating Stove Burning Wood, Coal and Coke**, and **Cooking Stove.**

Structure: In RECS, one of four categories used to categorize the building in which the housing unit was located. The categories were single-family, multifamily (2-4 units), multifamily (5 or more units), and mobile home. (See **Single-Family**, **Multifamily (2 to 4 units), Multifamily (5 or more units)**, and **Mobile Home**.)

Submetered Data: End-use consumption data obtained for individual appliances when a recording device has been attached to the appliance to measure the amount of energy consumed by the appliance. (See **Metered Data**.)

Suburban: Those parts of the Metropolitan Statistical Areas that are not designated as central city. In previous RECS reports, suburban areas were referred to as "outside central city." (See **Central City**, **Metropolitan Statistical Areas**, **Rural,** and **Urban**.)

Swamp Cooler: See **Evaporative Cooler**.

Swimming Pool Heater: Optional heating equipment that heats the pool water to an acceptable level of comfort, usually 80 to 85 degrees Fahrenheit.

Swimming Pool Pump: All swimming pools reported in RECS were assumed to have an electric pump for filtering and circulating the water. (See **Swimming Pool Heater.**)

Temperature: In this report, respondents reported estimates of the indoor temperature. If different sections of the house are kept at different temperatures, the temperature requested is for the part of the house being utilized. If the heat is turned off upstairs during the day because the family is downstairs, the downstairs temperature is reported. If the respondent does not know the temperature, the thermostat setting is requested.

30-Year Average Degree-Days: Annual cooling or heating degree-days averaged over 30 years (from 1961 to 1990). 30-year average is considered "normal weather" for a region. (See **Cooling Degree-Days (CDD)** and **Heating Degree-Days (HDD)**.)

Total Floorspace: Floorspace summed or aggregated over all households in a category (such as households in the United States). In this survey, aggregate floorspace was estimated by multiplying each household's square footage by its weight, then summing over all sample households of interest to represent nationwide totals. (See **Floorspace** and **Weight**.)

Urban: Urban refers to a group of households located within Metropolitan Statistical Areas (MSAs) as defined by the U.S. Office of Management and Budget in 1993. For this report, urban is composed of central city and suburban areas. An MSA is (1) a county or group of contiguous counties that contain at least one city of 50,000 inhabitants or more, or (2) an urbanized area of at least 50,000 inhabitants and a total MSA population of at least 100,000 (75,000 in New England). The contiguous counties are included in an MSA if, according to certain criteria, they are essentially metropolitan in character and are socially and economically integrated with the central city. In New England, MSAs consist of towns and cities rather than counties. (See **Central City**, **Metropolitan Statistical Area, Suburban**, and **Rural.**)

Urban Status: Refers to geographic location of the households in relationship to Metropolitan Statistical Areas (MSA's). (See **Urban**, **Rural**, **Central City**, and **Suburban**.)

Used Most: For this report, used more days in the year. When two or more fuels are used for the same purpose (such as space heating or to heat a swimming pool), the fuel used more days is the one "used most." When the household uses more than one refrigerator, freezer, window/wall air-conditioning unit, or motor vehicle, the one used more days is the one "used most." If a decision could not be made on the basis of days used, respondents chose the one used more intensely.

Utilities Paid by Household: Householder directly pays an energy supplier for all uses of a fuel or fuel types used.

Vacant Housing Unit: A housing unit not occupied when the first 1993 RECS field contact was made. An occupied seasonal or migratory housing unit is classified as vacant at the time of the first contact if all of its occupants had a usual place of residence elsewhere.

Vehicles: For this survey, motorized vehicles used by U.S. households for personal transportation. Excluded are motorcycles, mopeds, large trucks, and buses. Included are automobiles, station wagons, passenger vans, cargo vans, motor homes, pickup trucks, and jeeps or similar vehicles. To be included, vehicles must be: (1) owned by members of the household, or (2) company cars not owned by household members but regularly available to household members for their personal use and ordinarily kept at home, or (3) rented or leased for 1 month or more.

Wall Insulation: Insulating materials within or on the walls between heated or air-conditioned areas of the building and unheated or unconditioned areas or the outside. (See **Insulation**.)

Water-Bed Heater: An appliance that uses an electric resistance coil to maintain the temperature of the water in a water bed at a comfortable level.

Water Heated in Furnace: Some furnaces provide hot water as well as heat the home. In these furnaces, water is heated by a coil that is part of the furnace; there is no separate hot water tank.

Water Heater: An automatically controlled, thermally insulated vessel designed for heating water and storing heated water at temperatures less than 180 degrees Fahrenheit .

Water Heater Blanket: See **Insulation Around Water Heater**.

Water Heater Size: Respondents were asked the size of their water heater tank. Three categories were provided, which were described by a range of gallon sizes: Small (30 gallons or less), Medium (31 to 49 gallons), Large (50 gallons or more). Households were not asked this question if they shared a water heater with other housing units. (See **Water Heated in Furnace**.)

Water Heating: Water heating is one of the five end-use categories in this report. It is defined as the use of energy to heat water for hot running water, as well as the use of energy to heat water on stoves and in auxiliary water-heating equipment for bathing, cleaning, and other noncooking applications of hot water. Not included in this category are the energy used to heat water for cooking and hot drinks or energy used to heat water for a swimming pool. Both of these are included in the appliance end-use category. (See **End Use**.)

Water-Heating Fuel: The fuel used to heat bath and wash water. Households that did not have running water in the home were also asked what fuel was used for heating water. The hot water may have been available anywhere in the same building as the respondent's living quarters--in a hallway, in a room used by several units in the building, in the basement, or in an enclosed porch--provided the respondent's household had access to it. (See **Water Heating.**)

Water-Heating Intensity: The amount of energy used per household member to heat water. (See **Water Heating** and the main text of this report for a detailed description of energy-intensity measures used.)

Weather Stripping: Any of several kinds of crack-filling material around any windows or doors to the outside used to reduce the passage of air and moisture around movable parts of a door or window. Weather stripping is available in strips or rolls of metal, vinyl, or foam rubber and can be applied on the inside or outside of a building.

Weight: The number of households in the United States that a particular sample unit represents. To estimate the total value of an attribute (such as floorspace) in the U.S. residential population as a whole, each sample household's value is multiplied by the household's weight. Summing the weighted sample values provides an estimate of the nationwide total. (See **Multistage Area Probability Sample**, **Total Floorspace** and Appendix B, "Quality of the Data.")

Well Pump: See **Electric Pump for Well Water.**

Whole-House Cooling Fan: A very large fan located in an upstairs ceiling or attic wall that pulls air through the house and out through the attic. The attic must have good air circulation--with fairly large vents--for such a fan to work well. (See **Appliances**.)

Window Fan: Fans located in the window. Does not include portable table or floor fans. (See **Appliances**.)

Windows: Any openings in the wall of a building for admission of light and/or air that are usually closed by casements or sashes containing transparent material (such as glass) and capable of being opened and shut. To be counted for RECS, the interior space must be heated; windows in unheated spaces, such as a garage or unheated basement, are not counted. Generally, each window that opens separately is counted as one window. Panes of glass in a large window are not counted separately unless they open separately. Double-hung slider windows count as one window. Windows (glass panels) in doors are not counted.

Wood-Burning Stove: See **Heating Stove**.

Wood Consumption: The amount of wood burned in the home at any time during the preceding 12 months in a fireplace, stove, or furnace, as reported by the respondent at the time of the interview. A cord of wood measures 4 feet by 4 feet by 8 feet and approximately 128 cubic feet. A third of a cord measures 16 inches by 4 feet by 8 feet. In order to enable respondents to be more accurate in reporting the amount of wood they burned, respondents were shown a drawing of a person holding an ax as a point of reference beside 1-, 5-, and 10-cord wood piles. A smaller scale copy of the 1-cord drawing is reproduced below. (See **Wood Conversion to Btu**.)

Wood Conversion to Btu: Converting cords of wood into a Btu equivalent is an imprecise procedure. The number of cords each household reports having burned is not exact, even with the more precise drawings provided, because the estimate requires the respondent to add up the use of wood over a 12-month period during which wood may have been added to the supply as well as removed. Besides errors of memory inherent in this task, the estimates are subject to problems in definition and perception of what a cord is. The nominal cord as delivered to a suburban residential buyer may differ from the dimensions of the standard cord. This difference is possible because wood is most often cut in lengths that are longer than what makes a third of a cord (16 inches) and shorter than what makes a half cord (24 inches).

In other cases, wood is bought or cut in unusual units (for example, pickup truck-load or trunk load). Finally, volume estimates are difficult to make when the wood is left in a pile instead of being stacked. Other factors that make it difficult to estimate the Btu value of the wood burned is that the amount of empty space between the stacked logs may vary from 12 to 40 percent of the volume. Moisture content may vary from 20 percent in dried wood to 50 percent in green wood. (Moisture reduces the useful Btu output because energy is used in driving off the moisture.) Finally, some tree species contain twice the Btu content of species with the lowest Btu value. Generally, hard woods have greater Btu value than soft woods. Wood was converted to Btu at the rate of 20 million Btu per cord, which is a rough average that takes all these factors into account. (See **Btu Conversion Factors**.)

Year of Construction: The year the structure was originally completed or the year any part of the structure was first occupied. For mobile homes, year of construction is the model year.

Year-Round Units: Housing units occupied or intended for occupancy at any time during the year. (See **Housing Unit** and **Seasonal Units**.)

Electronic Publishing System (EPUB)

EPUB is an electronic publishing system maintained by the Energy Information Administration (EIA) of the U.S. Department of Energy. EPUB allows the general public to electronically access selected energy data from many of EIA's statistical reports. The system is a menu-driven, bulletin-board-type system with extensive online help capabilities that can be accessed free of charge 24 hours a day by using a terminal or PC with an asynchronous modem. (EPUB will be taken down briefly at midnight for backup.)

PC users must provide the following information to their communications software in order to successfully access the EPUB system:

Communications Parameters:
Baud Rate: Up to 28,800 bps
Data Bits: 8; Stop Bits: 1
Parity: None; Duplex: Full
Terminal Type: ANSI, ANSI-BBS, VT100, etc.

Once communications software and/or hardware have been configured, EPUB can be accessed by dialing (202)586-2557. When a connection to the system has been made, some users may find that the menu-driven instructions and the online capabilities will provide enough information to effectively use EPUB. If needed, more extensive information may be found in the *EPUB User's Guide, which is available online from the EPUB system* or from:

National Energy Information Center, EI-231
Energy Information Administration
Forrestal Building, Room 1F-048
Washington, DC 20585
(202)586-8800
Internet E-Mail: INFOCTR@EIA.DOE.GOV
TTY: For people who are deaf or
hard of hearing: (202)586-1181
Hours: 9 a.m. to 5 p.m., M-F, eastern time

For **communications or technical assistance**, call *(202) 586-8959*, 8 a.m. to 5 p.m. eastern time, Monday through Friday. For **questions about the contents of EPUB reports and data**, call *(202)586-8800*, 9 a.m. to 5 p.m., Monday through Friday, eastern time.

Following is a listing of some of the data and reports that are provided on EPUB:

Heating fuel data
Updated the 2nd week of the month.

Oxygenates data
Updated approximately the 25th of the month.

Weekly Petroleum Status Report
Updated on Wednesdays (Thursdays in the event of a holiday) at 9 a.m.

Petroleum Supply Monthly
Updated on the 20th of the month.

Petroleum Marketing Monthly
Updated on the 20th of the month.

Natural Gas Monthly
Updated on the 20th of the month.

Weekly Coal Production
Updated on Fridays at 5 p.m.

Quarterly Coal Report
Updated 60 days after the end of the quarter.

Electric Power Monthly
Updated on the 1st of the month.

Monthly Energy Review
Updated the last week of the month.

Short-Term Energy Outlook
Updated 60 days after the end of the quarter.

Winter Fuels Report (October through April)
Updated every Thursday at 5 p.m.