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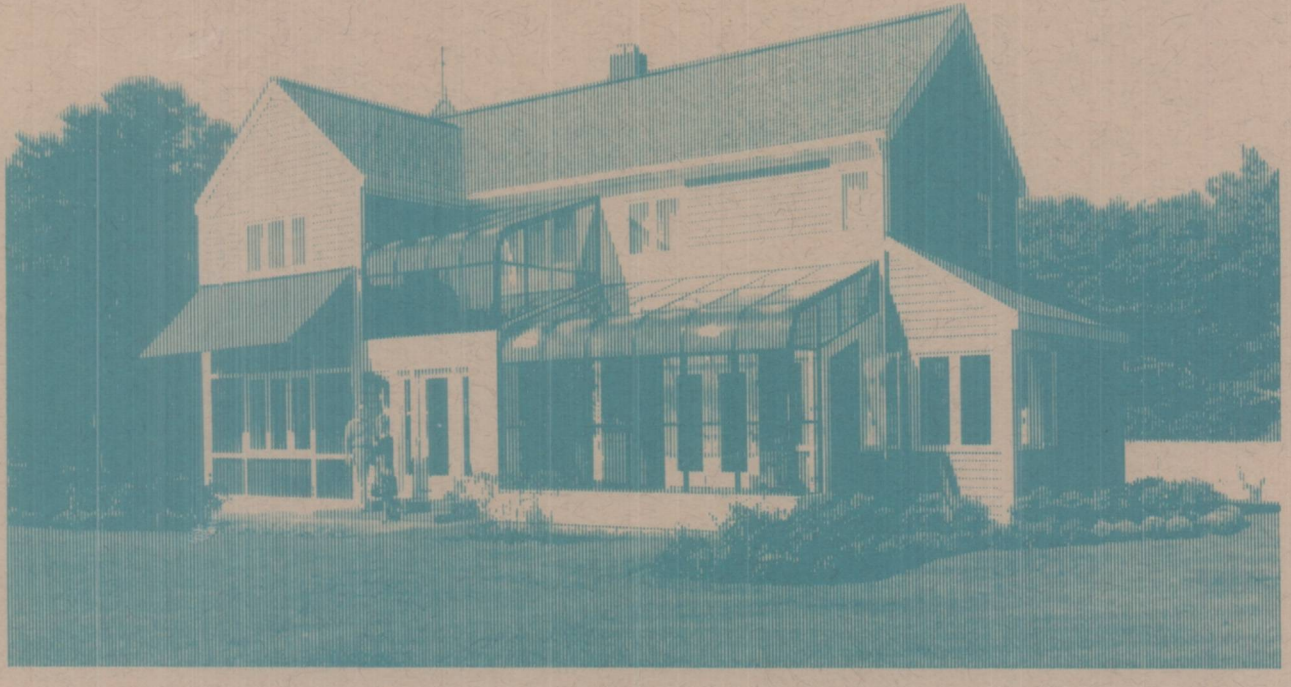
Residential Energy Consumption Survey:

Trends in Consumption and Expenditures, 1978-1984



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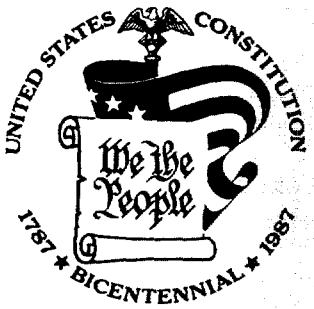

Residential Energy Consumption Survey:

Trends in Consumption and Expenditures, 1978-1984

Energy Information Administration
Office of Energy Markets and End Use
U.S. Department of Energy
Washington, DC 20585

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Executive Summary

This report is one of a series based on the Residential Energy Consumption Surveys (RECS) conducted by the Energy Information Administration (EIA) since 1978. This report is unique in that it provides an overview of the trends in energy consumption and expenditures per household measured by these surveys. The surveys, conducted in 1978 through 1982 and in 1984, provide an opportunity to examine how individual household consumption of energy has changed over this time period. The data in this report are by Census region and by four major energy sources: electricity, natural gas, fuel oil/kerosene, and liquefied petroleum gas (LPG).

The major findings of the report are:

- Energy consumption per household for the Nation has declined from 137.9 (±5.8) million Btu in 1978 to 104.7 (±3.0) in 1984; an overall decline of 33.2 (±6.5) million Btu.[1]

- The largest declines in consumption for the average household across the Nation occurred from 1978 to 1979, 1979 to 1980, and 1981 to 1982. These declines were all statistically significant at the 95-percent confidence level, while changes for the other time intervals were not statistically significant.

- Average consumption for each fuel declined, though the decline for average electricity consumption was barely significant.

- Among the four major fuels considered in the report (natural gas, electricity, fuel oil/kerosene, and LPG), electricity increased its share of average consumption per household, while the share for fuel oil/kerosene declined. The shares for natural gas and for LPG did not change significantly from 1978 to 1984.

- Among the four Census regions, the largest drop in average consumption per household occurred in the regions with the largest average consumption, the North Central and Northeast regions.

- Price increases for each fuel more than offset the declines in consumption, so in each RECS there was a statistically significant increase in expenditures per household compared with the previous RECS. Average expenditures per household for all fuels increased from $724 (±26) in 1978 to $1,123 (±27) in 1984 for the Nation.

- For most fuels, average expenditures per household generally increased each year. The major exception was fuel oil/kerosene for which expenditures peaked near 1980 (the precise year varied with the Census region) and then declined.

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[1] The numbers in parentheses are data for the 95-percent confidence level. A discussion of the use this interval and tests for statistical significance are given in the text and in Appendix A.

Executive Summary

This report also provides a detailed statistical discussion in Appendix A on the differences in the design and procedures followed in conducting the various RECS. It describes the appropriate statistical procedures to be followed in comparing data obtained in one survey year with data from another year. This discussion explains the differences in the appropriate standard errors to be used in comparing different survey years depending on whether the sample design for the two surveys was the same or different.

1. Introduction

This report contains data from the series of Residential Energy Consumption Surveys (RECS) that have been conducted from 1978 through 1984. This report examines the changes that have occurred in residential energy consumption and expenditures during this period. Since the RECS is used to collect data on energy consumption at the household level, the data are a rich source on differences in consumption by households of varying characteristics. Consequently, this report focuses on energy consumption and expenditures per household. These data are by Census region and by major energy sources. The four sources considered are natural gas, electricity, fuel oil/kerosene, and liquefied petroleum gas (LPG).

Households are not interested in energy for its own sake. Rather, energy is desired for the services it provides. Trends in energy consumption, therefore, reflect underlying changes in the demand for the services that energy provides, such as space heating, air-conditioning, water heating, cooking, and appliance usage. A number of factors may be responsible for the changes in consumption. Some factors are availability of different fuel types and their cost, while other factors may be unrelated to fuel prices.

Changes in the price of energy sources obviously have an impact upon household consumption. From 1978 to 1984, the prices of most energy products increased. This increase in the cost of energy exerted a downward pressure on consumption, since households, without a corresponding increase in income, would try to absorb some of the increased cost of energy by using less of it.

Other reasons for changes in consumption may be unrelated to the cost of energy. For example, if the number of members in a household changes, the energy consumption may change because the demand for some services provided by energy depends on the number of family members. The introduction of a new appliance may occur because of the convenience of the appliance, such as the speed of cooking in a microwave oven, without much consideration for the resulting change in energy consumption.

Data on two important factors that influence energy consumption are reported here: energy prices and weather. Weather conditions affect the amount of energy required for space conditioning and to a minor degree, other appliance usage. Regions with colder winters must consume more energy to maintain a given house at a given indoor temperature than if the house were located in a region with warmer winters. Similarly, very hot summers increase the demand for energy used for air conditioning. Although data on price and temperature are presented in this report, they are not necessarily the only, or even the most important, factors associated with consumption changes. Other factors which affect energy consumption are included as variables in Chapter 5, which contains detailed statistical data.

This report is intended for both the general and technical reader who is interested in recent trends in residential energy consumption and expenditures. Chapter 2 presents a detailed discussion of trends in average total consumption and expenditures per household for the four major energy sources. National and regional data are given for 1978 through 1984. Chapter 3 focuses on the trends for specific energy sources and their regional variations for 1978 through 1984. Chapter 4 examines the changes that occurred between 1978 and 1984 in the

Introduction

relative importance of each fuel to a household's total consumption and expenditures. This chapter presents data on the percentage of households using each fuel as the main heating fuel, the consumption of and expenditures for each fuel as a percentage of total consumption and expenditures per household, and the average expenditures per household for all fuels by main heating fuel. Chapter 5 presents detailed statistical data from the RECS for 1978, 1980, 1982, and 1984.

Additional background material is given in the appendices. Appendix A, Quality of the Data, focuses on the statistical considerations involved in making comparisons between different RECS. Appendices B and C provide maps of the U.S. Census regions and weather zones. Finally, related energy consumption publications are listed and a glossary of terms used in the text is given.

Statistical Confidence Intervals

The RECS data are obtained from surveys which are samples of the population rather than a census of the entire population. There is an inherent uncertainty with which any sample can represent the entire population due to the wide range of characteristics in the total population. If another sample were drawn, the results obtained would most likely be different from those obtained from the first survey.

Since a sample survey can only represent the population with a certain degree of accuracy, this imprecision must be taken into account in drawing conclusions from the data. This is particularly so in comparing results from surveys that have different sample designs. A brief discussion of the appropriate procedures to be followed in analyzing data from the various RECS is provided here. The reader who is interested in a more detailed and comprehensive discussion of the statistical procedures to be followed in studying trends in the RECS data is referred to Appendix A.

The degree to which the mean for a statistic measured from the sample comes close to the mean for the total population depends on the survey design, including the size of the sample population, and other factors. The sample variance or its square root, the standard error, measures the variability of the sample mean relative to the population mean for a given statistic.[2] Using this standard error, a confidence interval can be calculated that provides information about the value that would be obtained from a complete and accurate census of the population.

In this report, information on the sample variance is provided in the text by giving the value for 95-percent confidence interval.[3] The 95-percent confidence

---

[2]The variance data provided here reflect uncertainties due to sample design but may not reflect other sources of uncertainty.

[3]The 95-percent confidence interval is constructed by adding and subtracting 1.96 x (Standard Error) from the sample statistic.

interval has the following interpretation: if the survey were repeated with every possible sample, the true mean value of the statistic in question should fall within this confidence interval, calculated for each survey, for 95 percent of the surveys. The interval is given by citing the mean value of the statistic, followed by a value (in parentheses) which when added and subtracted from the mean gives the 95-percent confidence interval. For example, if it is stated that the average consumption per household for a specific fuel is 100 (±10) million Btu, the 95-percent confidence interval would be the range from 90 to 110 million Btu.

This report frequently discusses the differences between the average values for a statistic estimated in two different surveys. For example, it might be stated that average consumption in one survey was 100 (±5) million Btu and 120 (±6) million Btu in the second, for a difference of 20 (±8) million Btu. For this report, a difference will be considered statistically significant if the 95-percent confidence interval for the difference does not overlap 0. In this example, the confidence interval is 12 to 28 million Btu, which does not include 0, so the difference would be presumed to have statistical significance.

In several cases in this report, several statistics are compared at the same time. This occurs, for example, when the Census regions are ranked with respect to their energy consumption or expenditures. To account for the simultaneous inference in these cases, it is necessary to use a larger confidence interval. As discussed in Appendix A, a 99.167-percent confidence interval has been used whenever the four Census regions or the four major energy sources are compared.[4] A particular Census region will be noted as having the largest consumption, for example, if all three 99.167-percent confidence intervals for the differences between the consumption for the region in question and for the other three regions all lie above zero.

Comparing Data from Different RECS

The first two RECS, conducted in 1978 and 1979, were based on a survey sample design for a general purpose survey of households. RECS was fielded using this sample design until a design could be prepared that incorporated population characteristics important to energy: information on main heating fuel and outdoor temperature. A sample design incorporating these energy-related parameters was implemented in the 1980 survey. This design was not changed for the 1981 and 1982 surveys. For the 1984 survey, data from the 1980 Census were incorporated into the design to improve the precision of the survey. This resulted in a modest change in the survey design.

Comparing the data from these various survey years involves some interesting statistical considerations because of these sample design changes. The difficulty in comparing statistics obtained from one survey with those from another is that the appropriate standard error for comparing a given statistic measured in the two surveys depends on whether or not the sample designs used

[4] The 99.167-percent confidence interval is constructed by adding and subtracting 2.64 x (Standard Error) from the sample statistic.

for the two surveys were the same. If the surveys have a common sample design, the standard error will be different, generally lower for RECS, than when the designs are different. To understand why the standard errors differ in the two cases, it is useful to discuss briefly how the sampling is carried out.

The RECS sample design incorporates what is termed a multistage area probability sampling technique. First, the United States is divided into a number of geographical areas, and some of these areas--called primary sampling units (PSU's)--are chosen to be areas within which further sampling is carried out. Next, each PSU is divided into a number of secondary sampling units (SSU's) and one SSU is selected from each PSU. Finally, each SSU is divided into smaller units called segments, and from these segments the final units to be interviewed are selected.

For RECS, when the sample design is changed, a new set of PSU's is selected. When the design remains unchanged, the PSU's and SSU's remain the same. Some housing units are selected from different segments and some are selected from the same segments. There may also be housing units in common from the previous surveys. Because the segments within a SSU are in a relatively homogeneous area, the household characteristics, weather, availability and price of energy sources are not all that different from those selected in the previous survey. Consequently, the standard error involved in estimating changes from one RECS to another with a common sample design is relatively low, particularly when the two surveys are close together in time.

When the sample design is changed, all the PSU's are changed except for the large ones. Within a PSU, weather conditions along with energy prices and availability are likely to be similar. However, differences in housing stock and household characteristics will result in variations in energy consumption and expenditures within each PSU. The variability in weather conditions and energy prices will lead to additional variation in consumption and expenditures across PSU's. Consquently, the standard error that is involved in making comparisons between RECS based on different sample designs is generally much larger than the standard error between RECS with a common sample design.

A detailed description of the procedures to be followed for calculating standard errors for comparing surveys with a common sample design is given in Appendix A. In this report, these standard errors are called the dependent samples standard error. These standard errors are given in the tabular data provided in Chapters 2 and 3 on trends in consumption and expenditures per household. When the sample designs are different, the standard error for comparing results from the two surveys is called the independent samples standard error. This standard error is calculated from the formula:

$$(\text{Independent Samples Standard Error}_{a,b})^2 = (\text{Standard Error}_a)^2 + (\text{Standard Error}_b)^2$$

where 'a' and 'b' denote the two surveys being compared.

Introduction

The 1978 and 1979 surveys have one design, and the 1980 through 1984 surveys have another design. Consequently, the standard error for any statistic measured in 1978 or 1979 that is compared with its value measured in another year will have a relatively high standard error. It is useful to keep in mind that the standard error measures the limit to which a change could be measured. If there was a real, but small (i.e., smaller than width of the confidence interval) change between the 2 years, the RECS could not be used to provide an accurate estimate of the change.

Panel Surveys

Panel surveys, in which the same units are interviewed in successive surveys, are the most statistically reliable type of survey for measuring change. Since the same units are reinterviewed, the changes observed from the first survey will be changes that occurred for a common set of units. Changes that would be introduced by changing the sampled units will not be added to the survey results.

The design for the RECS introduced in 1980 includes a panel sample of households. One-half of the sample interviewed in one survey was reinterviewed in the survey two years later, with the other half of the new survey comprised of new housing units. This panel sample provides an opportunity to study change in more detail in the RECS. However, since only one-half the sample was reinterviewed for the panel survey, the inherent variance in the panel sample is larger than it would have been if the full sample had been reinterviewed. Consequently, whether or not the panel sample is the best vehicle for studying a specific change may depend on what statistic is being examined. These considerations are discussed in more detail in Appendix A. The tables in Chapters 2 and 3 provide the average consumption and expenditures for the panel samples for the two time periods over which households were reinterviewed: 1980 to 1982, and 1982 to 1984.

2. Consumption of and Expenditures for Major Energy Sources

This chapter examines the average total consumption and expenditures for the major energy sources, and in particular, their trends and regional variations over the 7-year period from 1978 through 1984.

For the United States and each of the four Census regions, results from the RECS indicate that there has been a general decline in the average household consumption of major energy sources from 1978 through 1984. During this period, the level of average consumption was persistently highest in the North Central and the Northeast regions (Figure 1).[5] The West and the South had much lower levels of consumption.

The size of these declines were directly correlated with the levels of consumption in 1978: the larger the consumption of a region, the more consumption there declined. However, the ranking of the regions remained unchanged. The 7-year change in consumption ranged from a decline of 50.2 (±14.0) million Btu in the North Central region to 13.7 (±11.2) in the South (Table 1). For the Nation as a whole, average consumption per household declined by 33.2 (±6.5) million Btu.

For the Nation, declines in consumption occurred in 1979, 1980, and 1982 (Table 1). Average consumption per household remained relatively fixed in 1981 and 1984 compared with the previous survey. The overall decline from 1978 to 1984 in total consumption per household of 33.2 (±6.5) million Btu is clearly statistically significant. Also, for the Nation, the consumption declines from 1978 to 1979, 1979 to 1980, and 1981 to 1982 are also statistically significant at the 95-percent confidence level. The nominal changes for 1980 to 1981 and 1982 to 1984 are not statistically significant.

Average consumption per household for the major energy sources and the corresponding standard error for each survey year are given in Table 1. The change in consumption from one survey to the next is also given along with the appropriate standard error. The changes in consumption in 1979, 1980, and 1982 were statistically significant. Average consumption data for the two different panel surveys are also given along with the dependent sample standard errors.[6]

The pattern of consumption changes was slightly more complex when individual regions are considered (Table 1). The Northeast region, for example, had the same pattern as did the Nation: apparent decreases from 1978 to 1979, from 1979 to 1980, and from 1981 to 1982; no change from 1980 to 1981; and a nominal increase from 1982 to 1984. However, the decrease from 1979 to 1980 and the increase from 1982 to 1984 were not statistically significant.

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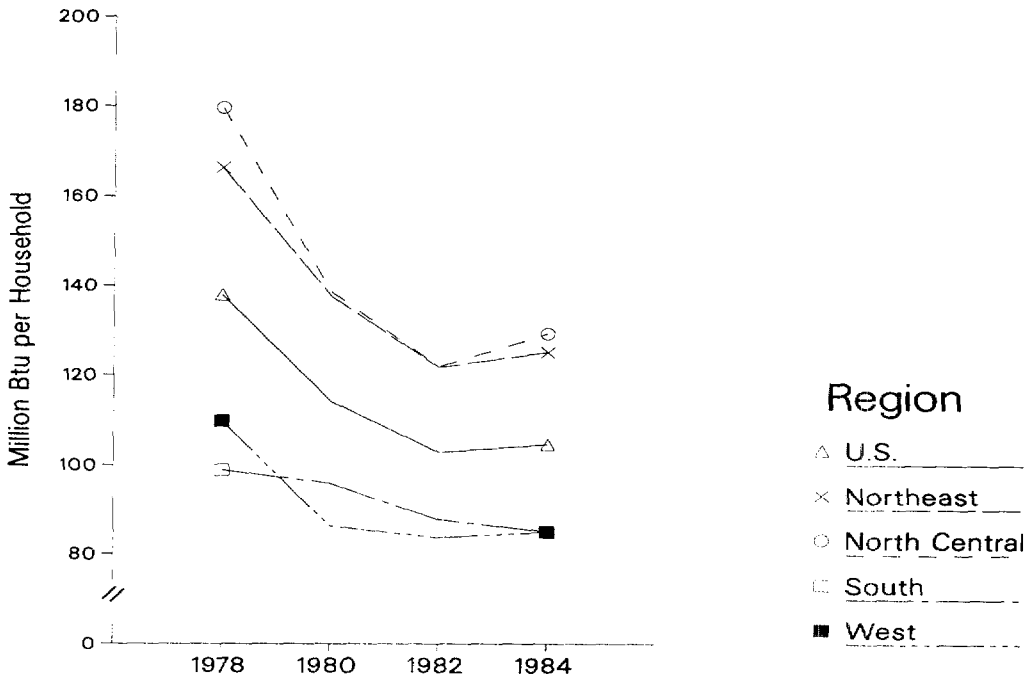
[5] The consumption figures shown in Figure 1 include electricity consumed at the home (site) but not energy input to the electricity production. This distinction is discussed later in this Chapter.

[6] Generally, the trends information from the panel data agree with the data from the full sample for the survey. Consequently, most of the discussion of trends to follow will be based on the full sample information.

Consumption of and Expenditures for Major Energy Sources

Figure 1. Average Total Consumption per Household of Major Fuels (Site Electricity) by Region, 1978,1980,1982, and 1984



Note: The major fuels are electricity, natural gas, fuel oil/kerosene, and liquefied petroleum gas.
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982 and 1984.

Consumption of and Expenditures for Major Energy Sources

Table 1. Average Consumption per Household of the Major Fuels (Site Electricity) for the United States and by Region, 1978-1982 and 1984 (Million Btu)

	1978	1979	1980	1981	1982	1984
			Total U.S.			
Full Sample						
Average Consumption	137.9	125.7	114.2	114.4	102.9	104.7
Standard Error	3.0	2.7	1.7	1.9	1.6	1.5
Change in Consumption[1]	-	-12.2	-11.5	0.3	-11.5	1.8
Dependent Sample Standard Error ..	-	1.7	-	1.4	1.4	1.1
Independent Sample Standard Error ..	-	-	3.2	-	-	-
Panel 1980-1982						
Average Consumption	-	-	114.9	-	102.4	-
Standard Error	-	-	2.2	-	2.0	-
Change in Consumption[2]	-	-	-	-	-12.5	-
Dependent Sample Standard Error ..	-	-	-	-	1.3	-
Panel 1982-1984						
Average Consumption	-	-	-	-	103.5	105.1
Standard Error	-	-	-	-	1.8	2.1
Change in Consumption[2]	-	-	-	-	-	1.6
Dependent Sample Standard Error ..	-	-	-	-	-	1.1

See footnotes at end of table.

Table 1. Average Consumption per Household of the Major Fuels (Site Electricity) for the United States and by Region, 1978-1982 and 1984 (Continued) (Million Btu)

	1978	1979	1980	1981	1982	1984
			Northeast			
Full Sample						
Average Consumption	166.3	144.8	137.7	137.7	121.7	125.2
Standard Error	7.0	8.7	3.4	4.9	3.6	3.1
Change in Consumption[1]	-	-21.5	-7.1	0.0	-16.0	3.6
Dependent Sample Standard Error ..	-	3.5	-	2.7	2.5	2.8
Independent Sample Standard Error ..	-	-	9.4	-	-	-
Panel 1980-1982						
Average Consumption	-	-	140.0	-	118.4	-
Standard Error	-	-	3.9	-	4.4	-
Change in Consumption[2]	-	-	-	-	-12.5	-
Dependent Sample Standard Error ..	-	-	-	-	1.9	-
Panel 1982-1984						
Average Consumption	-	-	-	-	124.8	122.8
Standard Error	-	-	-	-	4.1	5.3
Change in Consumption[2]	-	-	-	-		-1.9
Dependent Sample Standard Error ..	-	-	-	-		2.9

See footnotes at end of table.

Table 1. Average Consumption per Household of the Major Fuels (Site Electricity) for the United States and by Region, 1978-1982 and 1984 (Continued) (Million Btu)

	1978	1979	1980	1981	1982	1984
			North Central			
Full Sample						
Average Consumption	179.6	167.9	138.7	146.7	121.9	129.4
Standard Error	6.6	5.6	3.2	4.3	3.0	2.7
Change in Consumption[1]	-	-11.7	-29.2	8.0	-24.8	7.5
Dependent Sample Standard Error ..	-	4.2	-	4.7	4.4	3.0
Independent Sample Standard Error ..	-	-	6.4	-	-	-
Panel 1980-1982						
Average Consumption	-	-	135.1	-	119.9	-
Standard Error	-	-	5.4	-	4.8	-
Change in Consumption[2]	-	-	-	-	-15.3	-
Dependent Sample Standard Error ..	-	-	-	-	3.1	-
Panel 1982-1984						
Average Consumption	-	-	-	-	123.9	132.7
Standard Error	-	-	-	-	3.7	3.6
Change in Consumption[2]	-	-	-	-	-	8.8
Dependent Sample Standard Error ..	-	-	-	-	-	2.4

See footnotes at end of table.

Table 1. Average Consumption per Household of the Major Fuels (Site Electricity) for the United States and by Region, 1978-1982 and 1984 (Continued) (Million Btu)

	1978	1979	1980	1981	1982	1984
			South			
Full Sample						
Average Consumption	98.9	92.4	96.0	89.0	87.8	85.1
Standard Error	4.7	3.3	3.4	3.7	3.5	3.3
Change in Consumption[1]	-	-6.5	3.6	-7.1	-1.1	-2.7
Dependent Sample Standard Error ..	-	2.5	-	1.6	1.9	2.0
Independent Sample Standard Error ..	-	-	4.7	-	-	-
Panel 1980-1982						
Average Consumption	-	-	98.5	-	88.3	-
Standard Error	-	-	4.0	-	4.0	-
Change in Consumption[2]	-	-	-	-	-10.2	-
Dependent Sample Standard Error ..	-	-	-	-	2.2	-
Panel 1982-1984						
Average Consumption	-	-	-	-	87.4	86.3
Standard Error	-	-	-	-	3.7	4.2
Change in Consumption[2]	-	-	-	-		-1.1
Dependent Sample Standard Error ..	-	-	-	-	-	1.6

See footnotes at end of table.

Table 1. Average Consumption per Household of the Major Fuels (Site Electricity) for the United States and by Region, 1978-1982 and 1984 (Continued) (Million Btu)

	1978	1979	1980	1981	1982	1984
			West			
Full Sample						
Average Consumption	109.8	100.1	86.3	90.1	83.7	85.0
Standard Error	5.6	4.0	1.9	2.3	2.1	2.3
Change in Consumption[1]	-	9.7	13.8	3.8	-6.4	1.3
Dependent Sample Standard Error ..	-	3.6	-	1.9	1.7	1.9
Independent Sample Standard Error ..	-	-	4.4	-	-	-
Panel 1980-1982						
Average Consumption	-	-	88.8	-	86.0	-
Standard Error	-	-	2.8	-	2.7	-
Change in Consumption[2]	-	-	-	-	-2.7	-
Dependent Sample Standard Error ..	-	-	-	-	1.3	-
Panel 1982-1984						
Average Consumption	-	-	-	-	81.6	83.1
Standard Error	-	-	-	-	3.5	3.5
Change in Consumption[2]	-	-	-	-	-	1.5
Dependent Sample Standard Error ..	-	-	-	-	-	1.5

[1] The change in consumption is from the preceding survey year to the year in the column. The change is for a 1-year interval for all years except for 1984 where the change is for the 2-year interval from 1982 to 1984.

[2] The change in consumption is for the 2-year period for the panel sample only.

Note: Numbers may not add to totals because of independent rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1979, 1980, 1982, and 1984.

The North Central region had a similar pattern of apparent changes in consumption, but differed somewhat in whether or not the observed changes were statistically significant. Here, all of the observed declines were significant, and the increase from 1982 to 1984 was also significant.

In the South, the overall decline from 1978 to 1984 of 13.7 (±11.2) million Btu was barely significant statistically. Declines in consumption from 1978 to 1979 and from 1980 to 1981 were statistically significant, but none of the changes for the other years were significant.

In the West, the consumption declines from 1978 to 1979, 1979 to 1980, and 1981 to 1982 were all statistically significant, while the apparent changes for the other years were not. The overall decline from 1978 to 1984 was 24.8 (±6.0) million Btu in the West.

Associated with the decline in consumption was an increase in the price of the major energy sources used in the home (Figure 2). Averaged over all households that used each source, prices increased steadily from 1978 to 1984 for every energy source except for fuel oil/kerosene. The price of fuel oil/kerosene increased each year through 1981, declined slightly in 1982 and fell further in 1984. Despite these price declines, the overall price of fuel oil/kerosene had a net increase from 1978 through 1984. This increase was, in percentage terms, between the increase for natural gas and that for electricity. The prices for fuel oil/kerosene and LPG increased by around 95 percent from 1978 through 1984, while electricity prices increased about 80 percent and natural gas prices by almost 120 percent.

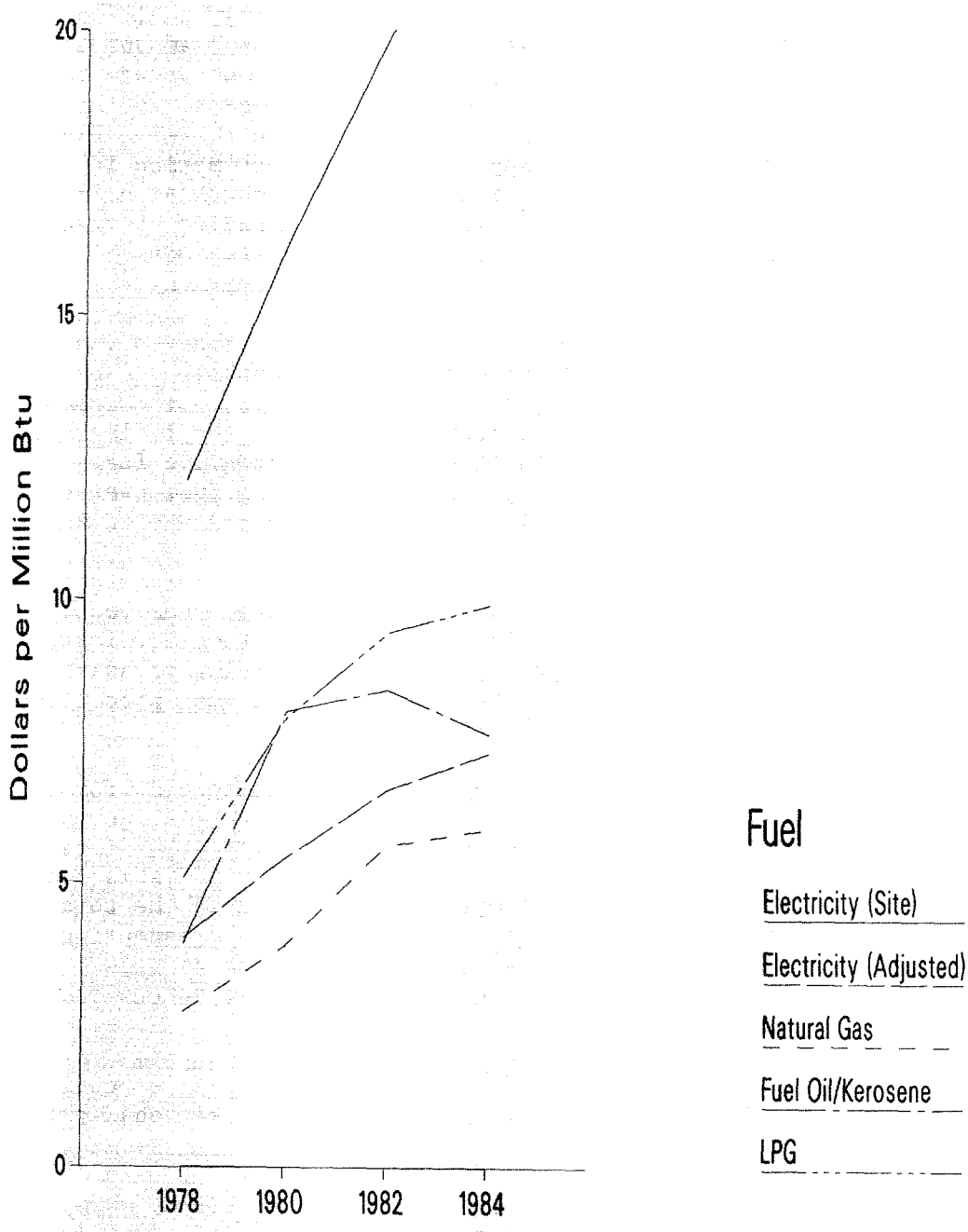
Comparing the price or consumption of various fuels assumes that the quantities of different fuels consumed are comparable. That is, that 1 Btu of electricity is the equivalent of 1 Btu of natural gas, for example. Such an assumption has implicitly been made in combining the consumption of each fuel to get total consumption (Figure 1 and Table 1).

Since households are primarily interested in the services provided by energy, the most useful measure of a fuel is how much of a fuel is needed to provide a given level of service--for example, the amount of fuel required to maintain a home at a given temperature for a particular outdoor temperature. For space heating, the type of equipment that is used to provide the heat will determine how much of the fuel will be used to heat the home. If an electric resistance heater is used for home heating, 1 Btu of electricity consumed will provide very close to 1 Btu of heat energy for heating the home. If an electrical heat pump is used, 1 Btu of electricity consumed will produce more than 1 Btu of energy for home heating. However, fossil fuels must be burned in a furnace in which there is always some heat loss. Therefore, 1 Btu of fuel consumed will produce less than 1 Btu of heating energy for the home.

Electricity can be used so effectively in the home because it has been converted into a more efficient form at the site of generation. Electricity is unique in that it is a derived source of energy obtained by converting another source of energy to a more useful form. When fossil fuels are consumed by utilities to generate electricity, it takes close to 3 Btu of fossil fuel to

Consumption of and Expenditures for Major Energy Sources

Figure 2. Prices of Major Fuels Sold to Residences in the United States, 1978,1980,1982, and 1984



Note: The adjusted price of electricity incorporates the approximate Btu values of the fuels used to produce the electricity. Unadjusted price is divided by 3.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

provide one Btu of electricity consumed in the home.[7] This is one reason why the price per Btu of electricity is higher than the price per Btu of other fuels.

Because of this inherent difference between electricity consumed in the home and other fuels purchased for consumption at the site, some energy analysts prefer to incorporate the total embodied energy that constitutes a given amount of electricity when converting site consumption from kilowatthours (kWh) to Btu. This is done by multiplying the quantity of electricity consumed in the home by a factor of 3 when converting to Btu. In this report, when the electricity has been adjusted in this manner, the resulting electricity consumption is termed "adjusted electricity." When the consumption is a strict conversion of kWh into Btu, the consumption is called "site electricity." The detailed statistics tables in Chapter 5 provide data on total fuel consumption for both site-electricity consumption and adjusted-electricity consumption.

The differences in the nature of the fuels are reflected in their price (Figure 2).[8] The average price for site electricity paid by residential consumers is two to three times as high as the price for the other fuels, on the common basis of dollars per Btu. This higher price reflects the cost of the fuels that were consumed to produce electricity. LPG was the next most expensive fuel, followed by fuel oil/kerosene and by natural gas, the least expensive fuel over the period. (The price of adjusted electricity is between the price of natural gas and fuel oil/kerosene.)

When adjusted-electricity values are included in total energy consumed by the household, the average total values are higher than when site-electricity values are used (Figure 3). The magnitude of the effect of converting to adjusted electricity varies from one region to another, depending on what proportion of the energy consumed in the region was electricity.

The South had the highest consumption of electricity per household from 1978 through 1984, while the Northeast was the least dependent on this energy source. Because of the regional differences in the use of electricity, the differences among the regions in average total consumption for the major fuels is less pronounced when adjusted-electricity consumption is included in the total. In 1978, the North Central and Northeast regions had an average consumption that was statistically significantly larger than that in the South and West. However, in 1984, consumption in the four regions was similar enough that there was not a statistically significant ranking among them.

Because prices increased more than consumption declined, average expenditures for all fuels increased steadily in each region (Figure 4). Regional patterns

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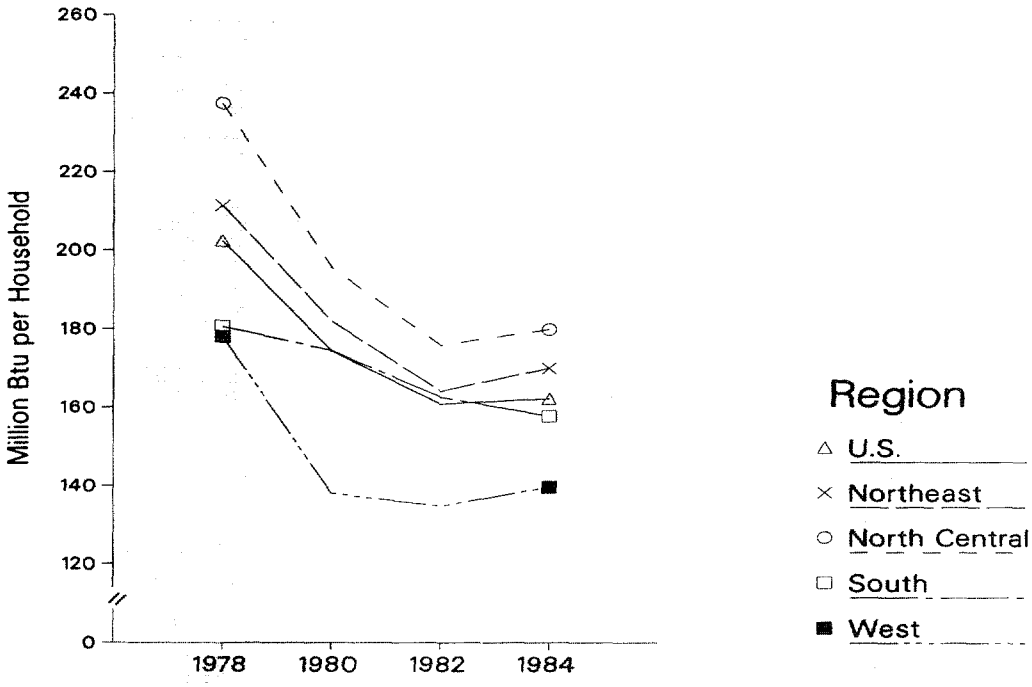
[7] Annual Energy Review, 1985 Energy Information Administration, DOE/EIA-0384(85).

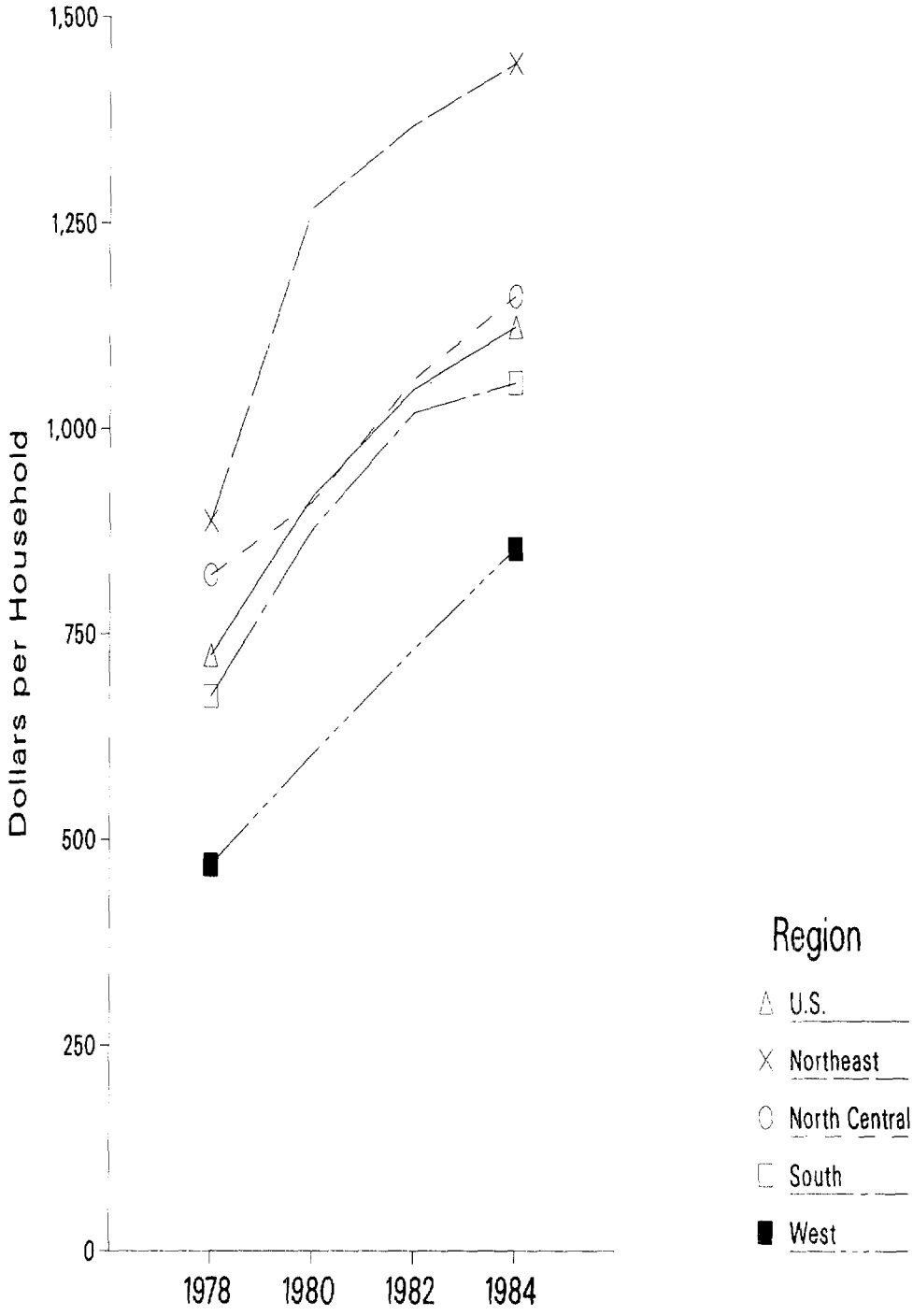
[8] The price and expenditures data presented in this report are in current dollars. They have not been converted to constant dollars by adjusting for inflation.

Figure 3. Average Total Consumption per Household of Major Fuels (Adjusted Electricity) by Region, 1978,1980,1982, and 1984



Note: Adjusted Electricity is site electricity times 3. See Glossary.
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

Figure 4. Average Total Expenditures per Household for Major Fuels by Region, 1978,1980,1982, and 1984



Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

for expenditures differed from those for consumption because (1) the mix of fuels used varied by region and (2) households in the different regions paid different prices for their fuels. The highest average level of expenditures among the four regions was in the Northeast.

The North Central and South regions had intermediate levels of expenditures. Because of a smaller increase in prices in the early 1980's in the North Central region, average expenditures in the North Central and the South approached each other in the mid-part of the 1978 through 1984 period. However, they diverged again by 1984. The West had by far the lowest level of expenditures of all the regions.

One significant influence on the average expenditures for the major fuels within a region is the price of the fuels used in the region. Households in the Northeast paid the highest prices for almost all the fuels they used. That region is also heavily dependent on fuel oil--a relatively expensive fuel for many of the years from 1978 through 1984--for space heating. Households in the West, on the other hand, paid the lowest prices among the regions for the fuels--electricity and natural gas--that were used most heavily in the region.

For the Nation from 1978 to 1984, average expenditures per household for major energy sources increased by $399 (±38), from $724 (±26) to $1,123 (±27) (Table 2). Expenditures increased every year over the 7-year period. The largest increase, $106 (±20), occurred from 1980 to 1981, a period in which consumption remained essentially constant. The smallest increase, $26 (±25), occurred from 1981 to 1982, when consumption showed a large decline. The panel data confirm the increases in expenditures.

The pattern of changes in expenditures within each region is generally the same as for the Nation, although there are some differences. For example, in the Northeast, the large decline in consumption from 1981 to 1982 led to a decline in average expenditures of $57 (±55) which was barely significant statistically. By 1984, however, expenditures had risen above their 1981 levels. For the North Central region, the nominal decline in expenditures from 1979 to 1980 was not statistically signifcant. The South experienced steady increases in expenditures, as did the West. The apparent increases from 1982 to 1984 for the South and for 1981 to 1982 in the West were not statistically significant.

One important influence on the consumption levels of the different regions is the amount of energy consumed for space conditioning--for heating the house in the winter and cooling (air conditioning) it in the summer. The amount of energy required for space conditioning the home depends on the climate of the region.

Warmer winters--as indicated by a decrease in heating degree-days (HDD)--mean less need for home-heating fuels. Cooler summers--as indicated by a decrease in cooling degree-days (CDD)--mean less need for air conditioning. Although the need for air conditioning is affected by humidity as well as by temperature, CDD are used as the most readily available measurement for assessing air conditioning requirements. When summers are warmer, air

Table 2. Average Expenditures per Household for the Major Fuels (Site Electricity) for the United States and by Region, 1978-1982 and 1984 (Dollars)

	1978	1979	1980	1981	1982	1984
			Total U.S.			
Full Sample						
Average Expenditures	724	815	916	1022	1048	1123
Standard Error	13	18	12	13	14	14
Change in Expenditures[1] ...	-	91	101	106	26	76
Dependent Sample Standard Error ..	-	11	-	10	13	11
Independent Sample Standard Error ..	-	-	22	-	-	-
Panel 1980-1982						
Average Expenditures	-	-	919	-	1043	-
Standard Error	-	-	16	-	19	-
Change in Expenditures[2] ...	-	-	-	-	123	-
Dependent Sample Standard Error ..	-	-	-	-	13	-
Panel 1982-1984						
Average Expenditures	-	-	-	-	1053	1132
Standard Error	-	-	-	-	16	20
Change in Expenditures[2] ...	-	-	-	-	-	79
Dependent Sample Standard Error ..	-	-	-	-	-	11

See footnotes at end of table.

Table 2. Average Expenditures per Household for the Major Fuels (Site Electricity) for the United States and by Region, 1978-1982 and 1984 (Continued) (Dollars)

	1978	1979	1980	1981	1982	1984
			Northeast			
Full Sample						
Average Expenditures	887	1033	1268	1426	1369	1443
Standard Error	31	57	28	34	32	32
Change in Expenditures[1] ...	-	146	235	159	-57	74
Dependent Sample Standard Error ..	-	33	-	27	28	25
Independent Sample Standard Error ..	-	-	65	-	-	-
Panel 1980-1982						
Average Expenditures	-	-	1269	-	1325	-
Standard Error	-	-	33	-	41	-
Change in Expenditures[2] ...	-	-	-	-	56	-
Dependent Sample Standard Error ..	-	-	-	-	25	-
Panel 1982-1984						
Average Expenditures[2] ...	-	-	-	-	1411	1455
Standard Error	-	-	-	-	33	43
Change in Expenditures	-	-	-	-	-	79
Dependent Sample Standard Error ..	-	-	-	-	-	33

See footnotes at end of table.

Table 2. Average Expenditures per Household for the Major Fuels (Site Electricity) for the United States and by Region, 1978-1982 and 1984 (Continued) (Dollars)

	1978	1979	1980	1981	1982	1984
			North Central			
Full Sample						
Average Expenditures	821	924	910	1042	1060	1160
Standard Error	29	40	19	30	28	29
Change in Expenditures[1] ...	-	103	-14	132	18	100
Dependent Sample Standard Error ..	-	18	-	24	31	24
Independent Sample Standard Error ..	-	-	44	-	-	-
Panel 1980-1982						
Average Expenditures	-	-	896	-	1066	-
Standard Error	-	-	25	-	35	-
Change in Expenditures[2] ...	-	-	-	-	170	-
Dependent Sample Standard Error ..	-	-	-	-	29	-
Panel 1982-1984						
Average Expenditures	-	-	-	-	1054	1191
Standard Error	-	-	-	-	35	37
Change in Expenditures[2] ...	-	-	-	-	-	137
Dependent Sample Standard Error ..	-	-	-	-	-	19

See footnotes at end of table.

Table 2. Average Expenditures per Household for the Major Fuels (Site Electricity) for the United States and by Region, 1978-1982 and 1984 (Continued) (Dollars)

	1978	1979	1980	1981	1982	1984
			South			
Full Sample						
Average Expenditures	674	744	876	922	1019	1055
Standard Error	23	20	29	25	33	28
Change in Expenditures[1] ...	-	70	132	46	97	36
Dependent Sample Standard Error ..	-	16	-	17	21	24
Independent Sample Standard Error ..	-	-	36	-	-	-
Panel 1980-1982						
Average Expenditures	-	-	891	-	1020	-
Standard Error	-	-	39	-	43	-
Change in Expenditures[2] ...	-	-	-	-	129	-
Dependent Sample Standard Error ..	-	-	-	-	28	-
Panel 1982-1984						
Average Expenditures	-	-	-	-	1018	1061
Standard Error	-	-	-	-	29	41
Change in Expenditures[2] ...	-	-	-	-	-	43
Dependent Sample Standard Error ..	-	-	-	-	-	20

See footnotes at end of table.

Table 2. Average Expenditures per Household for the Major Fuels (Site Electricity) for the United States and by Region, 1978-1982 and 1984 (Continued) (Dollars)

	1978	1979	1980	1981	1982	1984
			West			
Full Sample						
Average Expenditures	469	527	603	720	731	852
Standard Error	20	22	15	21	16	23
Change in Expenditures[1] ...	-	58	76	117	11	121
Dependent Sample Standard Error ..	-	20	-	15	13	18
Independent Sample Standard Error ..	-	-	27	-	-	-
Panel 1980-1982						
Average Expenditures	-	-	617	-	741	-
Standard Error	-	-	23	-	21	-
Change in Expenditures[2] ...	-	-	-	-	124	-
Dependent Sample Standard Error ..	-	-	-	-	10	-
Panel 1982-1984						
Average Expenditures	-	-	-	-	722	832
Standard Error	-	-	-	-	30	34
Change in Expenditures[2] ...	-	-	-	-	-	110
Dependent Sample Standard Error ..	-	-	-	-	-	14

[1]The change in expenditures is from the preceding survey year to the year in the column. The change is for a 1-year interval for all years except for 1984 where the change is for the 2-year interval from 1982 to 1984.

[2]The change in expenditures is for the 2-year period for the panel sample only.

Note: Numbers may not add to totals because of independent rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1979, 1980, 1982, and 1984.

conditioning is used more, with an attendant inevitable increase in the use of electricity (the primary source of energy for cooling).

During the 7 years covered by this report, a slight winter warming trend occurred in all regions except the South, where heating has been less important than air conditioning (Figure 5).[9] In the South, increasingly temperate summers reduced the need to use electricity to air-condition homes. Consequently, weather changes lowered the demand for space conditioning in the later years of the period. The more temperate weather contributed to the decline in energy consumption between 1978 and 1984.

The North Central region had the most severe winters from 1978 through 1984, which is consistent with its position as the region with the highest average consumption of energy (Figure 5). The West, on the other hand, had both mild winters and mild summers, so it required less energy for space conditioning than the other three regions. The Northeast had winters almost as severe as the North Central region did; the South had the hottest summers. More energy was required for heating in the Northeast than for cooling in the South, so the Northeast region had the second highest level of energy consumption.

Although this report does not attempt to account for the changes in energy consumption described here, it is useful to note the relative influence of two important factors that have been discussed in this chapter. An increase in energy prices will induce consumers to lower their consumption because of the increased budget burden of the higher expenditures resulting from the higher prices. The larger the price increase, the larger the pressure on households to lower their consumption. The fact that the prices essentially doubled from 1978 through 1984 means that the price increases put a severe pressure on households to lower their consumption.

On the other hand, changes in weather will have a similar effect. A colder winter will increase the amount of energy needed to maintain a constant temperature, which will increase expenditures for energy. This increase in expenditures will put pressure on households to lower their thermostat settings

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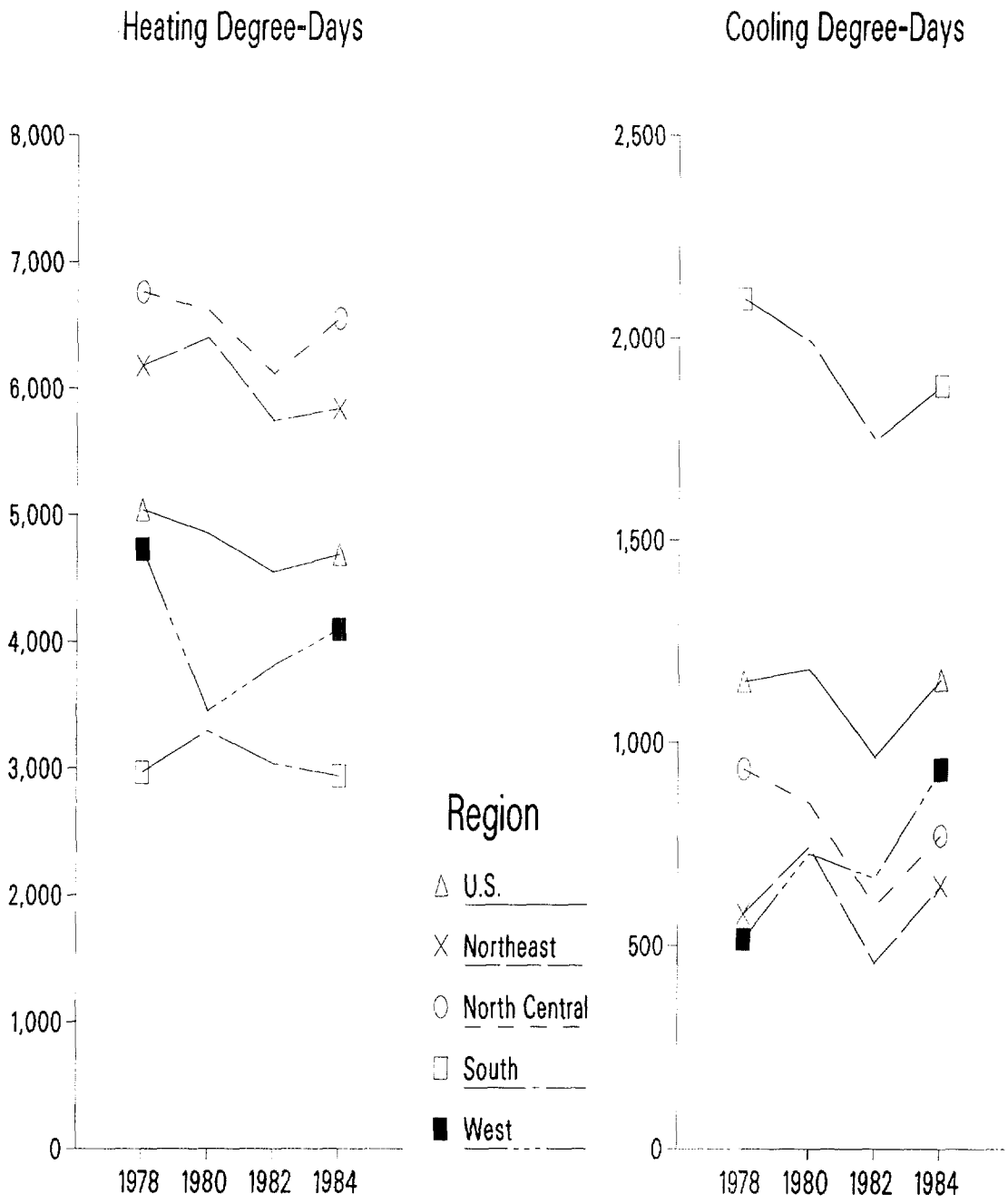
[9] The number of HDD depends on the outdoor temperature as well as the thermostat setting in the house, which is related to the reference temperature. The HDD data presented here are based on a fixed reference temperature of 65 degrees Fahrenheit, so the only reason for a change in HDD would be a change in outdoor temperature. However, households might lower their thermostat settings either in response to an increase in the price of the heating fuel or because of unusually cold weather. If thermostat settings are lowered, a revised reference temperature should be used to determine the number of HDD. In the early RECS, the data collected were insufficient to determine whether or not changes in thermostat settings were significant. Because of the possible change in HDD caused by changed thermostat settings, data on HDD that are based on a fixed reference temperature are not uniquely related to energy requirements for space heating.

Figure 5. Annual Heating and Cooling Degree-Days by Region, 1978,1980,1982, and 1984



Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

to reduce the extra consumption caused by the colder winters. Similarly, warmer winter temperatures would require less energy for heating (and might induce a slight increase in thermostat settings if they had been set at a low level).

Both the increase in prices and the more moderate winter temperatures from 1978 through 1984 contributed to households consuming less energy. However, the change in temperature was only modest, while the change in prices was quite substantial. Therefore, it is expected that the price change was the more important factor contributing to the reduction in energy consumption.

3. Consumption of and Expenditures for Individual Energy Sources

This chapter examines average consumption and expenditures, prices, and usage patterns for specific fuels. The fuels considered are electricity, natural gas, fuel oil (and kerosene), and LPG. Consumption and expenditures are averaged over only those households that use each specific energy source. This average gives typical consumption and expenditures for households that use a particular energy source.

Electricity

The data for site-electricity consumption per household for each of the four Census regions from 1978 through 1984 show that the South had the highest level of average consumption per household over this period (Figure 6).[10] The Northeast region had the lowest average consumption from 1978 through 1980; consumption in this region was nominally lower, but not statistically significantly lower, than that in the North Central for later years. (The averages for consumption and expenditures are only for households that used electricity.)

Nationally, there were apparent slight declines in average electricity consumption for each survey from 1978 through 1984. While none of these changes were statistically significant, the overall decline of 3.5 (±2.4) million Btu was statistically significant (Table 3).[11] Further, an examination of the panel data for the 1980 through 1982 period shows that the decline of 1.2 (±1.1) million Btu is just significant.

The Northeast region had small alternating increases and decreases in electricity consumption, which resulted in average consumption in this region being virtually unchanged from 1978 through 1984 (Table 1). The other regions showed nominal declines in consumption, but the changes were either marginally significant or not significant. For the North Central, the total decline was 3.7 (±4.6) million Btu; the South, 4.5 (±4.5); and the West, 6.8 (±7.0).

One important determinant of consumption patterns in the different regions is the consumers' cost for energy in each region. The pattern of electricity prices by region for residential consumers for the 7-year period shows that the Northeast, which had the lowest consumption, faced the highest prices among the four regions (Figure 6). The West and the South, which had relatively high levels of consumption, enjoyed the lowest prices.

Prices consistently increased over the period in each of the four regions and for the Nation. The largest increase occurred in the West where prices increased by almost 130 percent. The smallest increase was about 60 percent in the North Central. Nationally, prices increased on average by about 80 percent.

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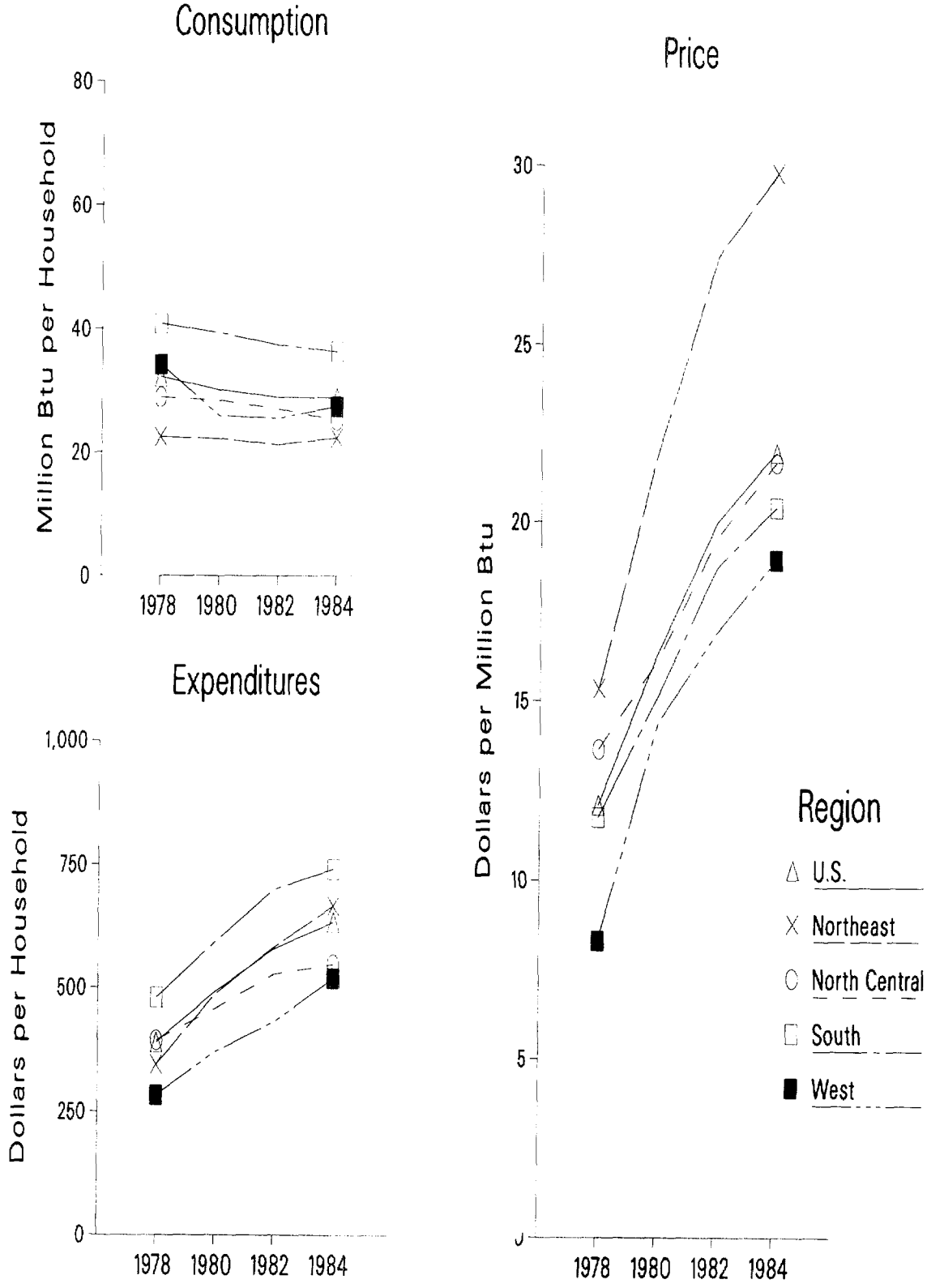
[10] All electricity Btu values and prices quoted in this section are "site-values;" they do not have the factor of three that adjusts for the fuels used to generate the electricity.

[11] Values for consumption declines or other changes cited in the text have been calculated from unrounded numbers and may not be numerically identical to values calculated from the rounded numbers in the tables.

Consumption of and Expenditures for Individual Energy Sources

Figure 6. Electricity: Average Consumption, Expenditures, and Prices by Region, 1978,1980,1982, and 1984



Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

Consumption of and Expenditures for Individual Energy Sources

Table 3. Average Consumption per Household for Site Electricity for the United States and by Region,1978-1982 and 1984 (Million Btu)

	1978	1979	1980	1981	1982	1984
			Total U.S.			
Full Sample						
Average Consumption	32.2	31.2	30.1	29.8	28.9	28.8
Standard Error	1.1	1.0	0.6	0.6	0.7	0.5
Change in Consumption[1]	-	-1.0	-1.1	-0.3	-0.9	-0.2
Dependent Sample Standard Error...	-	0.5	-	0.5	0.5	0.5
Indpendent Sample Standard Error ..	-	-	1.5	-	-	-
Panel 1980-1982						
Average Consumption	-	-	30.4	-	29.1	-
Standard Error	-	-	0.8	-	1.0	-
Change in Consumption[2]	-	-	-	-	-1.2	-
Dependent Sample Standard Error ..	-	-	-	-	0.6	-
Panel 1982-1984						
Average Consumption	-	-	-	-	28.8	29.1
Standard Error	-	-	-	-	0.7	0.7
Change in Consumption[2]	-	-	-	-	-	0.3
Dependent Sample Standard Error ..	-	-	-	-	-	0.4

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 3. Average Consumption per Household for Site Electricity for the United States and by Region,1978-1982 and 1984 (Continued) (Million Btu)

	1978	1979	1980	1981	1982	1984
			Northeast			
Full Sample						
Average Consumption	22.5	22.7	22.2	23.4	21.2	22.3
Standard Error	1.4	1.5	0.9	0.9	0.9	0.9
Change in Consumption[1]	-	0.2	-0.6	1.2	-2.2	1.1
Dependent Sample Standard Error ..	-	0.8	-	0.7	0.7	0.6
Independent Sample Standard Error ..	-	-	1.8	-	-	-
Panel 1980-1982						
Average Consumption	-	-	20.9	-	20.2	-
Standard Error	-	-	1.2	-	1.0	-
Change in Consumption[2]	-	-	-	-	-0.7	-
Dependent Sample Standard Error ..	-	-	-	-	0.9	-
Panel 1982-1984						
Average Consumption	-	-	-	-	22.2	23.3
Standard Error	-	-	-	-	1.1	1.2
Change in Consumption[2]	-	-	-	-	-	1.1
Dependent Sample Standard Error ..	-	-	-	-	-	0.6

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 3. Average Consumption per Household for Site Electricity for the United States and by Region,1978-1982 and 1984 (Continued) (Million Btu)

	1978	1979	1980	1981	1982	1984
			North Central			
Full Sample						
Average Consumption	28.9	28.7	28.4	27.0	27.0	25.2
Standard Error	2.0	2.3	1.1	1.2	1.5	1.2
Change in Consumption[1]	-	-0.3	-0.2	-1.5	0.0	-1.8
Dependent Sample Standard Error ..	-	0.7	-	0.8	1.1	0.9
Independent Sample Standard Error ..	-	-	2.5	-	-	-
Panel 1980-1982						
Average Consumption	-	-	29.8	-	28.8	-
Standard Error	-	-	1.7	-	2.2	-
Change in Consumption[2]	-	-	-	-	-1.0	-
Dependent Sample Standard Error ..	-	-	-	-	1.2	-
Panel 1982-1984						
Average Consumption	-	-	-	-	25.2	25.6
Standard Error	-	-	-	-	1.1	1.3
Change in Consumption[2]	-	-	-	-	-	0.5
Dependent Sample Standard Error ..	-	-	-	-	-	0.8

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 3. Average Consumption per Household for Site Electricity for the United States and by Region, 1978-1982 and 1984 (Continued) (Million Btu)

	1978	1979	1980	1981	1982	1984
			South			
Full Sample						
Average Consumption	40.8	38.9	39.3	37.1	37.4	36.3
Standard Error	2.0	1.4	1.1	1.1	1.3	1.1
Change in Consumption[1]	-	-1.9	0.3	-2.1	0.3	-1.1
Dependent Sample Standard Error ..	-	0.9	-	1.2	1.3	1.1
Independent Sample Standard Error ..	-	-	1.8	-	-	-
Panel 1980-1982						
Average Consumption	-	-	39.5	-	36.9	-
Standard Error	-	-	1.6	-	1.9	-
Change in Consumption[2]	-	-	-	-	-2.6	-
Dependent Sample Standard Error ..	-	-	-	-	0.9	-
Panel 1982-1984						
Average Consumption	-	-	-	-	37.9	36.3
Standard Error	-	-	-	-	1.2	1.3
Change in Consumption[2]	-	-	-	-	-	-1.7
Dependent Sample Standard Error ..	-	-	-	-	-	1.0

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 3. Average Consumption per Household for Site Electricity for the United States and by Region,1978-1982 and 1984 (Continued) (Million Btu)

	1978	1979	1980	1981	1982	1984
			West			
Full Sample						
Average Consumption	34.2	31.7	25.9	28.3	25.5	27.4
Standard Error	3.4	2.5	1.0	1.2	1.1	0.9
Change in Consumption[1]	-	-2.5	-5.8	2.5	2.8	1.8
Dependent Sample Standard Error ..	-	1.9	-	0.9	0.8	0.8
Independent Sample Standard Error ..	-	-	2.7	-	-	-
Panel 1980-1982						
Average Consumption	-	-	26.4	-	25.9	-
Standard Error	-	-	1.1	-	1.3	-
Change in Consumption[2]	-	-	-	-	-0.5	-
Dependent Sample Standard Error ..	-	-	-	-	0.9	-
Panel 1982-1984						
Average Consumption	-	-	-	-	25.2	27.3
Standard Error	-	-	-	-	1.3	1.4
Change in Consumption[2]	-	-	-	-	-	2.2
Dependent Sample Standard Error ..	-	-	-	-	-	0.8

[1]The change in consumption is from the preceding survey year to the year in the column. The change is for a 1-year interval for all years except for 1984 where the change is for the 2-year interval from 1982 to 1984.

[2]The change in consumption is for the 2-year period for the panel sample only.

Note: Numbers may not add to totals because of independent rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1979, 1980, 1982, and 1984.

Consumption of and Expenditures for Individual Energy Sources

For the Nation, the persistent increase in prices coupled with minor declines in consumption led to statistically significant increases in expenditures for electricity per household each year (Table 4). Expenditures rose from $390 in 1978 to $632 in 1984, a total increase of $243 (±15). The same picture holds for each of the regions; expenditures increased in most years and the increases were usually statistically significant. For the few cases where there was a nominal decline in expenditures, it was not statistically signficant.

The South had the highest level of average expenditures per household for electricity (Figure 6). Although prices in the South were the second lowest among the regions, the South's high consumption led to its having the highest average expenditures. In 1978, households in the Northeast had expenditures nominally below those in the North Central (but the difference was not statistically significant). However, the large price rise in the Northeast resulted in this region having an average expenditure level in 1984 that was not statistically different from that in the South. The West had the lowest level of average expenditures, though the difference between its consumption and that in the North Central was not significant after 1980.

The purposes for which electricity is used in the various regions affect the relative levels of consumption in the regions. Historically, the availability of cheaper electricity in some areas of the country--particularly the Tennessee Valley area in the South and the Pacific Northwest area of the West--led to more applications of electricity to home needs in these areas.

In 1984, the South had more homes that were "all-electric" than any other region: 26 (±5) percent of homes in this region used electricity for the main space heating fuel, for water heating fuel and for cooking (Table 5). The region ranking next in all-electric homes was the West, 15 (±4) percent, while in the Northeast and North Central regions, fewer than 10 percent of the homes were all-electric.

The South and West led the two other regions in the percentage of its households that used electricity for heating the home. The South had the largest percentage of homes that used electricity for water heating , and for space cooling (air conditioning).[12] The much warmer summer weather in the South (with about twice the number of CDD as the other regions) made the use of electricity for air conditioning particularly important to the South's pattern of energy use.

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[12]The data in Table 5 for air conditioning include refrigerator-type coolers only. They do not include evaporative coolers--sometimes called swamp coolers--which are used in dry areas of the West: 17 percent of all homes in the West used this form of space cooling. Since evaporative coolers use far less electricity than refrigeration units, the data in Table 5 still give a reasonably valid perspective on the potential consumption of electricity based on stocks of appliances.

Consumption of and Expenditures for Individual Energy Sources

Table 4. Average Expenditures per Household for Electricity for the United States and by Region, 1978-1982 and 1984 (Dollars)

	1978	1979	1980	1981	1982	1984
			Total U.S.			
Full Sample						
Average Expenditures	390	420	492	552	578	632
Standard Error	9	9	9	9	13	12
Change in Expenditures[1] ...	-	30	72	60	26	53
Dependent Sample Standard Error ..	-	6	-	7	10	9
Independent Sample Standard Error ..	-	-	13	-	-	-
Panel 1980-1982						
Average Expenditures	-	-	494	-	579	-
Standard Error	-	-	13	-	18	-
Change in Expenditures[2] ...	-	-	-	-	85	-
Dependent Sample Standard Error ..	-	-	-	-	11	-
Panel 1982-1984						
Average Expenditures	-	-	-	-	577	638
Standard Error	-	-	-	-	12	15
Change in Expenditures[2] ...	-	-	-	-	-	61
Dependent Sample Standard Error ..	-	-	-	-	-	8

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 4. Average Expenditures per Household for Electricity for the United States and by Region, 1978-1982 and 1984 (Continued) (Dollars)

	1978	1979	1980	1981	1982	1984
			Northeast			
Full Sample						
Average Expenditures	345	391	487	589	582	665
Standard Error	15	14	14	17	24	29
Change in Expenditures[1] ...	-	46	96	102	-7	83
Dependent Sample Standard Error ..	-	11	-	12	16	15
Independent Sample Standard Error ..	-	-	20	-	-	-
Panel 1980-1982						
Average Expenditures	-	-	466	-	557	-
Standard Error	-	-	20	-	29	-
Change in Expenditures[2] ...	-	-	-	-	90	-
Dependent Sample Standard Error ..	-	-	-	-	18	-
Panel 1982-1984						
Average Expenditures	-	-	-	-	606	696
Standard Error	-	-	-	-	27	33
Change in Expenditures[2] ...	-	-	-	-	-	90
Dependent Sample Standard Error ..	-	-	-	-	-	21

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 4. Average Expenditures per Household for Electricity for the United States and by Region, 1978-1982 and 1984 (Continued) (Dollars)

	1978	1979	1980	1981	1982	1984
			North Central			
Full Sample						
Average Expenditures	394	425	458	484	527	546
Standard Error	21	26	12	16	21	21
Change in Expenditures[1] ...	-	30	33	25	44	19
Dependent Sample Standard Error ..	-	11	-	13	19	16
Independent Sample Standard Error ..	-	-	28	-	-	-
Panel 1980-1982						
Average Expenditures	-	-	476	-	558	-
Standard Error	-	-	16	-	30	-
Change in Expenditures[2] ...	-	-	-	-	82	-
Dependent Sample Standard Error ..	-	-	-	-	23	-
Panel 1982-1984						
Average Expenditures	-	-	-	-	497	559
Standard Error	-	-	-	-	22	29
Change in Expenditures[2] ...	-	-	-	-	-	63
Dependent Sample Standard Error ..	-	-	-	-	-	15

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 4. Average Expenditures per Household for Electricity for the United States and by Region, 1978-1982 and 1984 (Continued) (Dollars)

	1978	1979	1980	1981	1982	1984
			South			
Full Sample						
Average Expenditures	480	508	593	640	700	740
Standard Error	20	16	20	17	24	24
Change in Expenditures[1] ...	-	28	85	47	61	40
Dependent Sample Standard Error ..	-	12	-	17	22	23
Independent Sample Standard Error ..	-	-	26	-	-	-
Panel 1980-1982						
Average Expenditures	-	-	598	-	693	-
Standard Error	-	-	31	-	36	-
Change in Expenditures[2] ...	-	-	-	-	95	-
Dependent Sample Standard Error ..	-	-	-	-	22	-
Panel 1982-1984						
Average Expenditures	-	-	-	-	708	736
Standard Error	-	-	-	-	21	28
Change in Expenditures[2] ...	-	-	-	-	-	28
Dependent Sample Standard Error ..	-	-	-	-	-	18

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 4. Average Expenditures per Household for Electricity for the United States and by Region, 1978-1982 and 1984 (Continued) (Dollars)

	1978	1979	1980	1981	1982	1984
			West			
Full Sample						
Average Expenditures	283	298	371	453	431	518
Standard Error	12	10	13	14	17	19
Change in Expenditures[1]	-	15	73	82	-21	87
Dependent Sample Standard Error	-	14	-	11	15	23
Independent Sample Standard Error	-	-	16	-	-	-
Panel 1980-1982						
Average Expenditures	-	-	379	-	434	-
Standard Error	-	-	17	-	19	-
Change in Expenditures[2]	-	-	-	-	55	-
Dependent Sample Standard Error	-	-	-	-	16	-
Panel 1982-1984						
Average Expenditures	-	-	-	-	429	506
Standard Error	-	-	-	-	25	29
Change in Expenditures[2]	-	-	-	-	-	77
Dependent Sample Standard Error	-	-	-	-	-	14

[1]The change in expenditures is from the preceding survey year to the year in the column. The change is for a 1-year interval for all years except for 1984 where the change is for the 2-year interval from 1982 to 1984.

[2]The change in expenditures is for the 2-year period for the panel sample only.

Note: Numbers may not add to totals because of independent rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1979, 1980, 1982, and 1984.

Consumption of and Expenditures for Individual Energy Sources

Table 5. Percentage of Households Using Electricity for Selected Purposes by Census Region, 1978 and 1984

End Use or Appliance	Northeast		North Central		South		West	
	1978	1984	1978	1984	1978	1984	1978	1984
All-Electric Home	7.4	6.9	4.5	5.9	22.8	26.0	19.0	15.4
Standard Error	(3.0)	(1.5)	(1.5)	(1.3)	(3.2)	(2.4)	(4.2)	(1.8)
Heating Fuel	14.0	17.9	16.4	16.6	35.6	43.4	32.0	36.4
Standard Error	(2.7)	(1.9)	(2.4)	(1.5)	(5.7)	(2.7)	(4.9)	(2.1)
Main Heating	7.9	7.5	5.3	6.2	26.8	28.7	20.1	19.8
Standard Error	(3.0)	(1.5)	(1.5)	(1.4)	(3.6)	(2.9)	(4.4)	(2.1)
Secondary Only	6.3	10.4	11.1	10.4	8.8	14.6	11.9	6.6
Standard Error	(1.4)	(1.2)	(1.4)	(1.4)	(1.1)	(1.2)	(2.5)	(1.1)
Heat Pump	0.6	1.1	Q	1.6	3.6	9.2	Q	3.3
Standard Error	(0.3)	(0.4)		(0.8)	(0.8)	(1.5)		(1.1)
Have Air-Conditioning	44.4	50.8	57.4	59.6	73.2	76.0	27.1	37.5
Standard Error	(5.0)	(2.7)	(3.4)	(3.6)	(2.6)	(1.7)	(6.1)	(3.2)
Have Central Unit	8.0	10.8	22.5	27.0	35.6	46.2	10.6	21.9
Standard Error	(1.9)	(1.4)	(2.6)	(2.9)	(2.4)	(2.6)	(2.8)	(3.0)
Have Window/Wall Unit Only	36.4	39.9	34.9	32.6	37.7	29.8	16.7	15.7
Standard Error	(4.1)	(2.4)	(3.1)	(2.7)	(2.9)	(1.9)	(4.5)	(2.2)
Main Water-Heating Fuel	20.4	21.9	20.3	23.1	51.6	52.5	32.9	26.3
Standard Error	(3.9)	(2.3)	(4.0)	(1.8)	(4.1)	(2.1)	(3.6)	(2.7)
Most-Used Refrigerator is Frost Free	49.5	51.9	56.7	59.0	53.5	67.4	50.0	69.3
Standard Error	(3.3)	(2.1)	(3.1)	(2.2)	(3.0)	(2.1)	(3.3)	(1.6)
Freezer	23.0	29.0	41.9	42.4	39.8	39.8	32.7	32.5
Standard Error	(2.4)	(1.3)	(2.5)	(2.0)	(2.5)	(1.9)	(3.3)	(2.1)
Clothes Dryer	35.8	41.5	44.2	44.2	51.4	50.3	46.6	44.8
Standard Error	(3.6)	(1.9)	(3.5)	(2.3)	(2.9)	(1.8)	(3.4)	(2.6)
Cooking Fuel	46.1	55.4	58.7	71.2	69.2	73.0	68.2	73.9
Standard Error	(4.4)	(2.4)	(3.2)	(2.2)	(2.7)	(2.1)	(4.9)	(2.3)
Range	36.6	41.9	47.6	51.6	64.1	62.2	62.7	55.3
Standard Error	(4.4)	(1.8)	(4.4)	(3.1)	(3.1)	(2.2)	(5.4)	(3.0)
Dishwasher	32.6	35.2	30.9	30.6	33.5	39.2	44.1	46.2
Standard Error	(4.5)	(1.9)	(2.2)	(2.4)	(2.8)	(2.1)	(3.9)	(2.5)

Q - Data withheld because of large variance (1.96 x Standard Error > Value).
NA: This information was not obtained in the 1978 survey.
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978 and 1984.

Consumption of and Expenditures for Individual Energy Sources

The distribution of households using electricity for various end uses showed only modest changes from 1978 through 1984, as might be expected given the small changes in consumption (Table 5). For the most part, the changes in the percentage of households using electricity for various end uses and appliances were not statistically significant. All regions showed a nominal increase in the percentage of households using electricity as a heating fuel, but for no region was the increase statistically significant. One noteworthy change, though, was the statistically significant increase in the number of households that used heat pumps, particularly in the South and West. The percentage more than doubled in the South from 1978 to 1984, with an additional 5.6 (±3.3) percent of households using heat pumps. There was also a sizeable increase in the West, where 3.3 (±2.2) percent of the households used them in 1984. The increased use of heat pumps, an efficient appliance for space heating, contributed to a decline in average electricity consumption per household.

There was an increase in the percentage of households with air-conditioning equipment in all regions, and the increase was statistically significant in all regions except the North Central. More important for energy consumption was the shift from households that had only window or wall units to households that had a central air- conditioning unit. Households with central units increased by 10.6 (±6.9) percentage points in the South and by 11.3 (±8.0) percentage points in the West, the two regions with the most cooling degree days in 1984. If households did not otherwise change their behavior (by, for example, raising the temperature to which they cool their house), this shift to more central units would be expected to lead to higher average electricity consumption.

For other appliances, the data suggest a slight increase in the percentage of households using them (Table 5). However, in many cases the changes are not statistically significant. Further, the impact on electricity consumption is not easy to determine since a new appliance is likely to be more efficient than an older one, and the gain in efficiency might more than offset the increased use of appliances. Overall, the changes in the number of households using electrical appliances for various end uses has not changed enough that it provides an obvious influence on the level of electricity consumption per household.

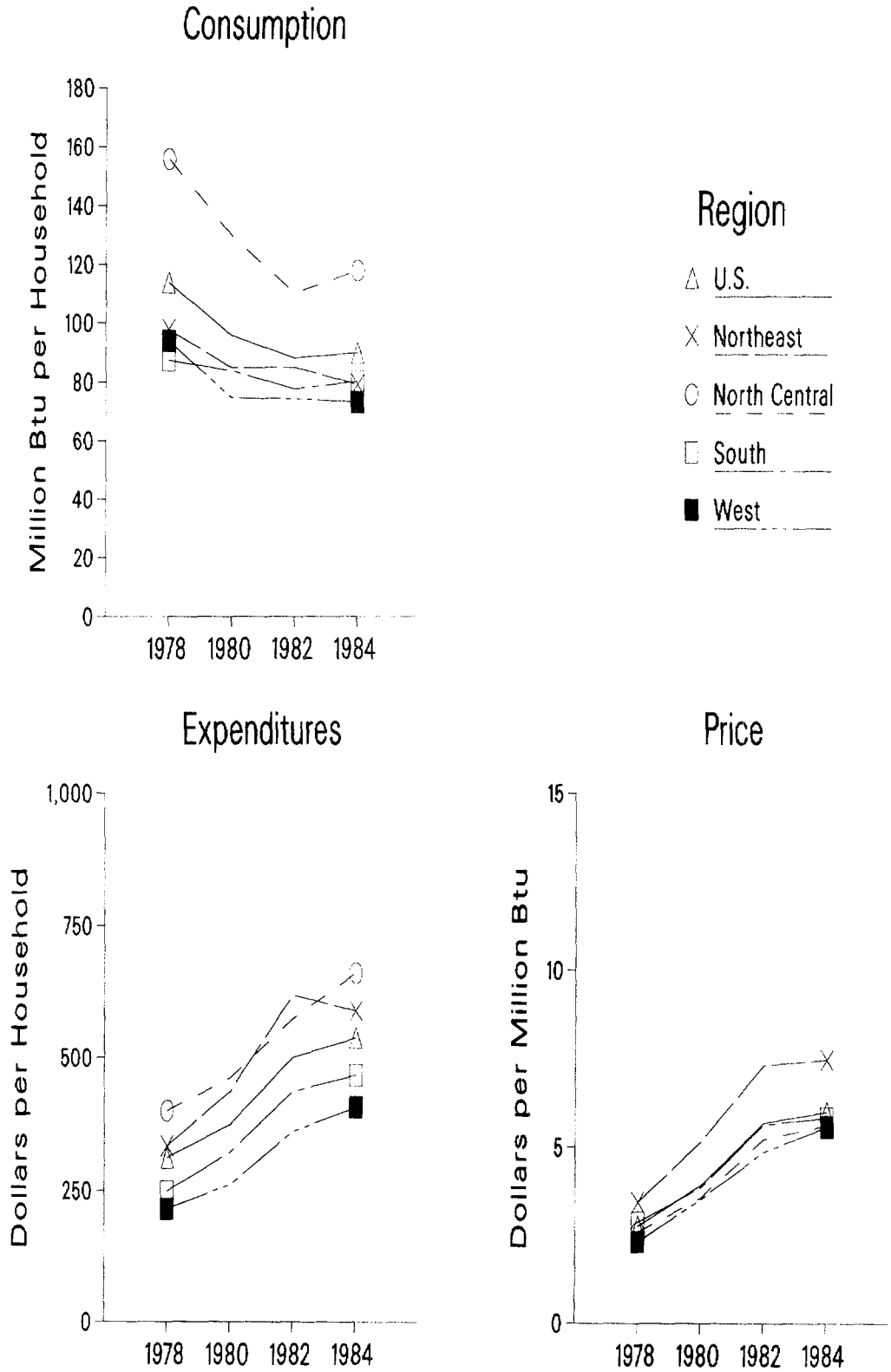
Natural Gas

Households in the North Central region were by far the most intensive consumers of natural gas among residential consumers across the Nation (Figure 7). However, because that region also had the largest decline in consumption, the difference in consumption between the North Central and the remaining regions narrowed by 1984. The Northeast appeared to have had the next largest average consumption per household from 1978 through 1984, but the differences between it and the other two regions were not statistically significant.

Nationally, consumption per household of natural gas declined by 24.4 (±6.9) million Btu from 1978 to 1984, or by about one-fifth (Table 6). Significant declines occurred in 1979, 1980, and 1982, with a small (statistically significant) increase occurring in 1981 and essentially no change in 1984.

Consumption of and Expenditures for Individual Energy Sources

Figure 7. Natural Gas: Average Consumption, Expenditures, and Prices by Region, 1978,1980,1982, and 1984



Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

Consumption of and Expenditures for Individual Energy Sources

Table 6. Average Consumption per Household of Natural Gas for the United States and by Region, 1978–1982 and 1984 (Million Btu)

	1978	1979	1980	1981	1982	1984
			Total U.S.			
Full Sample						
Average Consumption	114.3	107.0	95.7	100.9	88.1	89.9
Standard Error	3.2	2.7	1.6	1.8	1.5	1.5
Change in Consumption[1]	-	-7.3	-11.3	5.2	-12.8	1.8
Dependent Sample Standard Error	-	2.0	-	1.8	2.1	1.4
Independent Sample Standard Error	-	-	3.2	-	-	-
Panel 1980-1982						
Average Consumption	-	-	95.9	-	87.5	-
Standard Error	-	-	2.3	-	2.3	-
Change in Consumption[2]	-	-	-	-	-8.3	-
Dependent Sample Standard Error	-	-	-	-	1.7	-
Panel 1982-1984						
Average Consumption	-	-	-	-	88.7	91.2
Standard Error	-	-	-	-	2.1	1.8
Change in Consumption[2]	-	-	-	-	-	2.5
Dependent Sample Standard Error	-	-	-	-	-	2.8

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 6. Average Consumption per Household of Natural Gas for the United States and by Region, 1978-1982 and 1984 (Continued) (Million Btu)

	1978	1979	1980	1981	1982	1984
			Northeast			
Full Sample						
Average Consumption	98.1	91.2	84.8	93.1	85.0	79.2
Standard Error	8.2	5.8	5.3	4.9	4.4	3.8
Change in Consumption[1]	-	-6.9	-6.4	8.3	-8.1	-5.9
Dependent Sample Standard Error	-	4.3	-	4.2	5.2	4.2
Independent Sample Standard Error	-	-	7.8	-	-	-
Panel 1980-1982						
Average Consumption	-	-	83.5	-	81.2	-
Standard Error	-	-	6.2	-	6.1	-
Change in Consumption[2]	-	-	-	-	-2.3	-
Dependent Sample Standard Error	-	-	-	-	4.2	-
Panel 1982-1984						
Average Consumption	-	-	-	-	88.8	80.7
Standard Error	-	-	-	-	7.3	4.3
Change in Consumption[2]	-	-	-	-	-	-8.1
Dependent Sample Standard Error	-	-	-	-	-	5.6

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 6. Average Consumption per Household of Natural Gas for the United States and by Region, 1978-1982 and 1984 (Continued) (Million Btu)

	1978	1979	1980	1981	1982	1984
			North Central			
Full Sample						
Average Consumption	156.7	147.6	129.8	139.3	110.2	118.0
Standard Error	4.2	5.7	2.8	4.0	2.6	3.0
Change in Consumption[1]	-	-9.1	-17.8	9.6	-29.1	7.8
Dependent Sample Standard Error ..	-	4.0	-	4.3	4.9	3.1
Independent Sample Standard Error ..	-	-	6.3	-	-	-
Panel 1980-1982						
Average Consumption	-	-	129.3	-	110.8	-
Standard Error	-	-	4.8	-	4.5	-
Change in Consumption[2]	-	-	-	-	-18.5	-
Dependent Sample Standard Error ..	-	-	-	-	3.9	-
Panel 1982-1984						
Average Consumption	-	-	-	-	109.6	122.0
Standard Error	-	-	-	-	3.5	3.9
Change in Consumption[2]	-	-	-	-	-	12.4
Dependent Sample Standard Error ..	-	-	-	-	-	2.2

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 6. Average Consumption per Household of Natural Gas for the United States and by Region, 1978-1982 and 1984 (Continued) (Million Btu)

	1978	1979	1980	1981	1982	1984
			South			
Full Sample						
Average Consumption	87.6	83.3	83.8	81.5	77.7	80.3
Standard Error	4.5	3.6	3.0	3.0	3.1	3.7
Change in Consumption[1]	-	-4.3	0.4	-2.2	-3.9	2.7
Dependent Sample Standard Error	-	2.7	-	2.5	2.8	2.5
Independent Sample Standard Error	-	-	4.7	-	-	-
Panel 1980-1982						
Average Consumption	-	-	87.0	-	77.1	-
Standard Error	-	-	3.5	-	3.3	-
Change in Consumption[2]	-	-	-	-	-9.9	-
Dependent Sample Standard Error	-	-	-	-	3.1	-
Panel 1982-1984						
Average Consumption	-	-	-	-	78.3	79.3
Standard Error	-	-	-	-	4.1	3.8
Change in Consumption[2]	-	-	-	-	-	1.0
Dependent Sample Standard Error	-	-	-	-	-	1.9

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 6. Average Consumption per Household of Natural Gas for the United States and by Region, 1978-1982 and 1984 (Continued) (Million Btu)

	1978	1979	1980	1981	1982	1984
			West			
Full Sample						
Average Consumption	94.3	84.1	74.6	79.4	74.4	73.2
Standard Error	6.7	3.8	1.7	2.9	2.0	2.6
Change in Consumption[1]	-	10.2	-9.5	4.8	-4.9	-1.3
Dependent Sample Standard Error ..	-	3.8	-	2.3	2.5	1.9
Independent Sample Standard Error ..	-	-	4.1	-	-	-
Panel 1980-1982						
Average Consumption	-	-	75.8	-	75.7	-
Standard Error	-	-	2.4	-	2.0	-
Change in Consumption[2]	-	-	-	-	0.0	-
Dependent Sample Standard Error ..	-	-	-	-	1.5	-
Panel 1982-1984						
Average Consumption	-	-	-	-	73.2	72.4
Standard Error	-	-	-	-	3.2	3.8
Change in Consumption[2]	-	-	-	-	-	-0.7
Dependent Sample Standard Error ..	-	-	-	-	-	2.1

[1]The change in consumption is from the preceding survey year to the year in the column. The change is for a 1-year interval for all years except for 1984 where the change is for the 2-year interval from 1982 to 1984.

[2]The change in consumption is for the 2-year period for the panel sample only.

Note: Numbers may not add to totals because of independent rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1979, 1980, 1982, and 1984.

Consumption of and Expenditures for Individual Energy Sources

The two coldest regions, the Northeast and the North Central, showed patterns similar to the Nation, although the increase from 1982 to 1984 in the North Central was statistically significant. From 1978 to 1984, consumption declined 38.7 (±10.2) million Btu in the North Central and 18.9 (±17.8) in the Northeast. The West also experienced a substantial decline, 21.1 (±14.1) million Btu, while consumption in the South remained relatively unchanged.

Residential consumers in the Northeast paid the highest price for natural gas (Figure 7). Prices in the South, North Central, and West followed and were similar. All regions faced similar price increases from 1978 through 1984. On the average, prices more than doubled for residential consumers, with increases ranging from about 100 percent in the South, to about 140 percent in the Northeast.

Users of natural gas in the North Central region had the highest average expenditures of all the regions in 1978 and 1984, although the Northeast had nominally higher expenditures in 1982 (Figure 6). Average expenditures in the West and South were significally lower than those in the two colder regions from 1978 through 1984.

Nationally, natural gas expenditures increased by an average of $224 (±23), or by about 70 percent from 1978 to 1984 (Table 7). Expenditures increased each year, and the increases were statistically significant for each yearly change. The same pattern occurred in the regions for the most part. In some years, consumption declines were enough to offset the price increase so that average expenditures declined somewhat, but in no case was the apparent decline statistically significant. The increases in expenditures from 1978 to 1984 were $258 (±57) in the North Central region, $253 (±57) in the Northeast, $216 (±43) in the South and $189 (±39) in the West. In percentage terms the North Central had an increase of about 65 percent, the Northeast about 75 percent, and the West and South about 85 percent.

Three factors influence the level of consumption of natural gas: whether or not it is available, the mix of purposes for which it is used, and the proportion of households using it. Delivered by underground pipelines, natural gas is not universally available--unlike electricity, which is available in almost all areas of the country. Although the number of households that have gas available and use it affects the total gas consumption within a region, it has less influence on the average consumption per household within the region.[13]

The relative levels of consumption of natural gas per household are determined by what purposes the households in the different regions use it for. Natural gas, unlike electricity, has a limited set of end uses, but some of these are

[13]There is a strong association between availability of natural gas and the year in which houses were built. According to 1984 RECS data, about 75 percent of the homes built before 1970 had gas available, while slightly more than 50 percent of those built after 1970 had gas available.

Consumption of and Expenditures for Individual Energy Sources

Table 7. Average Expenditures per Household for Natural Gas for the United States and by Region, 1978-1982 and 1984 (Dollars)

	1978	1979	1980	1981	1982	1984
			Total U.S.			
Full Sample						
Average Expenditures	314	360	374	459	500	537
Standard Error	8	8	7	8	9	9
Change in Expenditures[1] ...	-	46	14	85	41	38
Dependent Sample Standard Error ..	-	6	-	7	11	9
Independent Sample Standard Error ..	-	-	11	-	-	-
Panel 1980-1982						
Average Expenditures	-	-	374	-	493	-
Standard Error	-	-	9	-	12	-
Change in Expenditures[2] ...	-	-	-	-	119	-
Dependent Sample Standard Error ..	-	-	-	-	10	-
Panel 1982-1984						
Average Expenditures	-	-	-	-	506	546
Standard Error	-	-	-	-	16	22
Change in Expenditures[2] ...	-	-	-	-	-	40
Dependent Sample Standard Error ..	-	-	-	-	-	16

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 7. Average Expenditures per Household for Natural Gas for the United States and by Region, 1978-1982 and 1984 (Continued) (Dollars)

	1978	1979	1980	1981	1982	1984
			Northeast			
Full Sample						
Average Expenditures	335	379	436	538	619	588
Standard Error	23	20	14	14	29	18
Change in Expenditures[1]	-	44	57	102	81	-31
Dependent Sample Standard Error	-	13	-	20	34	28
Independent Sample Standard Error	-	-	24	-	-	-
Panel 1980-1982						
Average Expenditures	-	-	427	-	586	-
Standard Error	-	-	21	-	39	-
Change in Expenditures[2]	-	-	-	-	159	-
Dependent Sample Standard Error	-	-	-	-	28	-
Panel 1982-1984						
Average Expenditures	-	-	-	-	650	604
Standard Error	-	-	-	-	49	25
Change in Expenditures[2]	-	-	-	-	-	-47
Dependent Sample Standard Error	-	-	-	-	-	40

See footnotes at end of table.

Table 7. Average Expenditures per Household for Natural Gas for the United States and by Region, 1978–1982 and 1984 (Continued) (Dollars)

	1978	1979	1980	1981	1982	1984
			North Central			
Full Sample						
Average Expenditures	402	464	461	580	574	660
Standard Error	10	17	14	19	16	19
Change in Expenditures[1] ...	-	62	-3	119	-6	86
Dependent Sample Standard Error ..	-	13	-	17	22	19
Independent Sample Standard Error ..	-	-	22	-	-	-
Panel 1980-1982						
Average Expenditures	-	-	460	-	578	-
Standard Error	-	-	19	-	24	-
Change in Expenditures[2] ...	-	-	-	-	118	-
Dependent Sample Standard Error ..	-	-	-	-	22	-
Panel 1982-1984						
Average Expenditures	-	-	-	-	570	684
Standard Error	-	-	-	-	16	22
Change in Expenditures[2] ...	-	-	-	-	-	114
Dependent Sample Standard Error ..	-	-	-	-	-	16

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 7. Average Expenditures per Household for Natural Gas for the United States and by Region, 1978-1982 and 1984 (Continued) (Dollars)

	1978	1979	1980	1981	1982	1984
			South			
Full Sample						
Average Expenditures	250	287	322	374	436	466
Standard Error	11	12	12	16	17	19
Change in Expenditures[1] ...	-	37	35	53	62	30
Dependent Sample Standard Error ..	-	9	-	10	15	14
Independent Sample Standard Error ..	-	-	17	-	-	-
Panel 1980-1982						
Average Expenditures	-	-	333	-	433	-
Standard Error	-	-	9	-	11	-
Change in Expenditures[2] ...	-	-	-	-	100	-
Dependent Sample Standard Error ..	-	-	-	-	7	-
Panel 1982-1984						
Average Expenditures	-	-	-	-	440	461
Standard Error	-	-	-	-	27	22
Change in Expenditures[2] ...	-	-	-	-	-	21
Dependent Sample Standard Error ..	-	-	-	-	-	12

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 7. Average Expenditures per Household for Natural Gas for the United States and by Region, 1978-1982 and 1984 (Continued) (Dollars)

	1978	1979	1980	1981	1982	1984
			West			
Full Sample						
Average Expenditures	216	246	261	318	361	406
Standard Error	12	9	6	12	9	16
Change in Expenditures[1] ...	-	30	14	58	43	45
Dependent Sample Standard Error ..	-	14	-	11	11	15
Independent Sample Standard Error ..	-	-	13	-	-	-
Panel 1980-1982						
Average Expenditures	-	-	266	-	364	-
Standard Error	-	-	9	-	11	-
Change in Expenditures[2] ...	-	-	-	-	99	-
Dependent Sample Standard Error ..	-	-	-	-	7	-
Panel 1982-1984						
Average Expenditures	-	-	-	-	358	402
Standard Error	-	-	-	-	16	22
Change in Expenditures[2] ...	-	-	-	-	-	44
Dependent Sample Standard Error ..	-	-	-	-	-	16

[1]The change in expenditures is from the preceding survey year to the year in the column. The change is for a 1-year interval for all years except for 1984 where the change is for the 2-year interval from 1982 to 1984.

[2]The change in expenditures is for the 2-year period for the panel sample only.

Note: Numbers may not add to totals because of independent rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1979, 1980, 1982, and 1984.

the most energy intensive: space heating and water heating. Gas is also used for cooking and in some homes, for clothes drying. Consumption of natural gas for other uses represents only a small portion of the natural gas consumed in the residential sector.

More than 95 percent of the households in the North Central region that used natural gas used it as the main space heating fuel (Table 8). This intensive use of gas for space heating, coupled with the severe winters in the North Central region, accounted for its having the highest average consumption among the regions.

Table 8. Percentage of Households Using Natural Gas for Selected Purposes by Census Region, 1978 and 1984

End Use or Appliance	Northeast		North Central		South		West	
	1978	1984	1978	1984	1978	1984	1978	1984
All Households in Region that Use Gas	67.4	64.2	78.6	78.0	44.7	48.9	71.9	73.0
Standard Error	(4.2)	(3.8)	(4.9)	(2.0)	(5.3)	(2.9)	(4.1)	(2.6)
Use Gas for:								
Heating Fuel	42.3	40.6	75.0	77.0	42.1	46.0	69.9	67.8
Standard Error	(3.6)	(3.9)	(5.1)	(2.0)	(5.5)	(3.1)	(4.7)	(2.8)
Main Space Heating	40.1	39.2	74.2	75.8	40.7	44.7	68.2	65.3
Standard Error ..	(3.6)	(3.9)	(5.0)	(2.0)	(5.5)	(3.0)	(4.5)	(2.7)
Secondary Heating Only ..	2.2	1.3	0.8	1.2	1.3	1.3	Q	2.5
Standard Error ..	(0.7)	(0.3)	(0.4)	(0.3)	(0.4)	(0.4)		(0.9)
Main Water-Heating Fuel	46.5	46.2	74.5	70.4	38.6	39.8	65.5	67.5
Standard Error	(3.8)	(4.0)	(5.1)	(2.1)	(4.5)	(2.9)	(3.9)	(3.0)
Cooking	58.3	51.8	51.4	42.8	26.1	28.9	37.0	41.4
Standard Error	(4.2)	(2.6)	(5.5)	(2.8)	(2.8)	(2.2)	(5.4)	(2.6)
Clothes Dryer	15.8	15.9	24.9	19.5	4.3	9.3	11.0	15.9
Standard Error	(2.1)	(1.4)	(3.1)	(1.2)	(1.2)	(1.4)	(2.0)	(1.5)

Q - Data withheld because of large variance (1.96 x Standard Error $\geq$ Value).
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Survey, 1978 and 1984.

Consumption of and Expenditures for Individual Energy Sources

Approximately 60 percent of the households in the Northeast that used gas made it their main heating fuel. This was the lowest percentage of all the regions; in the other three regions, about 90 percent or more of the households that used gas made it the main heating fuel. The Northeast also had the lowest percentage of homes using gas for water heating--about 70 percent in 1984, compared with about 80 percent in the South and about 90 percent in the West and North Central regions. In addition, the Northeast had a significant group of households (about 20 percent) that used natural gas only for cooking.

Offsetting these factors that would lower the average consumption in the Northeast was the winter weather there, which was almost as severe as in the North Central region and was much colder than in either the South or the West. This colder weather is an important factor in understanding the relatively high level of natural gas consumption reported by households in the Northeast. There were no important distinctions between the South and West in either weather or patterns of end uses for gas. This is consistent with the small differences between the average levels of consumption for the two regions.

Little of the decline in average consumption of gas shown in Figure 7 can be explained by the changes in end-use patterns for natural gas shown in Table 8. Among all households that used gas between 1978 and 1984, there were generally only small, statistically insignificant changes in the percentage that used it for the different end uses. Natural gas was not used much as a secondary heating fuel. In the North Central region, there was a decline in the percentage of households that used gas for end uses other than space heating, with the declines for cooking and clothes drying being statistically significant. These reductions in the end-use pattern of natural gas may have contributed to the sizeable decline in consumption for this region. Studies of the 1978, 1980, and 1981 RECS data suggest that an important factor in the decline in household consumption of natural gas was a drop in the average amount of gas consumed for space heating.[14]

Fuel Oil/Kerosene

Households using fuel oil and kerosene experienced dramatic changes in consumption, expenditures, and price from 1978 through 1984 (Figure 8). Consumption of fuel oil/kerosene showed the most dramatic decline of all fuels for the 7-year period. A substantial proportion of the decline in consumption occurred from 1978 through 1980, when prices doubled. After 1981, prices reversed and began to decline while consumption continued to decline in most regions, although the changes were not always statistically significant.

For the Nation, consumption in 1984 had declined by 55.4 (±9.1) million Btu from the average consumption level of 127.3 (±7.8) in 1978 (Table 9). Consumption declined in each year of the survey, although for 1980 and 1984, the changes were not statistically significant.

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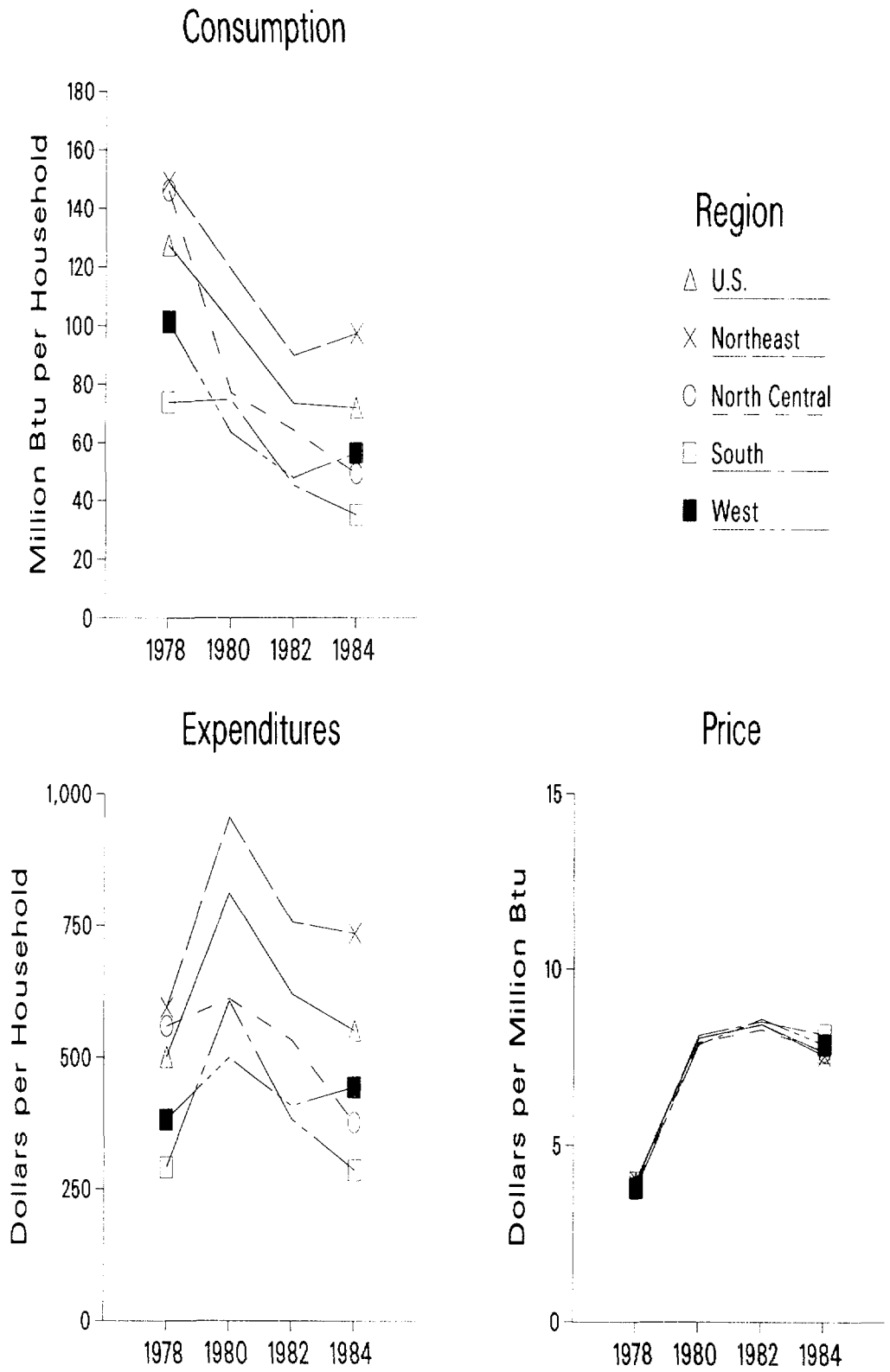
[14] Residential Energy Consumption and Expenditures by End Use for 1978, 1980, and 1981; December 1984.

Consumption of and Expenditures for Individual Energy Sources

Figure 8. Fuel Oil/Kerosene: Average Consumption, Expenditures, and Prices by Region, 1978,1980,1982, and 1984



Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

Consumption of and Expenditures for Individual Energy Sources

Table 9. Average Consumption per Household of Fuel Oil and Kerosene for the United States and by Region, 1978-1982 and 1984 (Million Btu)

	1978	1979	1980	1981	1982	1984
			Total U.S.			
Full Sample						
Average Consumption	127.3	107.2	100.8	91.2	73.4	71.9
Standard Error	4.0	4.3	2.5	2.8	2.4	2.4
Change in Consumption[1]	-	-20.1	-6.4	-9.6	-17.8	-1.5
Dependent Sample Standard Error ..	-	3.9	-	2.0	2.2	2.7
Independent Sample Standard Error ..	-	-	5.0	-	-	-
Panel 1980-1982						
Average Consumption	-	-	101.5	-	72.0	-
Standard Error	-	-	2.9	-	2.3	-
Change in Consumption[2]	-	-	-	-	-29.6	-
Dependent Sample Standard Error ..	-	-	-	-	2.6	-
Panel 1982-1984						
Average Consumption	-	-	-	-	74.8	71.4
Standard Error	-	-	-	-	3.8	4.3
Change in Consumption[2]	-	-	-	-	-	-3.4
Dependent Sample Standard Error ..	-	-	-	-	-	3.9

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 9. Average Consumption per Household of Fuel Oil and Kerosene for the United States and by Region, 1978-1982 and 1984 (Continued) (Million Btu)

	1978	1979	1980	1981	1982	1984
			Northeast			
Full Sample						
Average Consumption	149.2	130.8	118.7	108.0	89.7	97.3
Standard Error	5.0	6.4	3.6	4.4	3.3	2.0
Change in Consumption[1]	-	-18.4	-12.1	-10.7	-18.3	7.6
Dependent Sample Standard Error	-	5.9	-	2.4	2.7	3.8
Independent Sample Standard Error	-	-	7.3	-	-	-
Panel 1980-1982						
Average Consumption	-	-	120.2	-	88.2	-
Standard Error	-	-	4.1	-	3.4	-
Change in Consumption[2]	-	-	-	-	-32.0	-
Dependent Sample Standard Error	-	-	-	-	2.7	-
Panel 1982-1984						
Average Consumption	-	-	-	-	91.2	93.9
Standard Error	-	-	-	-	4.6	4.0
Change in Consumption[2]	-	-	-	-	-	2.7
Dependent Sample Standard Error	-	-	-	-	-	3.7

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 9. Average Consumption per Household of Fuel Oil and Kerosene for the United States and by Region, 1978-1982 and 1984 (Continued) (Million Btu)

	1978	1979	1980	1981	1982	1984
			North Central			
Full Sample						
Average Consumption	146.1	112.8	77.0	75.0	64.3	49.1
Standard Error	12.5	6.1	4.3	4.1	5.1	3.9
Change in Consumption[1]	-	-33.2	-35.8	-2.1	-10.7	-15.2
Dependent Sample Standard Error	-	11.9	-	4.3	7.0	7.2
Independent Sample Standard Error	-	-	7.5	-	-	-
Panel 1980-1982						
Average Consumption	-	-	68.1	-	59.8	-
Standard Error	-	-	5.6	-	7.0	-
Change in Consumption[2]	-	-	-	-	-8.3	-
Dependent Sample Standard Error	-	-	-	-	2.7	-
Panel 1982-1984						
Average Consumption	-	-	-	-	67.5	56.7
Standard Error	-	-	-	-	8.1	6.6
Change in Consumption[2]	-	-	-	-	-	-10.8
Dependent Sample Standard Error	-	-	-	-	-	11.0

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 9. Average Consumption per Household of Fuel Oil and Kerosene for the United States and by Region, 1978-1982 and 1984 (Continued) (Million Btu)

	1978	1979	1980	1981	1982	1984
			South			
Full Sample						
Average Consumption	73.8	65.6	74.7	56.6	45.0	35.0
Standard Error	6.7	4.4	6.1	6.7	4.2	4.5
Change in Consumption[2]	-	-8.1	9.0	-18.1	-11.6	-10.0
Dependent Sample Standard Error	-	3.6	-	4.8	5.6	3.2
Independent Sample Standard Error	-	-	7.5	-	-	-
Panel 1980-1982						
Average Consumption	-	-	76.1	-	45.1	-
Standard Error	-	-	7.0	-	4.4	-
Change in Consumption[2]	-	-	-	-	-31.0	-
Dependent Sample Standard Error	-	-	-	-	5.4	-
Panel 1982-1984						
Average Consumption	-	-	-	-	44.9	36.4
Standard Error	-	-	-	-	5.7	6.5
Change in Consumption[2]	-	-	-	-	-	-8.4
Dependent Sample Standard Error	-	-	-	-	-	4.6

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 9. Average Consumption per Household of Fuel Oil and Kerosene for the United States and by Region, 1978-1982 and 1984 (Continued) (Million Btu)

	1978	1979	1980	1981	1982	1984
			West			
Full Sample						
Average Consumption	101.3	82.3	63.5	62.5	47.6	56.3
Standard Error	6.5	9.2	5.0	8.8	4.9	8.2
Change in Consumption[1]	-	-19.0	-18.9	-0.9	-15.0	8.8
Dependent Sample Standard Error ..	-	8.6	-	10.2	9.2	6.5
Independent Sample Standard Error ..	-	-	10.5	-	-	-
Panel 1980-1982						
Average Consumption	-	-	57.9	-	49.7	-
Standard Error	-	-	6.0	-	7.6	-
Change in Consumption[2]	-	-	-	-	-8.2	-
Dependent Sample Standard Error ..	-	-	-	-	9.0	-
Panel 1982-1984						
Average Consumption	-	-	-	-	46.4	69.0
Standard Error	-	-	-	-	5.7	7.5
Change in Consumption[a]	-	-	-	-	-	22.6
Dependent Sample Standard Error ..	-	-	-	-	-	7.9

[1]The change in consumption is from the preceding survey year to the year in the column. The change is for a 1-year interval for all years except for 1984 where the change is for the 2-year interval from 1982 to 1984.

[2]The change in consumption is for the 2-year period for the panel sample only. 30

Note: Numbers may not add to totals because of independent rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1979, 1980, 1982, and 1984.

Consumption of and Expenditures for Individual Energy Sources

Households in the Northeast, who were the most dependent on fuel oil/kerosene for space heating, lowered their average consumption by 51.9 (±10.5) million Btu, which was about 35 percent of the 1978 consumption level. In percentage terms, this was the smallest decrease of all the regions. The largest decrease took place in the North Central region, where average consumption declined from 1978 to 1984 by 97.0 (±25.7) million Btu, slightly more than 65 percent of the 1978 consumption level. The North Central region went from a consumption level that was statistically indistinguishable from that in the North- east, to one that was in the same range as consumption in the South and West.

The steep price rise that occurred from 1978 to 1980 was one of the largest price changes for a specific fuel faced by households from 1978 to 1984 (Figure 8). The RECS data indicate that all regions experienced dramatic increases in price between 1978 and 1980. In 1981, there was another small increase, followed in 1982 by a slight decline and a further decline in 1984. Fuel oil/kerosene is the only energy source considered in this report for which there was no significant variation across the regions in the price residential consumers paid, except for a small spread in 1984.

Although prices declined after 1981, consumption continued to fall in all regions except the West, though the changes were not all statistically significant. An interesting divergence occurs in testing the statistical signficance of the decrease in consumption from 1982 to 1984 for the North Central and South regions, depending on whether the full sample or panel sample is used for the test. In both regions, the significance test based on the full sample is positive, while the panel data would indicate the decline was not signficant (Table 9). (This difference may be a result of the larger variance for the panel sample because of its smaller size.) In the West, the changes in consumption after 1980 were not statistically significant.

Expenditures for fuel oil/kerosene increased substantially from 1978 to 1980. However, the combination of falling prices and declining consumption led to declines in expenditures by 1984 (Figure 8). This rise and then fall in expenditures, giving rise to the inverse V-shaped pattern for expenditures (Figure 8), is in contrast to the generally rising pattern of expenditures for all fuels (Figure 4), electricity (Figure 6), and natural gas (Figure 7).

Nationally, expenditures for fuel oil/kerosene increased by $310 (±49) from the average level of $501 (±31) in 1978 to an average level of 811 (±37) in 1980, and then fell to $550 (±35) in 1984 (Table 10). The difference of $49 (±47) from 1978 to 1984 is just barely statistically significant.

For the regions, there was a wide variation in the pattern of increases and decreases in expenditures. Expenditures in the Northeast increased by $369 (±45) over the 1978 value at their peak, and in 1984, they were still $140 (±25) more than they had been in 1978. Expenditures in the North Central region increased less, by $153 (±96) and then fell to a value in 1984 that was $182 (±55) lower than the 1978 figure. For the South, expenditures increased by $315 (±54), and then fell to a level statistically indistinguishable from the 1978 figure. The West showed a more mixed pattern of increases and decreases with

Consumption of and Expenditures for Individual Energy Sources

Table 10. Average Expenditures per Household for Fuel Oil and Kerosene for the United States and by Region, 1978–1982 and 1984 (Dollars)

	1978	1979	1980	1981	1982	1984
			Total U.S.			
Full Sample						
Average Expenditures	501	674	811	811	619	550
Standard Error	16	27	19	25	21	18
Change in Expenditures[1]	-	173	137	0	-192	-69
Dependent Sample Standard Error ..	-	23	-	18	20	20
Independent Sample Standard Error ..	-	-	33	-	-	-
Panel 1980–1982						
Average Expenditures	-	-	816	-	608	-
Standard Error	-	-	23	-	19	-
Change in Expenditures[2] ...	-	-	-	-	-208	-
Dependent Sample Standard Error ..	-	-	-	-	21	-
Panel 1982–1984						
Average Expenditures	-	-	-	-	628	547
Standard Error	-	-	-	-	32	34
Change in Expenditures[2] ...	-	-	-	-	-	-81
Dependent Sample Standard Error ..	-	-	-	-	-	28

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 10. Average Expenditures per Household for Fuel Oil and Kerosene for the United States and by Region, 1978-1982 and 1984 (Continued) (Dollars)

	1978	1979	1980	1981	1982	1984
			Northeast			
Full Sample						
Average Expenditures	594	820	955	963	756	734
Standard Error	20	40	29	40	28	15
Change in Expenditures[1] ...	-	226	135	8	-207	-22
Dependent Sample Standard Error ..	-	36	-	22	24	30
Independent Sample Standard Error ..	-	-	50	-	-	-
Panel 1980-1982						
Average Expenditures	-	-	966	-	743	-
Standard Error	-	-	33	-	29	-
Change in Expenditures[2] ...	-	-	-	-	-223	-
Dependent Sample Standard Error ..	-	-	-	-	22	-
Panel 1982-1984						
Average Expenditures	-	-	-	-	768	713
Standard Error	-	-	-	-	40	34
Change in Expenditures[2] ...	-	-	-	-	-	-56
Dependent Sample Standard Error ..	-	-	-	-	-	27

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 10. Average Expenditures per Household for Fuel Oil and Kerosene for the United States and by Region, 1978-1982 and 1984 (Continued) (Dollars)

	1978	1979	1980	1981	1982	1984
			North Central			
Full Sample						
Average Expenditures	559	712	610	653	532	377
Standard Error	45	39	33	35	41	31
Change in Expenditures[1] ...	-	153	-101	43	-121	-156
Dependent Sample Standard Error ..	-	49	-	36	57	56
Independent Sample Standard Error ..	-	-	51	-	-	-
Panel 1980-1982						
Average Expenditures	-	-	538	-	503	-
Standard Error	-	-	47	-	62	-
Change in Expenditures[2] ...	-	-	-	-	-35	-
Dependent Sample Standard Error ..	-	-	-	-	48	-
Panel 1982-1984						
Average Expenditures	-	-	-	-	553	432
Standard Error	-	-	-	-	59	52
Change in Expenditures[2] ...	-	-	-	-	-	-121
Dependent Sample Standard Error ..	-	-	-	-	-	76

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 10. Average Expenditures per Household for Fuel Oil and Kerosene for the United States and by Region, 1978-1982 and 1984 (Continued) (Dollars)

	1978	1979	1980	1981	1982	1984
			South			
Full Sample						
Average Expenditures	291	417	606	505	383	285
Standard Error	26	27	48	56	36	33
Change in Expenditures[1]	-	126	189	-101	-122	-98
Dependent Sample Standard Error	-	16	-	42	47	25
Independent Sample Standard Error	-	-	55	-	-	-
Panel 1980-1982						
Average Expenditures	-	-	617	-	387	-
Standard Error	-	-	56	-	38	-
Change in Expenditures[2]	-	-	-	-	-230	-
Dependent Sample Standard Error	-	-	-	-	44	-
Panel 1982-1984						
Average Expenditures	-	-	-	-	378	291
Standard Error	-	-	-	-	47	49
Change in Expenditures[2]	-	-	-	-	-	-87
Dependent Sample Standard Error	-	-	-	-	-	40

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 10. Average Expenditures per Household for Fuel Oil and Kerosene for the United States and by Region, 1978-1982 and 1984 (Continued) (Dollars)

	1978	1979	1980	1981	1982	1984
			West			
Full Sample						
Average Expenditures	382	514	499	548	408	443
Standard Error	23	55	40	78	40	62
Change in Expenditures[1] ...	-	132	-16	49	-139	34
Dependent Sample Standard Error ..	-	46	-	86	78	51
Independent Sample Standard Error ..	-	-	68	-	-	-
Panel 1980-1982						
Average Expenditures	-	-	453	-	423	-
Standard Error	-	-	48	-	61	-
Change in Expenditures[2] ...	-	-	-	-	-30	-
Dependent Sample Standard Error ..	-	-	-	-	76	-
Panel 1982-1984						
Average Expenditures	-	-	-	-	400	545
Standard Error	-	-	-	-	49	62
Change in Expenditures[2]	-	-	-	-	-	145
Dependent Sample Standard Error ..	-	-	-	-	-	68

[1]The change in expenditures is from the preceding survey year to the year in the column. The change is for a 1-year interval for all years except for 1984 where the change is for the 2-year interval from 1982 to 1984.

[2]The change in expenditures is for the 2-year period for the panel sample only.

Note: Numbers may not add to totals because of independent rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1979, 1980, 1982, and 1984.

only the increase in 1979 being statistically significant. Average expenditures in 1984 were nominally higher than in 1978, but the difference was not significant statistically.

Fuel oil and kerosene had the most limited set of applications among the various energy sources for use in the home. These fuels are used mainly for space heating, with a limited number of households, principally in the Northeast, also using them for water heating (Table 11). The Northeast had the highest proportion of householders using fuel oil/kerosene, with slightly more than one-half the households using them. In the other regions, less than 20 percent of households used them. The bulk of householders in the Northeast also used fuel oil and kerosene for their main heating fuel, making this region very dependent on these fuels.

Table 11. Percentage of Households that Use Fuel Oil and Kerosene for Selected Purposes by Region, 1978 and 1984

End Use	Northeast		North Central		South		West	
	1978	1984	1978	1984	1978	1984	1978	1984
Use Fuel Oil/ Kerosene	51.1	52.0	15.4	12.1	17.6	15.8	6.0	4.0
Standard Error	(4.5)	(3.0)	(3.7)	(1.3)	(2.4)	(1.9)	(1.3)	(0.8)
Heat with Fuel Oil/Kerosene	51.1	51.5	15.4	11.4	17.6	14.8	6.0	3.8
Standard Error	(4.5)	(3.0)	(3.7)	(1.3)	(2.4)	(1.9)	(1.3)	(0.8)
Main Heating	50.8	44.7	15.1	5.4	17.0	8.1	5.6	2.7
Standard Error	(4.6)	(2.2)	(3.7)	(0.9)	(2.4)	(1.4)	(1.3)	(0.7)
Secondary Heating Only	Q	6.8	Q	5.9	0.5	6.6	0.4	1.1
Standard Error		(1.3)		(1.0)	(0.2)	(0.9)	(0.2)	(0.3)
Main Water Heating	29.8	27.9	Q	Q	1.6	0.7	Q	Q
Standard Error	(4.0)	(2.0)			(0.4)	(0.3)		

Q - Data withheld because of large variance (1.96 x Standard Error $\geq$ Value).
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978 and 1984.

The pattern of relative consumption levels of fuel oil/kerosene among the regions is explained by (1) the relative proportions of households that used the fuels as the primary heating fuel and (2) the relative weather conditions. Although winters in the Northeast were not quite as cold as those in the North Central, in

the Northeast a higher proportion of housing units used fuel oil/kerosene as the main heating fuel. This more intense use of these fuels for space heating contributed to the Northeast region having a consumption level comparable to that in the North Central region.

An important factor underlying the decline in the average consumption of fuel oil/kerosene is the movement away from the use of these fuels as the main heating fuel and an increase in the percentage using them as secondary fuels. All regions except the Northeast, where the decline was statistically insignificant, had substantial proportions of households that used fuel oil stop using it as the main heating fuel. In the North Central region, which had the largest decline in consumption, the percentage of households using these fuels as the main heating fuel dropped from 15.1 (±7.3) percent to 5.4 (±1.8) percent. A similar number of households began using these fuels as a secondary heat source, which resulted in a statistically insignificant decline in the percentage of households using these fuels for heating. In the South and West, the percentage of households using fuel oil/kerosene as the main heating fuel was cut in half from 1978 to 1984.

Liquefied Petroleum Gas

The trend in consumption for liquefied petroleum gas (LPG) generally shows a small decline overall from 1978 to 1984 (Figure 9). Nationally, average consumption fell by 7.1 (±4.6) million Btu. However, none of the annual declines are statistically significant (Table 12). Each region shows nominal declines in consumption, with occasional increases, but these changes were not statistically significant. The West showed the largest apparent decline of 27.1 (±37.5) million Btu, but this change is not statistically significant.

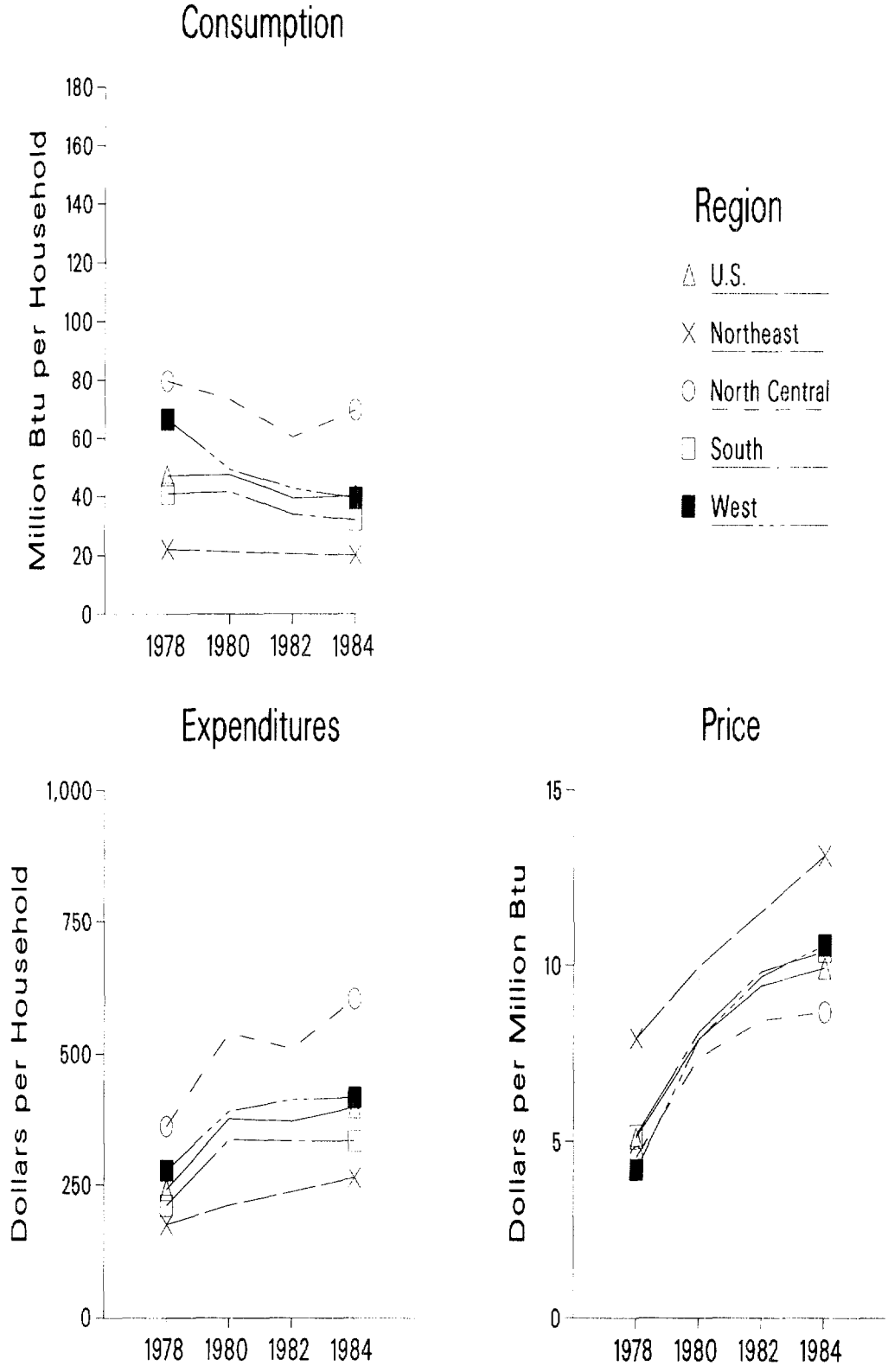
Prices in each region rose persistently, with the national average price almost doubling (Figure 9). The largest price increase occurred in the West, where prices increased by about 150 percent, and the smallest increase was in the Northeast, where prices increased by about 65 percent.

The steep increase in prices coupled with the slight decline in consumption gave rise to an increase in expenditures nationally and in each region (Figure 9). Nationally, expenditures for LPG increased by $157 (±46) from 1978 to 1984 over the 1978 level of $241 (±31) (Table 13).

Statistically significant increases in expenditures for the Nation occurred in 1979 and 1980, with expenditures remaining relatively unchanged over the rest of the period. The Northeast region had the smallest increase in expenditures of $89 (±89), which was only marginally significant. For the other regions, the increases in expenditures for LPG from 1978 through 1984 were statistically significant, but annual changes were not significant except in the South. The largest overall increase in expenditures appeared to take place in the North Central region, $247 (±150). However, because of the large variance associated with this change, it is not statistically significantly different from the increases in the West, $139 (±53) and the South, $122 (±63).

Consumption of and Expenditures for Individual Energy Sources

Figure 9. Liquefied Petroleum Gas: Average Consumption, Expenditures, and Prices by Region, 1978,1980,1982, and 1984



Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

Consumption of and Expenditures for Individual Energy Sources

Table 12. Average Consumption per Household of Liquefied Petroleum Gas for the United States and by Region, 1978-1982 and 1984 (Million Btu)

	1978	1979	1980	1981	1982	1984
			Total U.S.			
Full Sample						
Average Consumption	47.2	43.8	47.6	42.6	39.4	40.1
Standard Error	4.0	4.1	2.5	2.5	2.3	2.3
Change in Consumption[1]	-	-3.4	3.8	-5.0	-3.2	0.7
Dependent Sample Standard Error ..	-	3.0	-	3.3	3.4	2.6
Independent Sample Standard Error ..	-	-	4.5	-	-	-
Panel 1980-1982						
Average Consumption	-	-	44.5	-	39.6	-
Standard Error	-	-	3.0	-	2.9	-
Change in Consumption[2]	-	-	-	-	-4.9	-
Dependent Sample Standard Error ..	-	-	-	-	1.9	-
Panel 1982-1984						
Average Consumption	-	-	-	-	39.3	40.6
Standard Error	-	-	-	-	3.1	3.7
Change in Consumption[2]	-	-	-	-	-	1.3
Dependent Sample Standard Error ..	-	-	-	-	-	3.0

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 12. Average Consumption per Household of Liquefied Petroleum Gas for the United States and by Region, 1978-1982 and 1984 (Continued) (Million Btu)

	1978	1979	1980	1981	1982	1984
			Northeast			
Full Sample						
Average Consumption	22.1	22.2	21.3	23.9	20.5	20.1
Standard Error	5.4	5.4	5.4	8.0	3.0	3.0
Change in Consumption[1]	-	0.2	-0.9	2.6	-3.4	-0.4
Dependent Sample Standard Error ..	-	8.6	-	5.7	7.0	2.6
Independent Sample Standard Error ..	-	-	7.6	-	-	-
Panel 1980-1982						
Average Consumption	-	-	21.1	-	17.3	-
Standard Error	-	-	6.1	-	4.1	-
Change in Consumption[2]	-	-	-	-	-3.8	-
Dependent Sample Standard Error ..	-	-	-	-	3.9	-
Panel 1982-1984						
Average Consumption	-	-	-	-	24.1	22.5
Standard Error	-	-	-	-	6.4	4.2
Change in Consumption[2]	-	-	-	-	-	-1.6
Dependent Sample Standard Error ..	-	-	-	-	-	5.6

See footnotes at end of table.

Table 12. Average Consumption per Household of Liquefied Petroleum Gas for the United States and by Region, 1978–1982 and 1984 (Continued) (Million Btu)

	1978	1979	1980	1981	1982	1984
			North Central			
Full Sample						
Average Consumption	79.6	74.1	73.3	60.9	60.4	69.7
Standard Error	16.1	13.4	5.6	8.6	5.4	4.2
Change in Consumption[1]	-	-5.5	-0.8	-12.3	-0.5	9.2
Dependent Sample Standard Error ..	-	10.2	-	9.7	11.3	7.8
Independent Sample Standard Error ..	-	-	6.7	-	-	-
Panel 1980-1982						
Average Consumption	-	-	65.1	-	60.6	-
Standard Error	-	-	7.1	-	8.7	-
Change in Consumption[2]	-	-	-	-	-4.5	-
Dependent Sample Standard Error ..	-	-	-	-	3.9	-
Panel 1982-1984						
Average Consumption	-	-	-	-	60.2	69.9
Standard Error	-	-	-	-	6.7	5.7
Change in Consumption[2]	-	-	-	-	-	9.7
Dependent Sample Standard Error ..	-	-	-	-	-	8.1

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 12. Average Consumption per Household of Liquefied Petroleum Gas for the United States and by Region, 1978-1982 and 1984 (Continued) (Million Btu)

	1978	1979	1980	1981	1982	1984
			South			
Full Sample						
Average Consumption	40.9	36.8	41.6	35.6	34.0	32.1
Standard Error	3.5	2.9	2.9	2.3	2.9	3.5
Change in Consumption[1]	-	-4.0	4.7	-6.0	-1.6	-1.9
Dependent Sample Standard Error	-	2.9	-	3.0	3.4	3.5
Independent Sample Standard Error	-	-	4.1	-	-	-
Panel 1980-1982						
Average Consumption	-	-	40.6	-	34.7	-
Standard Error	-	-	4.7	-	4.4	-
Change in Consumption[2]	-	-	-	-	-5.9	-
Dependent Sample Standard Error	-	-	-	-	3.5	-
Panel 1982-1984						
Average Consumption	-	-	-	-	33.3	35.9
Standard Error	-	-	-	-	3.6	6.6
Change in Consumption[2]	-	-	-	-	-	2.7
Dependent Sample Standard Error	-	-	-	-	-	3.9

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 12. Average Consumption per Household of Liquefied Petroleum Gas for the United States and by Region, 1978-1982 and 1984 (Continued) (Million Btu)

	1978	1979	1980	1981	1982	1984
			West			
Full Sample						
Average Consumption	66.5	76.4	49.4	53.8	42.7	39.4
Standard Error	18.9	16.7	3.9	8.0	4.3	3.1
Change in Consumption[2]	-	9.9	-27.0	4.5	-11.1	-3.3
Dependent Sample Standard Error ..	-	14.8	-	8.3	7.5	4.6
Independent Sample Standard Error ..	-	-	17.1	-	-	-
Panel 1980-1982						
Average Consumption	-	-	50.6	-	49.6	-
Standard Error	-	-	5.6	-	4.2	-
Change in Consumption[2]	-	-	-	-	-1.0	-
Dependent Sample Standard Error ..	-	-	-	-	4.6	-
Panel 1982-1984						
Average Consumption	-	-	-	-	35.4	38.5
Standard Error	-	-	-	-	5.6	5.1
Change in Consumption[2]	-	-	-	-	-	3.1
Dependent Sample Standard Error ..	-	-	-	-	-	7.1

[1]The change in consumption is from the preceding survey year to the year in the column. The change is for a 1-year interval for all years except for 1984 where the change is for the 2-year interval from 1982 to 1984.

[2]The change in consumption is for the 2-year period for the panel sample only.

Note: Numbers may not add to totals because of independent rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1979, 1980, 1982, and 1984.

Consumption of and Expenditures for Individual Energy Sources

Table 13. Average Expenditures per Household for Liquefied Petroleum Gas for the United States and by Region, 1978-1982 and 1984 (Dollars)

	1978	1979	1980	1981	1982	1984
			Total U.S.			
Full Sample						
Average Expenditures	241	294	377	373	372	398
Standard Error	16	22	18	21	18	17
Change in Expenditures[1] ...	-	53	83	-4	-1	26
Dependent Sample Standard Error ..	-	18	-	24	28	20
Independent Sample Standard Error ..	-	-	28	-	-	-
Panel 1980-1982						
Average Expenditures	-	-	351	-	372	-
Standard Error	-	-	22	-	24	-
Change in Expenditures[2] ...	-	-	-	-	21	-
Dependent Sample Standard Error ..	-	-	-	-	16	-
Panel 1982-1984						
Average Expenditures	-	-	-	-	371	400
Standard Error	-	-	-	-	24	28
Change in Expenditures[2] ...	-	-	-	-	-	29
Dependent Sample Standard Error ..	-	-	-	-	-	23

See footnotes at end of table.

Table 13. Average Expenditures per Household for Liquefied Petroleum Gas for the United States and by Region, 1978-1982 and 1984 (Continued) (Dollars)

	1978	1979	1980	1981	1982	1984
			Northeast			
Full Sample						
Average Expenditures	175	200	212	252	237	264
Standard Error	33	34	45	71	31	31
Change in Expenditures[1] ...	-	25	12	39	-15	27
Dependent Sample Standard Error ..	-	56	-	53	60	42
Independent Sample Standard Error ..	-	-	56	-	-	-
Panel 1980-1982						
Average Expenditures	-	-	206	-	214	-
Standard Error	-	-	49	-	44	-
Change in Expenditures[2] ...	-	-	-	-	8	-
Dependent Sample Standard Error ..	-	-	-	-	34	-
Panel 1982-1984						
Average Expenditures	-	-	-	-	262	283
Standard Error	-	-	-	-	55	38
Change in Expenditures[2] ...	-	-	-	-	-	22
Dependent Sample Standard Error ..	-	-	-	-	-	45

See footnotes at end of table.

Table 13. Average Expenditures per Household for Liquefied Petroleum Gas for the United States and by Region, 1978-1982 and 1984 (Continued) (Dollars)

	1978	1979	1980	1981	1982	1984
			North Central			
Full Sample						
Average Expenditures	362	450	541	487	510	604
Standard Error	70	72	40	65	47	31
Change in Expenditures[1] ...	-	88	91	-54	23	94
Dependent Sample Standard Error ..	-	50	-	70	92	62
Independent Sample Standard Error ..	-	-	82	-	-	-
Panel 1980-1982						
Average Expenditures	-	-	480	-	512	-
Standard Error	-	-	48	-	72	-
Change in Expenditures[2] ...	-	-	-	-	32	-
Dependent Sample Standard Error ..	-	-	-	-	37	-
Panel 1982-1984						
Average Expenditures	-	-	-	-	508	610
Standard Error	-	-	-	-	56	57
Change in Expenditures[2] ...	-	-	-	-	-	102
Dependent Sample Standard Error ..	-	-	-	-	-	61

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 13. Average Expenditures per Household for Liquefied Petroleum Gas for the United States and by Region, 1978-1982 and 1984 (Continued) (Dollars)

	1978	1979	1980	1981	1982	1984
			South			
Full Sample						
Average Expenditures	211	251	337	327	334	333
Standard Error	14	17	19	20	23	29
Change in Expenditures[1] ...	-	40	86	-10	7	-1
Dependent Sample Standard Error ..	-	14	-	24	28	28
Independent Sample Standard Error ..	-	-	19	-	-	-
Panel 1980-1982						
Average Expenditures	-	-	327	-	340	-
Standard Error	-	-	36	-	38	-
Change in Expenditures[2] ...	-	-	-	-	13	-
Dependent Sample Standard Error ..	-	-	-	-	29	-
Panel 1982-1984						
Average Expenditures	-	-	-	-	329	362
Standard Error	-	-	-	-	25	49
Change in Expenditures[2] ...	-	-	-	-	-	33
Dependent Sample Standard Error ..	-	-	-	-	-	31

See footnotes at end of table.

Consumption of and Expenditures for Individual Energy Sources

Table 13. Average Expenditures per Household for Liquefied Petroleum Gas for the United States and by Region, 1978-1982 and 1984 (Continued) (Dollars)

	1978	1979	1980	1981	1982	1984
			West			
Full Sample						
Average Expenditures	278	470	391	458	413	417
Standard Error	51	93	26	64	27	17
Change in Expenditures[1]	-	192	-79	67	-44	3
Dependent Sample Standard Error	-	80	-	64	63	35
Independent Sample Standard Error	-	-	97	-	-	-
Panel 1980-1982						
Average Expenditures	-	-	394	-	458	-
Standard Error	-	-	34	-	37	-
Change in Expenditures[2]	-	-	-	-	65	-
Dependent Sample Standard Error	-	-	-	-	36	-
Panel 1982-1984						
Average Expenditures	-	-	-	-	366	386
Standard Error	-	-	-	-	47	40
Change in Expenditures[2]	-	-	-	-	-	20
Dependent Sample Standard Error	-	-	-	-	-	60

[1]The change in expenditures is from the preceding survey year to the year in the column. The change is for a 1-year interval for all years except for 1984 where the change is for the 2-year interval from 1982 to 1984.

[2]The change in expenditures is for the 2-year period for the panel sample only.

Note: Numbers may not add to totals because of independent rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1979, 1980, 1982, and 1984.

Consumption of and Expenditures for Individual Energy Sources

Of all the fuels considered in this report, LPG was the one least frequently used (Table 14). Like natural gas, it can be used for cooking and clothes drying as well as for space and water heating. However, it is principally used in rural areas and by a small minority of households. The largest concentration of users was in the South, where 12.5 (±3.7) percent of the households used it in 1984, and in the North Central region, where about 8.9 (±2.4) percent used it.

In 1984, more than one-half of the households in the North Central and South regions using LPG used it as the main heating fuel. However, the mild winters in the South limited the amount of LPG that had to be used for heating, which contributed to the relatively low average consumption in this region. The extremely cold winters in the North Central region were coupled with the high proportion of houses using LPG as the main heating fuel were undoubtedly important reasons for this region having a high average consumption. The Northeast also had severe winters. However, very few homes used LPG as the main heating fuel in the Northeast, which was an important factor behind the low average consumption in this region. The dominant use of LPG in the Northeast was for cooking, which uses a relatively small amount of energy.

Table 14. Percentage of Households that Use LPG for Selected Purposes by Region, 1978 and 1984

End Use or Appliance	Northeast		North Central		South		West	
	1978	1984	1978	1984	1978	1984	1978	1984
Use LPG	7.5	7.4	7.2	8.9	15.0	12.5	3.1	5.2
Standard Error ...	(1.4)	(1.5)	(1.8)	(1.2)	(2.9)	(1.9)	(1.2)	(1.0)
Heating Fuel	0.7	1.5	4.4	7.5	9.9	8.9	2.2	3.0
Standard Error ...	(0.3)	(0.6)	(1.0)	(1.1)	(2.2)	(1.6)	(0.8)	(0.7)
Main Heating ...	0.5	0.9	3.8	5.8	8.1	7.0	Q	2.4
Standard Error .	(0.2)	(0.3)	(0.8)	(0.8)	(1.8)	(1.3)		(0.8)
Secondary Heating Only .	0.2	0.6	0.6	1.7	1.8	1.8	Q	0.6
Standard Error .	(0.1)	Q	(0.3)	(0.6)	(0.7)	(0.5)		(0.2)
Water Heating	3.2	2.9	4.0	5.4	6.2	5.4	Q	3.9
Standard Error ...	(1.1)	(0.8)	(1.3)	(0.9)	(1.7)	(1.3)		(0.8)
Cooking	6.8	6.3	4.6	5.4	11.2	8.3	Q	3.7
Standard Error ...	(1.8)	(1.6)	(1.2)	(0.9)	(2.4)	(1.5)		(1.1)
Clothes Dryer	0.8	1.0	1.1	1.8	0.7	1.1	Q	1.3
Standard Error ...	(0.4)	(0.3)	(0.4)	(0.7)	(0.2)	(0.3)		(0.6)

Q - Data withheld because of large variance (1.96 x Standard Error > Value).
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978 and 1984.

4. Distribution of Consumption and Expenditures

This chapter examines the relative importance of specific energy sources for the Nation and each region. The number of households that use a specific energy source as the main heating fuel will be considered, along with the relative contribution of each energy source to total consumption and expenditures. Total expenditures per household by main heating fuel will also be discussed. In this chapter, all consumption values for electricity, when total consumption is considered, are adjusted electricity.[15]

The following discussion is based on averages for consumption and expenditures for all households, whether or not they use the fuel. This contrasts with the preceding chapters where the discussion was based on averages only over households that used each energy source. The average over all households discussed in this chapter determines how the typical household's energy budget and consumption levels are allocated among the various energy sources. The average consumption or expenditure for each source has been divided by the average total consumption or expenditures for the major energy sources. Thus, the average consumption and expenditures for each energy source are expressed in terms of a percentage of the total consumption and expenditures for the average household.

Nation

Natural gas was the fuel preferred as main heating fuel by households across the Nation. Fifty-five percent (±3 in 1984) of the households used gas as the main heating fuel, and this percentage remained very stable from 1978 to 1984 (Figure 10). In 1978, fuel oil/kerosene were the fuels next most likely to be used as the main heating fuel; 22 (±3) percent of housing units used it as the primary heating fuel in 1978. Electricity came next, followed by LPG and other fuels, principally wood.

Two important shifts in fuels used as the main heating fuel occurred during the period from 1978 to 1984. There was an 8 (±3) percentage point decline in the proportion of homes with fuel oil/kerosene as the main heating fuel. As a result of this decline, the difference between the percentage of households heating with electricity and those heating with fuel oil/kerosene in 1984 was not statistically significant. The second important change was a 6 (±2) percentage point increase in the proportion of households using other fuels, which were principally wood, as the main heating fuel--from 3.5 (±1.1) percent in 1978 to 9.1 (±1.3) percent in 1984. The changes in the percentage of homes heated with LPG or electricity were small and not significant statistically.

Adjusted-electricity consumption accounted for about one-half the energy consumed in households across the Nation (Figure 11). Electricity consumption (as a percent of total consumption) increased by 5.4 (±2.9) percentage points,

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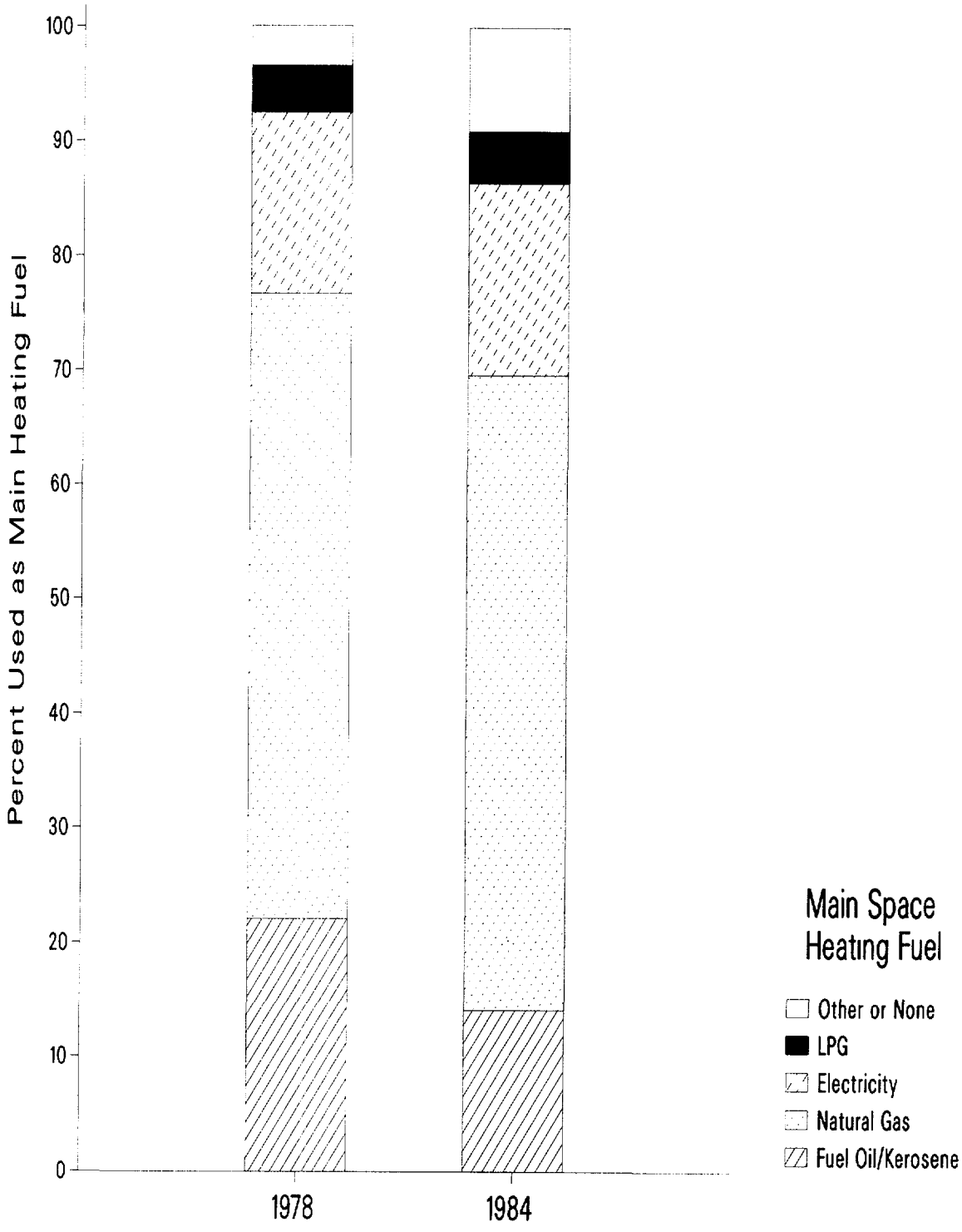
[15] As discussed in Chapter 2, there are difficulties in using either site-electricity values or adjusted-electricity values for estimating total energy consumption. Therefore, the choice of adjusted electricity is somewhat arbitrary. The reader can use the data in Chapter 5 to duplicate any of this discussion with site-electricity values.

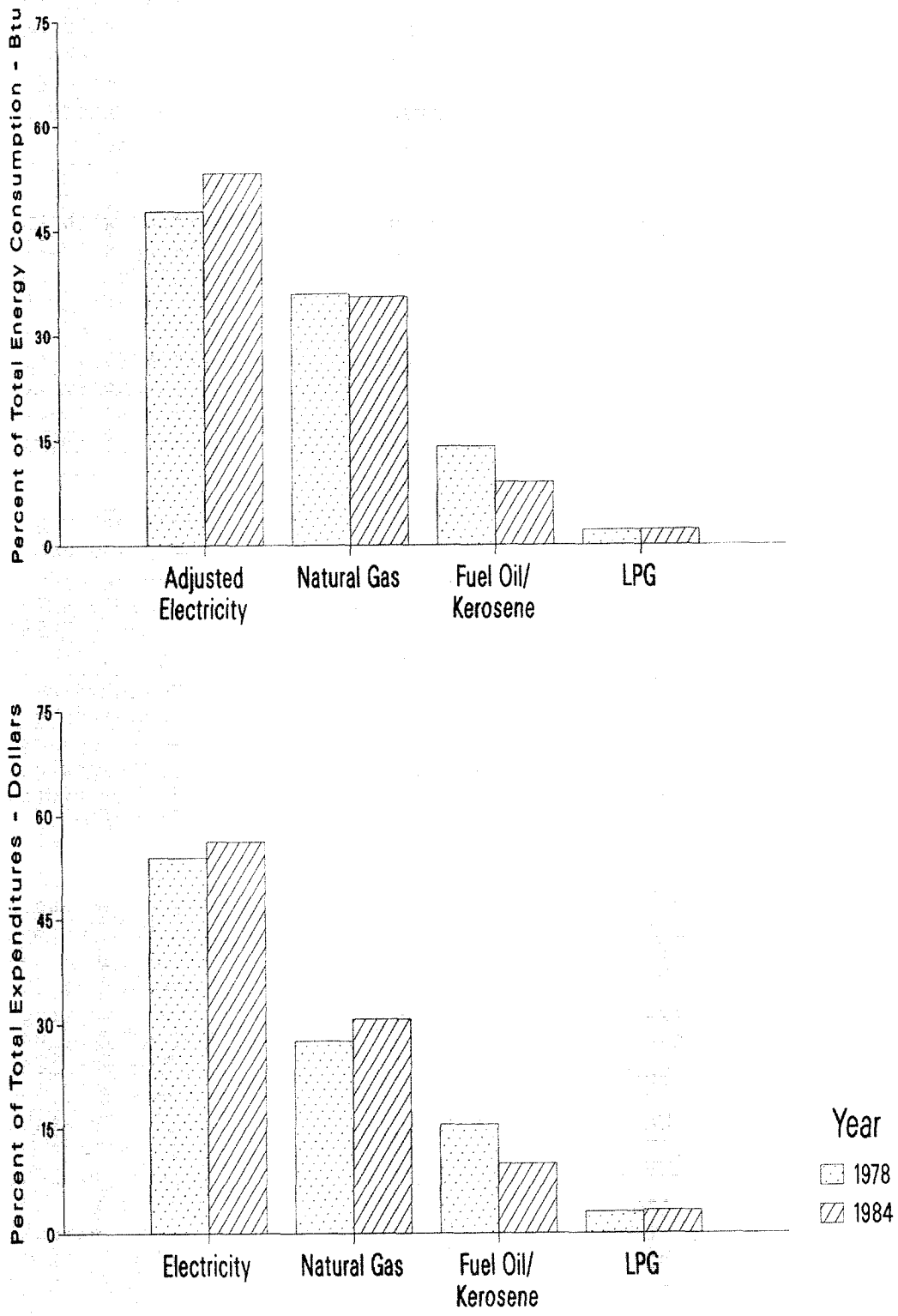
Figure 10. The U.S.: Distribution of Households by Main Space Heating Fuels, 1978 and 1984



Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978 and 1984.

Distribution of Consumption and Expenditures

Figure 11. The U.S.: Consumption and Expenditures for Specific Fuels as a Percentage of All Fuels, 1978 and 1984



Note: Adjusted Electricity is site electricity times 3. See Glossary.
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978 and 1984.

from 47.8 (±2.5) percent in 1978 to 53.2 (±1.5) percent in 1984. Natural gas share remained fixed at 36 percent (±3.3 in 1978). Most of the gain for electricity was at the expense of fuel oil/kerosene, whose share fell to 5.1 (±2.3) percent in 1984 from 14.1 (±2.2) percent in 1978. LPG remained fixed at about 2 percent of total consumption. (These figures for consumption do not include wood, because the difficulty involved in converting quantities of wood burned into useful Btu.)

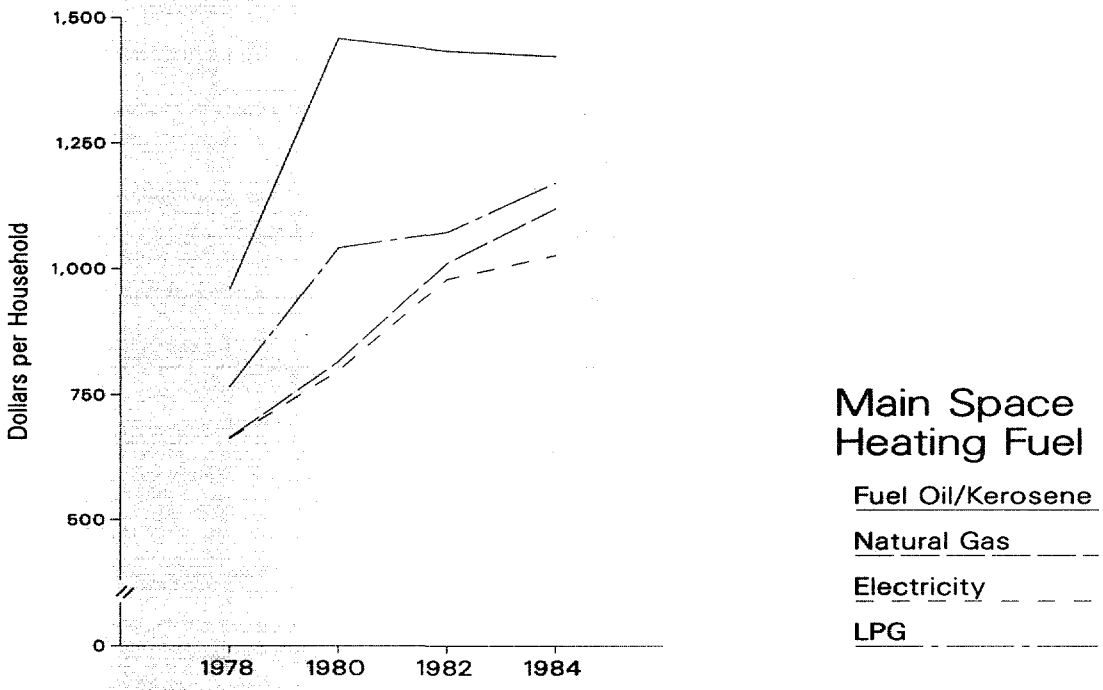
The picture for expenditures is similar to that for consumption, with the share of expenditures for electricity rising and those for fuel oil/kerosene falling (Figure 11). However, the decline in expenditures for fuel oil/kerosene of 5.6 (±2.9) percentage points (from 15.5 (±2.2) percent in 1978) was offset by an increase in expenditures for natural gas of 3.1 (±3.1) percentage points as well as for electricity, 2.3 (±2.2) percentage points. These increases were just marginally statistically significant. In 1984, electricity accounted for 56.2 (±1.3) percent of household expenditures for energy, while natural gas totaled 30.7 (±1.7) percent. Expenditures for LPG were about 3 percent of total expenditures.

Households that used fuel oil/kerosene as the main heating fuel had the highest average expenditures for all home energy among the major energy sources used for heating, excluding wood (Figure 12). Expenditures for these households increased by $463 (±67) from 1978 to 1984, although they had essentially stabilized by 1980. Households that heated with LPG had the next highest level of expenditures for home fuels. In 1978, home energy expenditures for these households averaged $765 (±96), which was $194 (±106) less than average expenditures in that year for households heating with fuel oil/kerosene. Households that heated with natural gas or electricity apparently had the lowest average total expenditures. However, the differences in expenditures between these households and LPG-heated households is not statistically significant.

Northeast

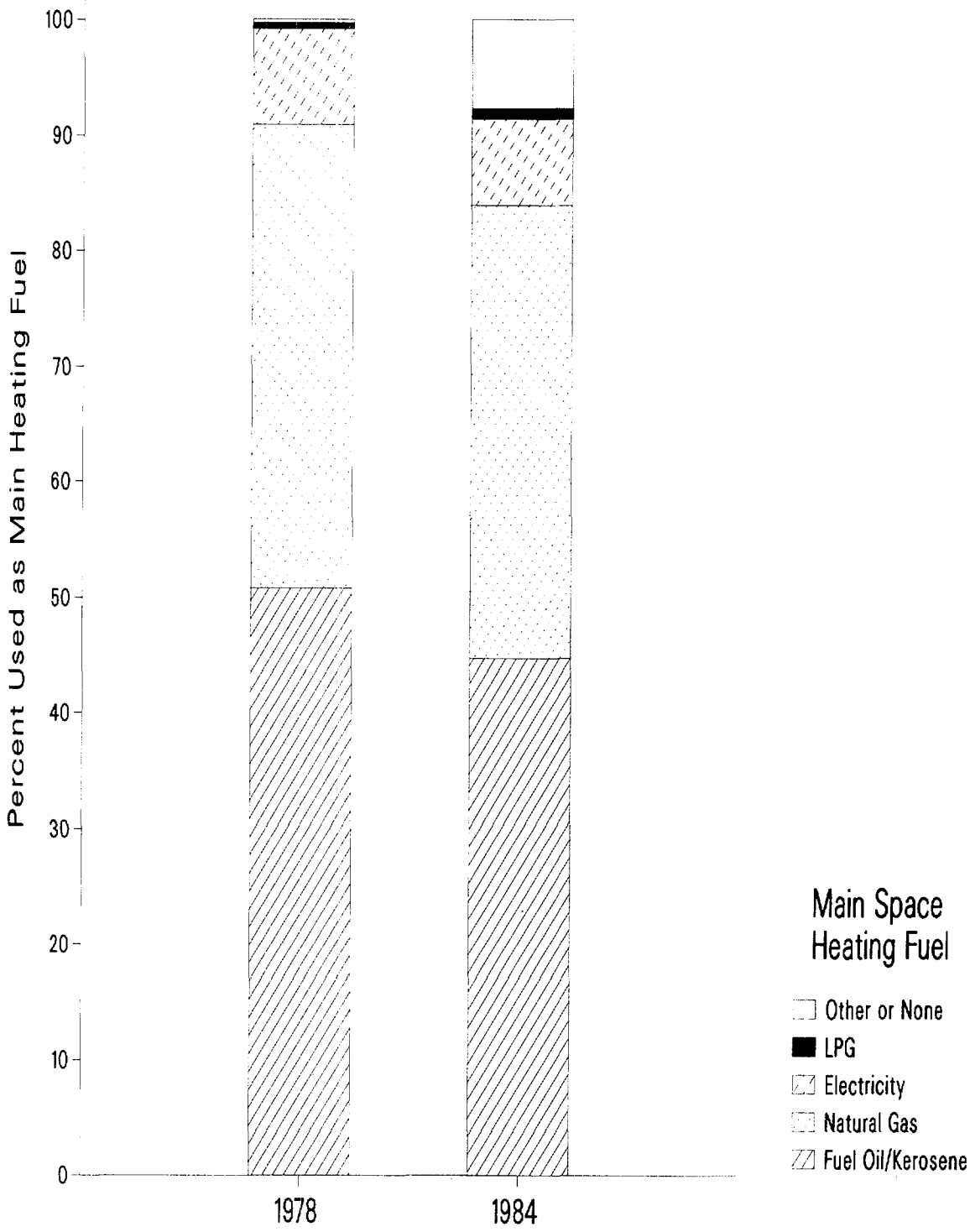
In colder sections of the country, such as the Northeast, the major use for energy is heating the home. Therefore, the mix of fuels used for the main space heating fuel will strongly influence the relative proportion of fuels consumed in the region. In 1978, slightly more than half (51 (±9) percent) of the households in the Northeast used fuel oil/kerosene as their main heating fuel (Figure 13). In 1984, the proportion of homes heated by fuel oil/kerosene appeared to have fallen some (by 6 (±10) percentage points), but the difference was not statistically significant. Use of natural gas, the fuel used next most intensively as the main heating fuel in the region, remained fairly stable in the neighborhood of 40 (±7 in 1978) percent. Electricity was the main heating fuel of a small, but also fairly stable 8 (±6 in 1978) percent of households. The most dramatic change in the pattern of fuel use for space heating was the increased use of "other" fuels, principally wood. Used in a statistically insignificant number of homes in 1978, by 1984 the use of wood and other fuels rose to 6 (±3) percent of all households.

Figure 12. The U.S.: Expenditures for Major Fuels by Main Space Heating Fuel, 1978,1980,1982, and 1984



Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

Figure 13. The Northeast: Distribution of Households by Main Space Heating Fuels, 1978 and 1984



Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978 and 1984.

Fuel oil/kerosene, with the largest proportion of households using it for space heating, appeared to have the largest share of consumption, 36.1 (±6.2) percent, in 1978 (Figure 14). However, the difference between the share for fuel oil/kerosene and that for adjusted electricity, 31.9 (±4.2) percent, and natural gas, 31.2 (±51) was not statistically significant. LPG had a minuscule share of around 1 percent. By 1984, however, the shifts in relative consumption levels left the adjusted electricity category with the highest proportion of energy consumption, 39.4 (±2.9) percent. This share was statistically significantly larger than both fuel oil/kerosene, 26.5 (±2.7) percent, and natural gas, 26.1 (±3.9), which were statistically indistinguishable.

Electricity and fuel oil/kerosene each accounted for more than 35 percent of average total expenditures for energy by Northeast households in 1978 (Figure 14. Natural gas was about 25 percent of the total, and LPG was about 2 percent. By 1984, relative expenditures for electricity had grown, so that it accounted for almost one-half, 46.1 (±2.5) percent, of total expenditures. The shares for fuel oil/kerosene and natural gas were indistinguishable, and significantly lower than for electricity, at slightly more than one-fourth the total.

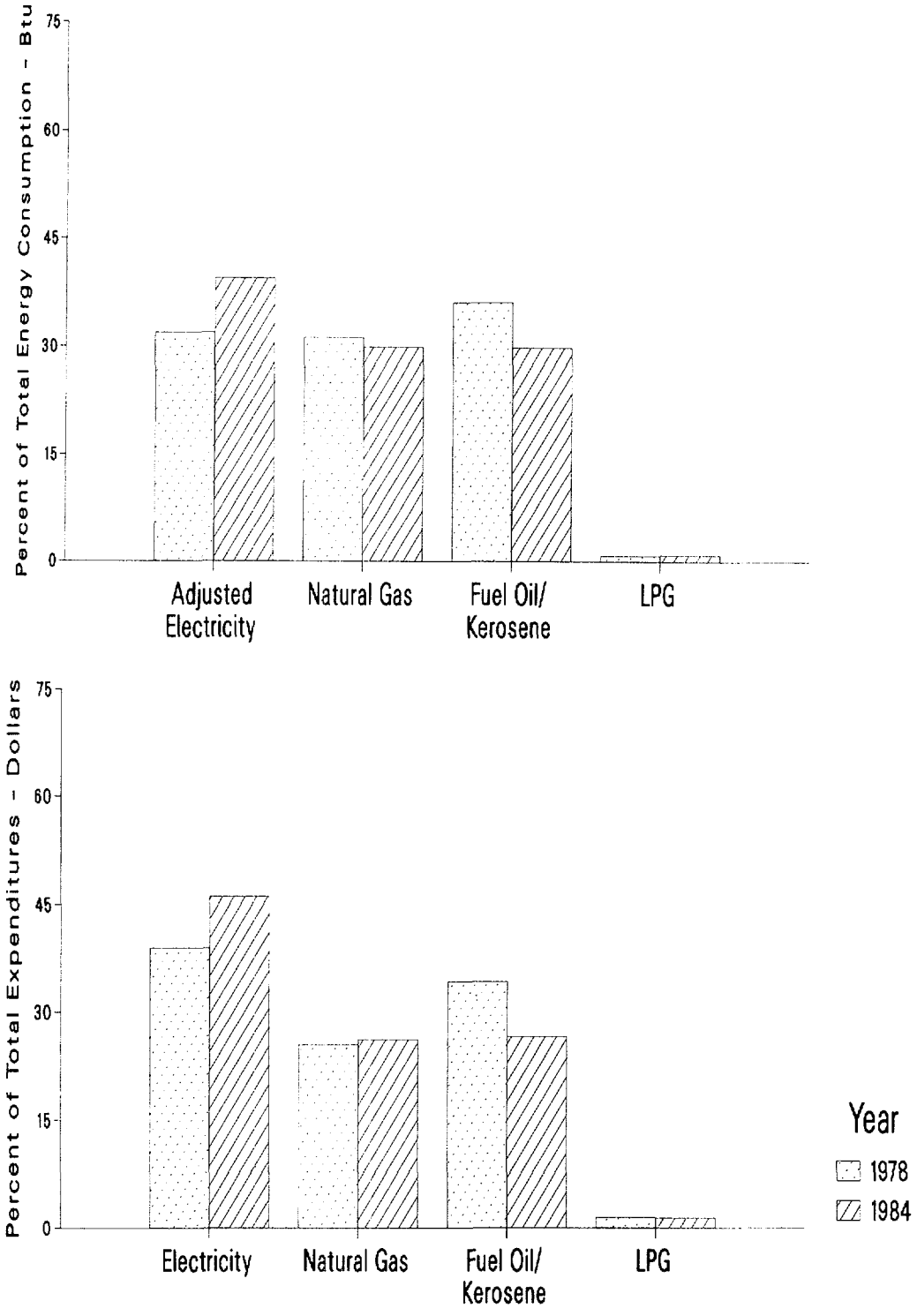
Households that heated their homes with fuel oil/kerosene had by far the largest average expenditures for major energy sources in 1978, $1,008 (±59) (Figure 15). Households that heated with natural gas or electricity had statistically significant lower expenditures in 1978. Expenditures for households heating with fuel oil/kerosene flattened out after 1980, while those for natural gas and electrically-heated homes continued to grow. By 1984, there were no statistically significant differences in total-expenditure for major energy sources among households with the different heating fuels.

North Central

Natural gas was clearly the fuel of preference for home heating among households in the North Central region (Figure 16). About 75 percent of the households used gas for heating and this figure remained fairly stable from 1978 to 1984. Fuel oil/kerosene was used by 15 (±7) percent in 1978, but fell by 10 (±4) percentage points by 1984. Electricity and LPG were used by about 5 percent of the households, with no statistically significant change over the period. By 1984, the number of households heating with these fuels was statistically indistinguishable from the number heating with fuel oil/kerosene. The use of wood and other fuels showed a sizeable increase in this region, increasing by 5 (±1) percentage points from 1 percent of the households to 6 (±1) percent. In 1984, wood was used by about the same percentage of households as the other fuels except for natural gas.

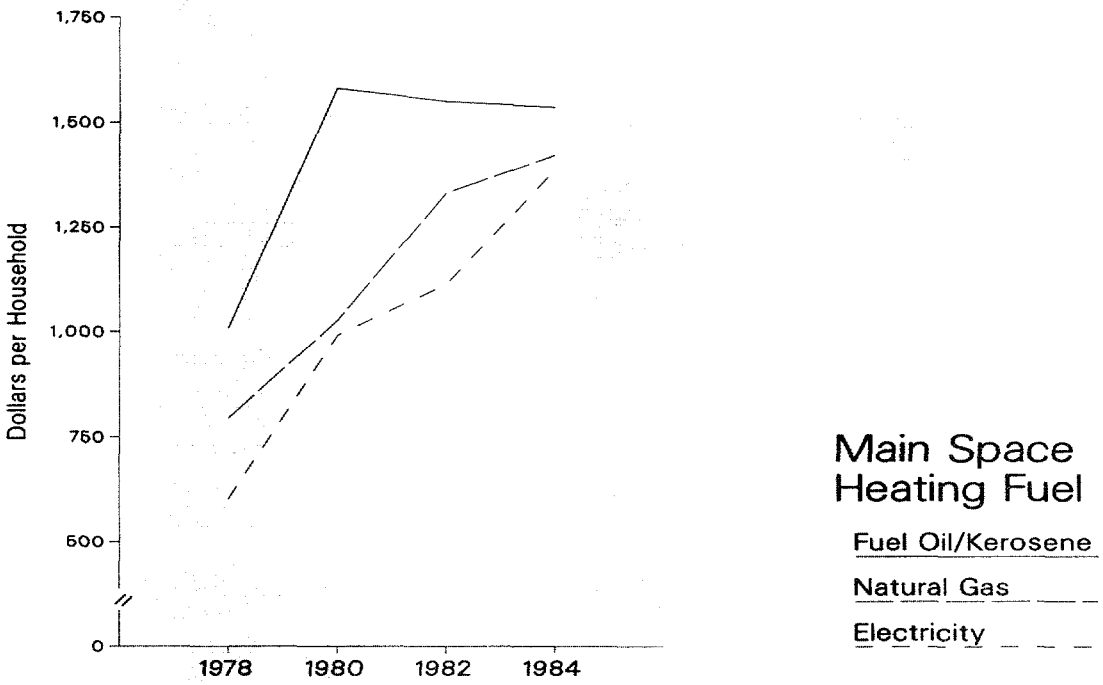
Given the intensive use of natural gas as the main space heating fuel in the region with the coldest weather, it is not surprising to find this fuel accounting for the largest share of consumption in the North Central region. Natural gas persistently accounted for slightly more than one-half of average total energy consumption (51.2 (±2.9) percent in 1984) (Figure 17). Adjusted-electricity consumption was next at 42.1 (±2.9) percent in 1984, which was an increase of 5.6 (±5.0) percentage points over the 1978 portion. The share of consumption for fuel oil fell by 6.2 (±4.4) percentage points to 3.3 (±.8) percent in 1984, while LPG remained fairly stable at a few percent.

Figure 14. The Northeast: Consumption and Expenditures for Specific Fuels as a Percentage of All Fuels, 1978 and 1984



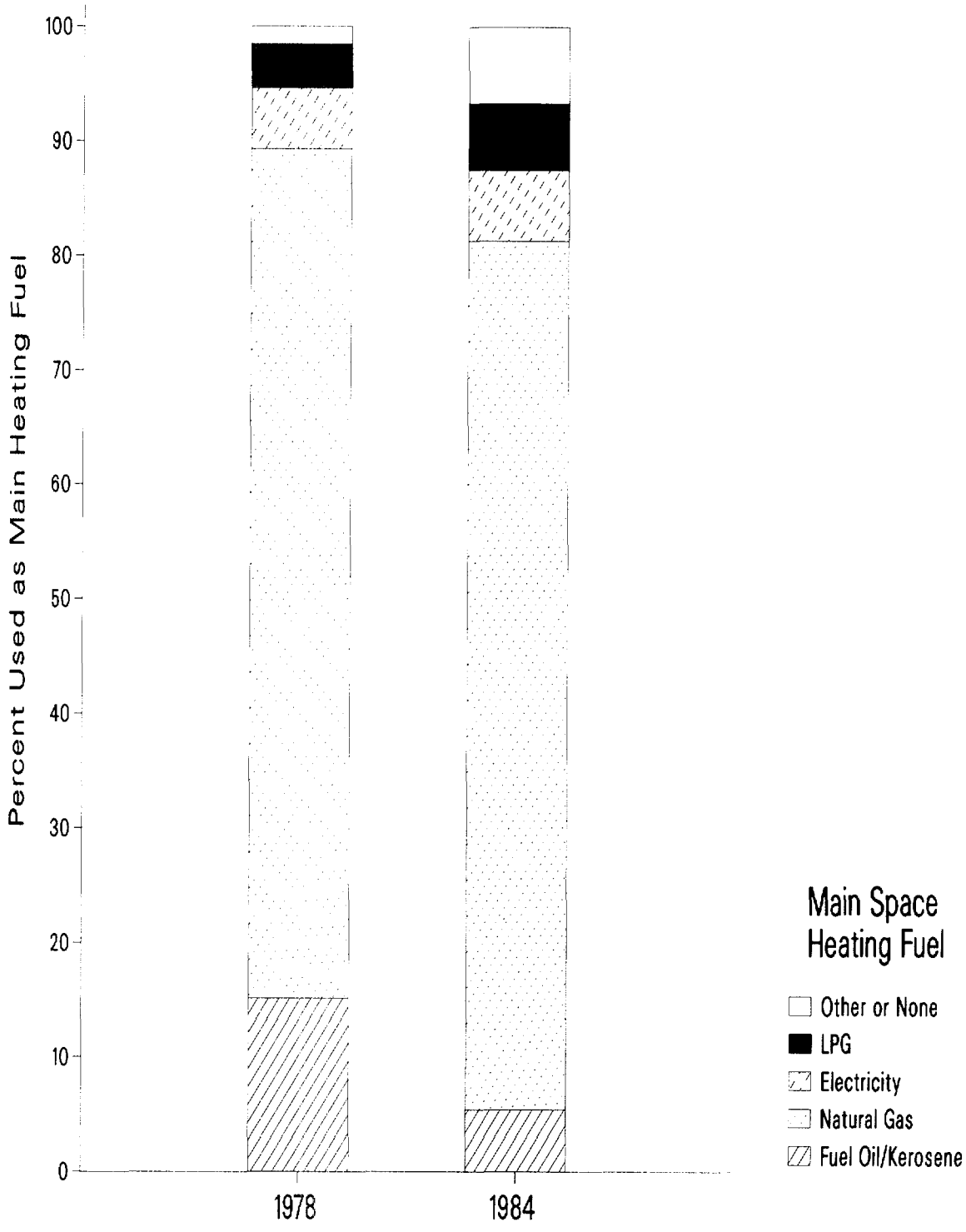
Note: Adjusted Electricity is site electricity times 3. See Glossary.
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978 and 1984.

Figure 15. The Northeast: Expenditures for Major Fuels by Main Space Heating Fuel, 1978,1980,1982, and 1984



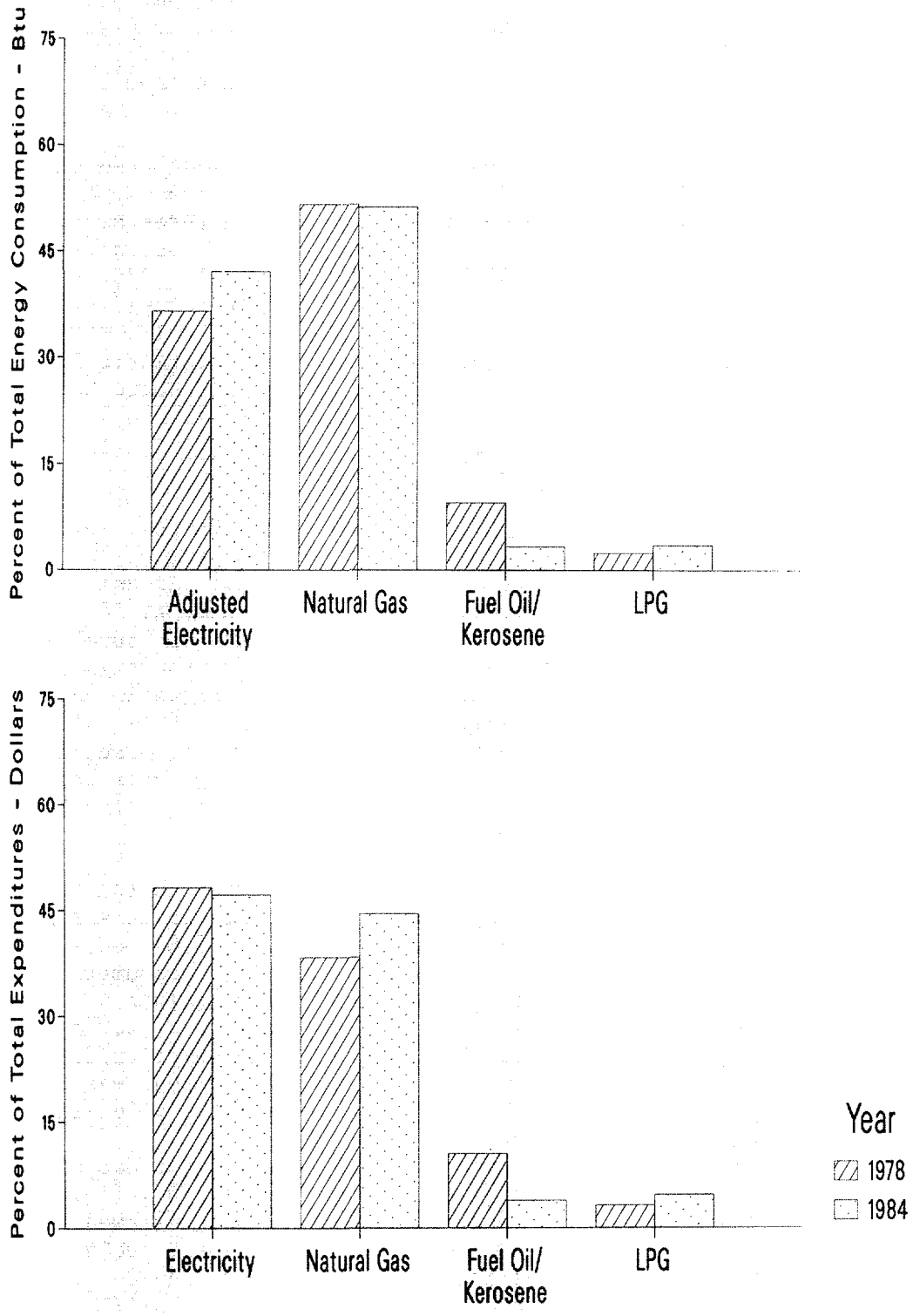
Note: Data for LPG-heated homes withheld due to large variance.
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

Figure 16. The North Central: Distribution of Households by Main Space Heating Fuels, 1978 and 1984



Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978 and 1984.

Figure 17. The North Central: Consumption and Expenditures for Specific Fuels as a Percentage of All Fuels, 1978 and 1984



Note: Adjusted electricity is site electricity times 3. See Glossary.
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978 and 1984.

As the more expensive fuel, electricity accounted for a large share of average total expenditures for energy in the North Central region. Its share remained fairly stable at slightly less than one-half of total expenditures, 47.1 (±2.9) percent in 1984 (Figure 17). Natural gas also had a sizeable share of expenditures that was not statistically significantly lower than that of electricity.

Households that heated with fuel oil/kerosene, LPG, and electricity had the highest average total expenditures for major energy sources in the North Central region in 1978 (Figure 18). The differences in average expenditures among these households were not statistically significant. Households that heated with natural gas, though, did have significantly lower expenditures in 1978, $781 (±34), than did the other households. Households heating with natural gas experienced a large increase in total expenditures, $373 (±68), which raised their expenditures to $1,154 (±59) in 1984. In 1984, there were no statistically significant differences in average total expenditures among households heating with the major energy sources.

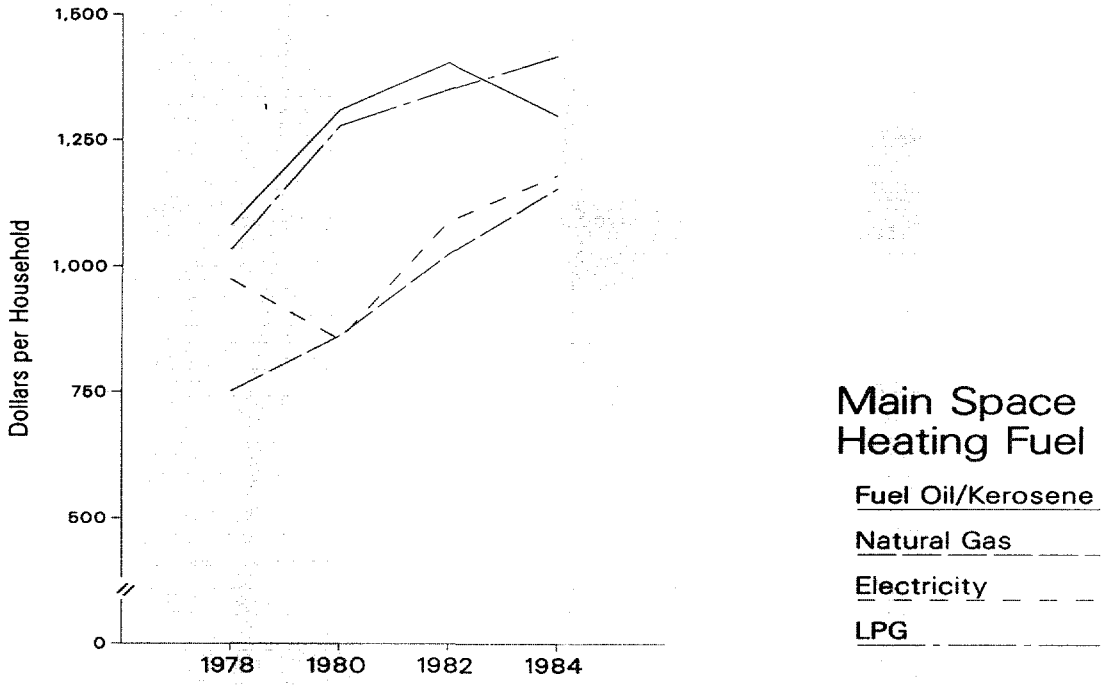
South

Natural gas was the fuel used as the main heating fuel by the largest number of households in the South (Figure 19). In 1984, 44.7 (±5.9) percent of the households used it, which was a slight, but statistically insignificant, increase over the proportion in 1978. Electricity followed, used by 28.7 (±5.7) percent of households in 1984. This relatively high proportion of households using electricity as the main space heating fuel contributed to the high level of consumption for this fuel in the South (Chapter 3). Fuel oil/kerosene came next in 1978, but a decline in the number of households using them (8.9 (± 5.5) percentage points), coupled with a 4.6 (±3.6) percentage point increase in the proportion of households using wood or other fuels, led to these fuels being grouped with LPG as having about the same number of users for main space heating fuel in 1984.

Consumption of adjusted electricity dominated energy consumption in the South, accounting for 69.0 (±3.2) percent of average total consumption in this region in 1984 (Figure 20). Natural gas came next, comprising 24.9 (±3.8) percent of consumption in 1984. The small increases in the proportions of consumption for both of these fuels from 1978 to 1984 were not statistically significant. The only statistically significant change, albeit a relative small one, was a decline of 3.7 (±2.9) percentage points in the fraction of consumption accounted for by fuel oil/kerosene. In 1984, consumption of fuel oil/kerosene was 3.5 (±1.2) percent of the total, not significantly different from the value for LPG.

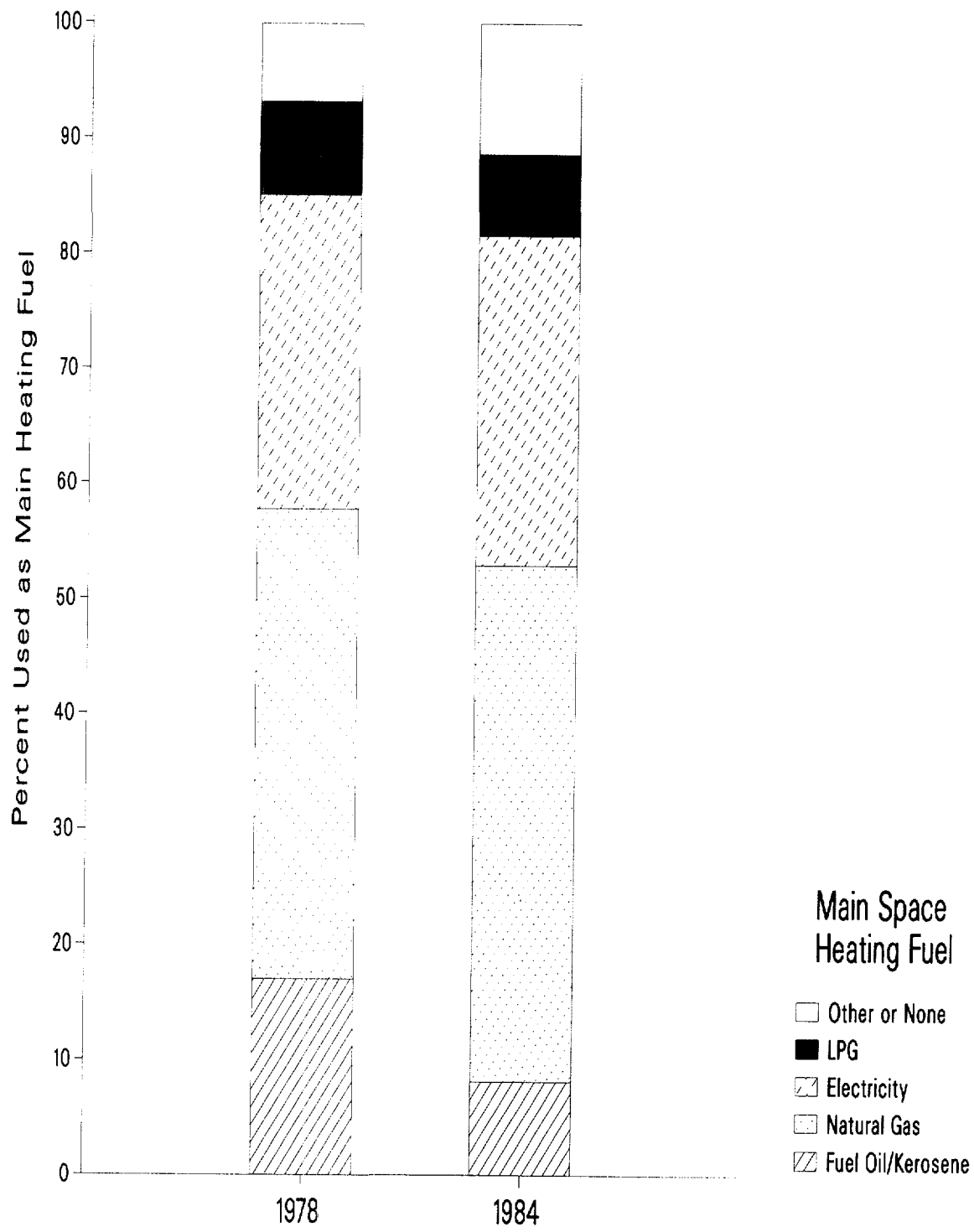
The distribution of expenditures by fuel type of total expenditures was similar to that for consumption. Electricity dominated, accounting for 70.1 (±3.2) percent of total expenditures in 1984 (Figure 20). Natural gas followed at 21.6 (±3.4) percent in 1984. The changes in percentages for both these fuels from 1978 to 1984 were not statistically significant. Fuel oil/kerosene and LPG each accounted for about 4 percent of total expenditures in 1984, fuel oil/kerosene having dropped a small, but statistically significant 3.3 (±2.9) percentage points from its 1978 proportion.

Figure 18. The North Central: Expenditures for Major Fuels by Main Space Heating Fuel, 1978,1980,1982, and 1984



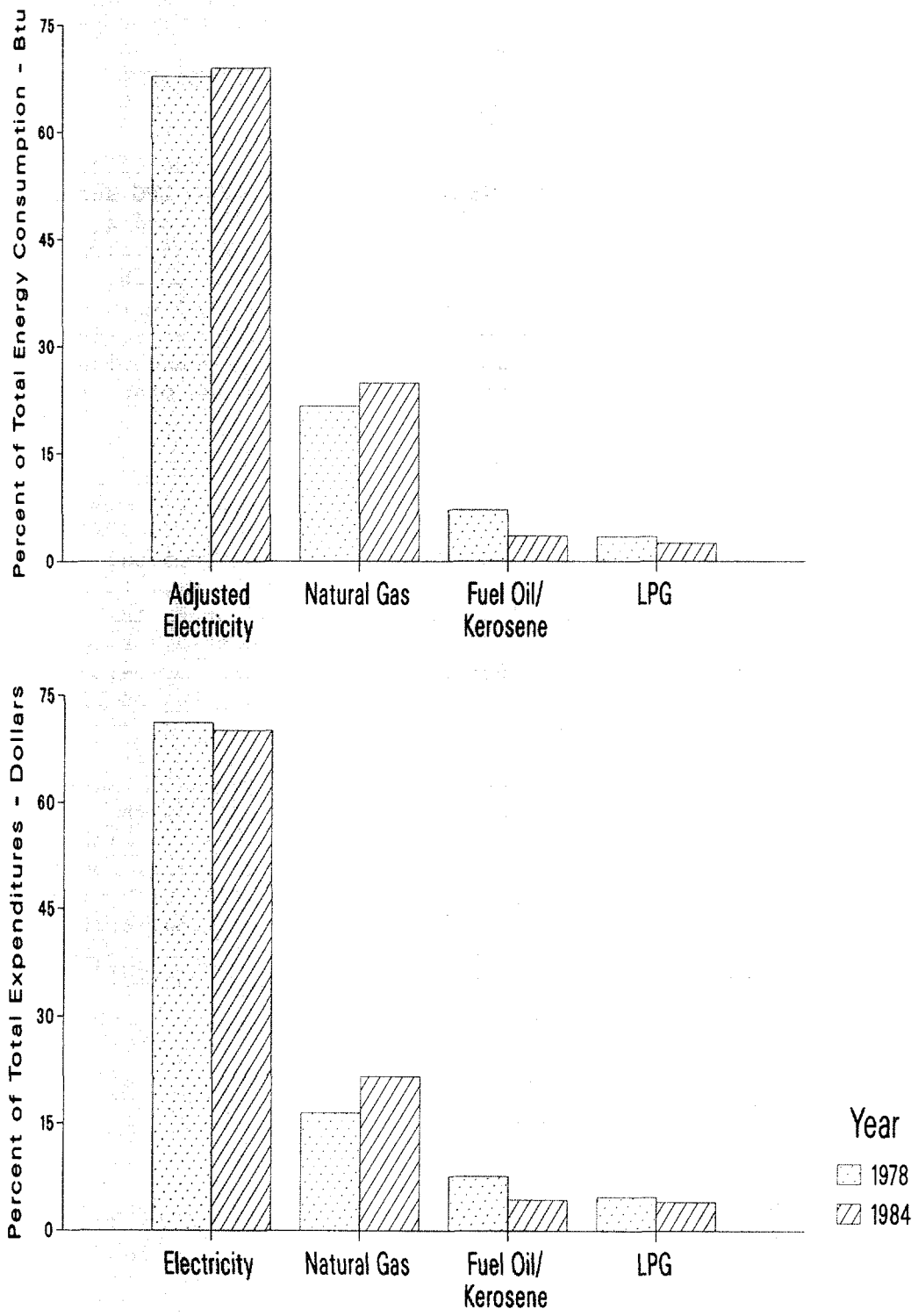
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

Figure 19. The South: Distribution of Households by Main Space Heating Fuels, 1978 and 1984



Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978 and 1984.

Figure 20. The South: Consumption and Expenditures for Specific Fuels as a Percentage of All Fuels, 1978 and 1984



Note: Adjusted Electricity is site electricity times 3. See Glossary.
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978 and 1984.

The few households that did use fuel oil/kerosene as the main space heating fuel appeared to have the highest level of average total expenditures for major energy sources fuels among householders in the South (Figure 21). However, both in 1978 and in 1984 there were no statistically significant differences in expenditures among households heating with different energy sources.

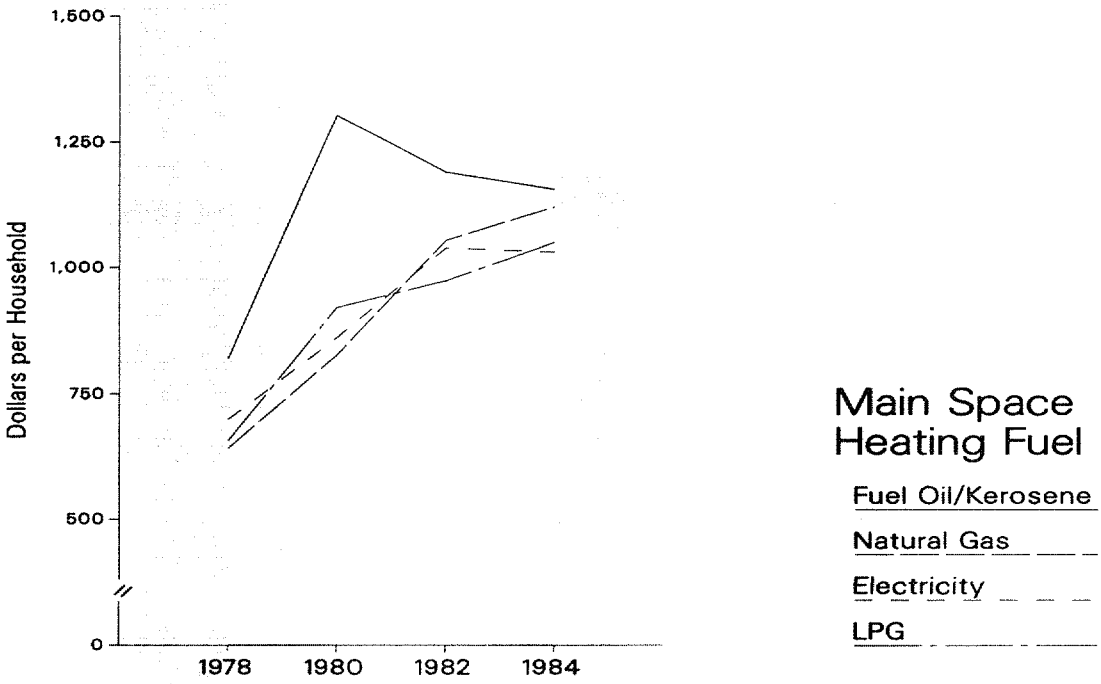
West

The energy situation in the West region was similar to that in the South; natural gas and electricity were the principal fuels used, while LPG and fuel oil/kerosene were fairly unimportant. In 1984, natural gas was used as the main heating fuel by 65.3 (±5.2) percent of the households, and electricity was used by 19.8 (±4.2) percent (Figure 22). The changes from 1978 to 1984 in the proportion of households using these energy sources as the main heating fuel were small and statistically insignificant. As with the other regions, there was a significant increase of 5.6 (±3.6) percentage points in the proportion of households using wood or other fuels as the main heating fuel. By 1984, wood and other fuels were used by 9.8 (±2.4) percent of the households, more than either fuel oil/kerosene or LPG.

Adjusted-electricity consumption accounted for more than one-half of the average household's energy consumption, 58.6 (±2.6) percent of the total in 1984 (Figure 23). Natural gas accounted for the bulk of the remaining consumption, 38.3 (±3.2) percent. Changes in the distribution of consumption by fuel type between 1978 and 1984 were statistically insignificant. For expenditures, the picture was virtually the same as for consumption. Electricity accounted for 60.6 (±2.6) percent of total expenditures and natural gas accounted for 34.8 (±3.1) percent in 1984. There was essentially no change in the distribution of expenditures by fuel type between 1978 and 1984.

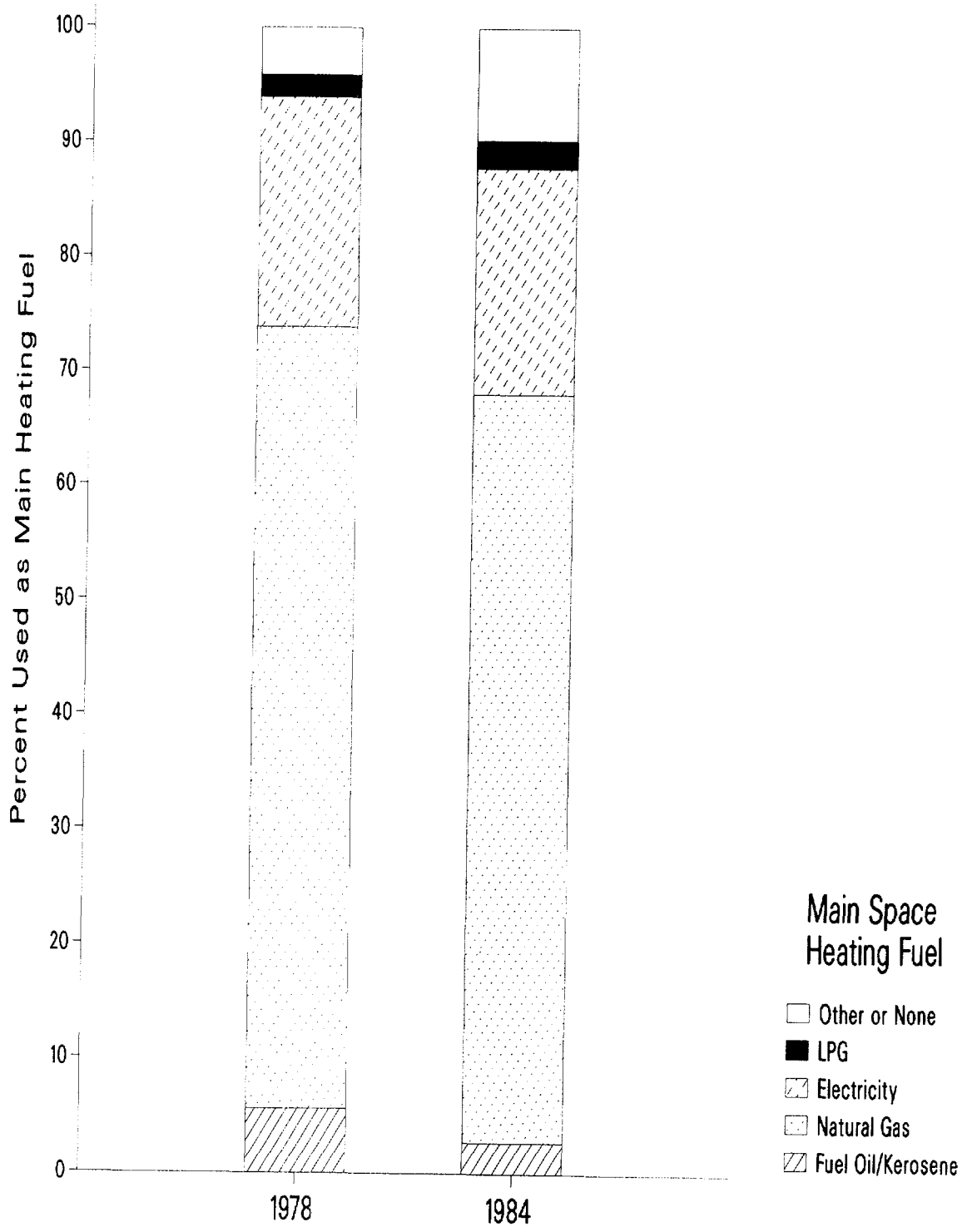
The few households heating with fuel oil/kerosene or LPG apparently spent much more for their total fuel bill than did those households heating with electricity or natural gas in 1978 (Figure 24). Households heating with fuel oil/kerosene spent a total of $1,124 (±106) in 1984 for major energy sources, which was statistically significantly higher than for households with electricity or natural gas. The differences in expenditures between households heating with LPG and other fuels were not statistically significant because of the high variance associated with expenditures for households heating with LPG.

Figure 21. The South: Expenditures for Major Fuels by Main Space Heating Fuel, 1978,1980,1982, and 1984



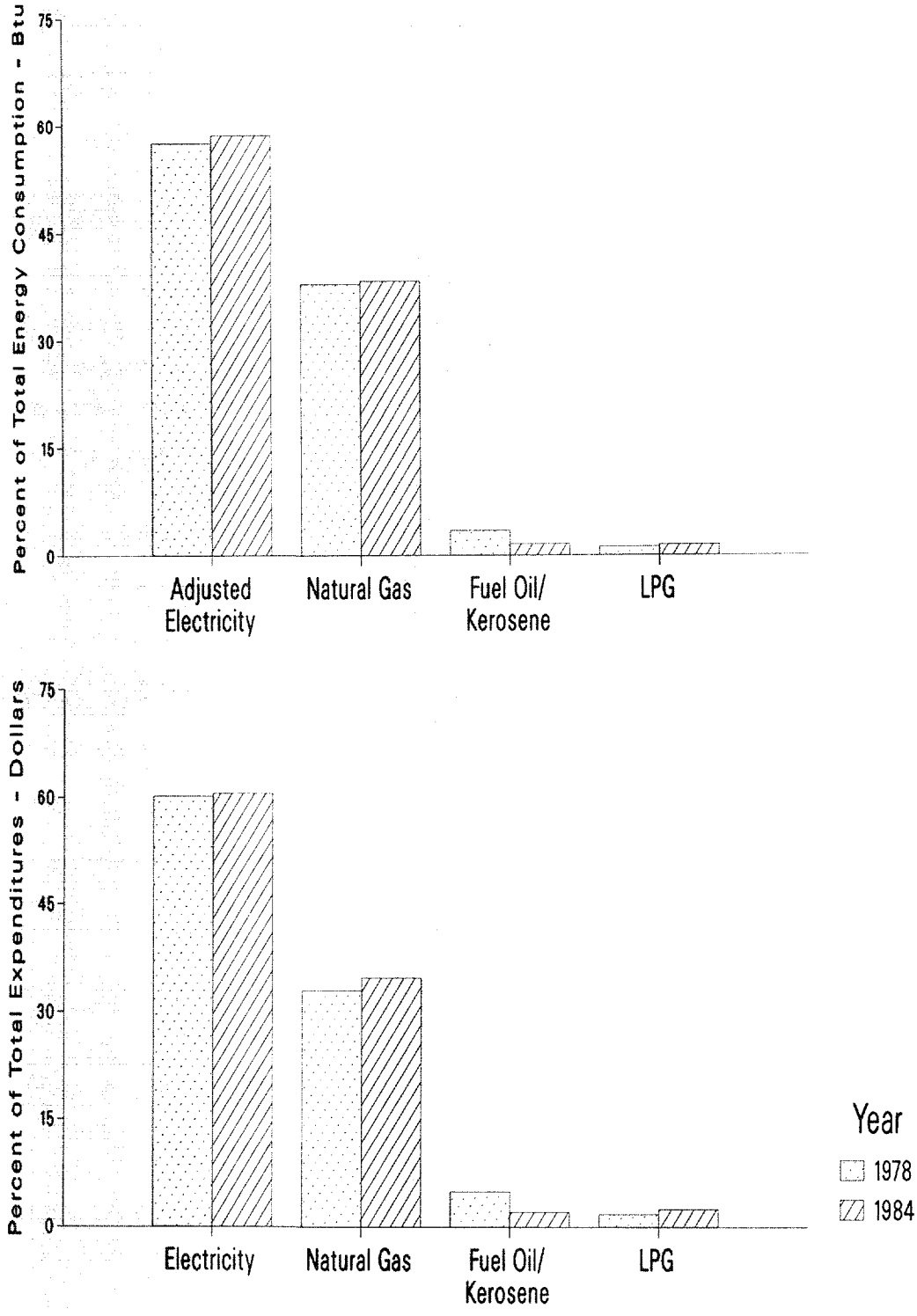
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys 1978, 1980, 1982 and 1984.

Figure 22. The West: Distribution of Households by Main Space Heating Fuels, 1978 and 1984



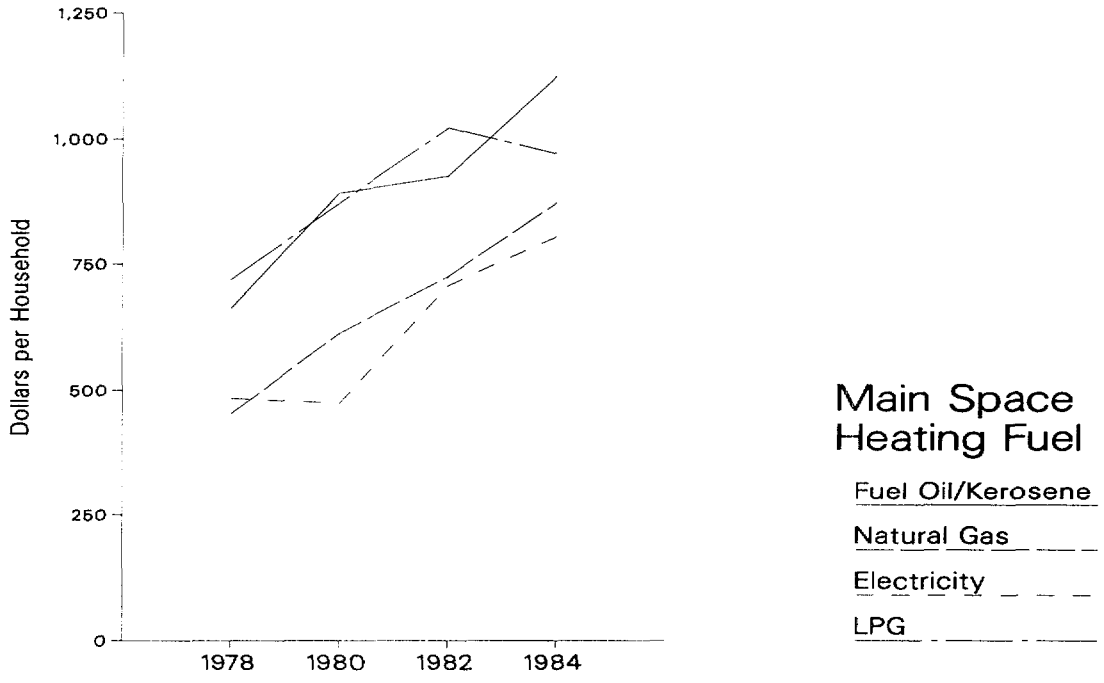
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978 and 1984.

Figure 23. The West: Consumption and Expenditures for Specific Fuels as a Percentage of All Fuels, 1978 and 1984



Note: Adjusted Electricity is site electricity times 3. See Glossary.
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978 and 1984.

Figure 24. The West: Expenditures for Major Fuels by Main Space Heating Fuel, 1978,1980,1982, and 1984



Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Resdiential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

5. Detailed Statistics

This chapter provides a detailed set of statistics on energy use per household for the RECS conducted in 1978, 1980, 1982, and 1984. Data on average consumption per household for all fuels, average expenditures for all fuels and household counts are tabulated by a variety of household characteristics. The first set of tables are followed by a corresponding set of tables for each of the four major fuels considered in this report: natural gas, electricity, fuel oil/kerosene, and LPG.

Each of these tables gives the average value for the statistic in question. Estimates are also provided for the variance associated with each statistic for that year by giving relative standard error (RSE) row and column factors in each table. The RSE for a particular statistic is calculated by taking the product of the appropriate column factor and row factor. The estimated standard error for a statistic is the product of the statistic and the estimated RSE divided by 100. The procedures for making these estimates of the standard error are described in Appendix A. This appendix also discusses the statistical issues involved in making year-to-year comparisons.

Detailed Statistics

Table 15. Average Residential Consumption for Major Fuels, 1978 Through 1984

United States

Household Characteristics	Million Btu per Household				Adjusted Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.45	0.94	1.11	0.99	1.26	0.72	0.89	0.83	
All Households	137.9	114.2	102.9	104.7	202.3	174.4	160.8	162.2	1.55
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	162.3	125.3	112.4	113.8	224.1	181.9	163.4	163.4	5.25
5,500 to 7,000 HDD	167.4	140.7	122.8	134.7	225.1	192.2	174.4	185.5	2.12
4,000 to 5,499 HDD	157.9	122.5	109.1	111.0	219.1	181.7	165.4	166.9	3.04
Fewer than 4,000 HDD	98.8	89.5	85.3	82.5	168.8	148.3	142.2	141.2	2.66
More than 2,000 CDD and Fewer than 4,000 HDD	91.3	84.7	80.1	72.7	167.5	166.8	157.3	147.4	5.92
Year of Construction									
Before 1950	154.2	128.8	113.5	121.3	202.8	173.7	156.7	165.4	1.85
1950 to 1974	127.4	112.0	101.3	99.5	201.0	177.0	163.4	161.2	1.95
After 1974	113.4	82.1	82.9	82.8	209.3	167.4	162.3	158.2	D
Main Space Heating Fuel									
Electricity	76.4	60.3	61.7	55.3	215.2	171.1	170.9	158.3	3.73
Natural Gas	150.8	130.9	118.3	123.5	197.2	178.2	163.4	169.9	1.50
Fuel Oil/Kerosene	168.1	144.9	125.0	126.2	224.5	193.3	172.8	171.5	2.08
LPG	113.3	105.2	85.9	88.6	179.6	160.3	140.2	143.1	4.35
Wood	54.8	54.8	52.8	59.9	124.2	124.6	120.9	125.5	3.87
Other or None	38.3	39.1	37.2	37.3	78.0	88.0	89.7	84.2	8.23
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	85.6	75.7	76.5	--	127.1	117.9	116.3	1.87
1,000 to 1,999	--	115.8	104.1	106.9	--	180.4	166.6	171.5	1.64
2,000 or More	--	153.9	146.8	149.9	--	234.6	222.0	224.5	2.01
Air Conditioning									
Yes	143.9	116.1	106.0	106.3	217.2	186.2	174.6	172.6	1.86
No	130.3	111.5	98.7	102.3	183.5	158.7	141.7	146.9	2.12
Main Water Heating Fuel									
Electricity	108.2	79.7	75.1	75.3	216.7	173.8	164.9	163.0	2.69
Natural Gas	150.8	130.2	118.0	122.7	194.5	175.9	161.8	166.2	1.57
Fuel Oil/Kerosene	189.5	154.8	128.6	131.2	224.4	188.4	162.2	163.7	2.66
LPG	122.6	101.0	87.5	88.3	173.8	151.2	132.3	129.2	4.88
Other or None	46.5	50.3	41.7	44.3	84.6	92.1	93.0	92.1	14.16
Ownership Status									
Own	152.3	124.9	112.7	115.8	227.3	194.5	178.1	182.4	1.63
Rent	109.2	92.8	85.3	84.9	152.5	134.6	129.4	126.3	2.10
Annual Family Income									
Under $10,000	117.5	101.4	88.2	93.1	162.3	145.6	130.3	135.7	2.43
$10,000 to $19,999	130.6	106.6	96.3	95.2	196.3	163.4	149.9	144.9	1.85
$20,000 to $29,999	156.6	124.1	105.5	102.6	232.9	193.4	168.2	161.7	2.02
$30,000 or More	184.2	137.1	124.7	124.3	280.4	219.8	201.0	200.3	2.31
Number of People in Household									
Single Person	99.7	86.3	80.2	84.3	136.0	124.4	116.5	119.6	2.36
2 to 4 People	139.7	116.2	105.8	106.7	207.0	178.6	167.4	168.8	1.62
5 or More People	181.2	144.0	130.0	133.8	269.7	225.9	208.1	210.3	2.53
Age of Household Head									
Less than 25 Years	105.7	85.4	75.7	79.7	150.0	132.0	118.0	125.9	3.39
25 to 59 Years	146.0	118.4	106.7	107.9	218.1	184.4	170.5	170.6	1.67
60 Years or Older	129.5	112.5	101.3	103.8	182.9	163.1	149.9	153.1	2.00

See footnotes at end of table.

Table 15. Average Residential Consumption for Major Fuels, 1978 Through 1984 (Continued)

Northeast

Household Characteristics	Million Btu per Household				Adjusted Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.45	0.94	1.11	0.99	1.26	0.72	0.89	0.83	
All Households	166.3	137.7	121.7	125.2	211.3	182.0	164.1	169.9	2.59
Census Division									
New England	--	132.3	120.1	127.6	--	177.0	165.1	172.9	3.59
Middle Atlantic	--	139.4	122.1	124.5	--	183.6	163.7	169.0	3.01
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	Q	112.4	90.4	105.9	Q	172.4	139.2	159.6	7.29
5,500 to 7,000 HDD	179.2	137.1	121.1	133.7	227.3	184.3	168.2	181.6	3.53
4,000 to 5,499 HDD	166.9	143.6	128.3	121.4	206.2	181.8	165.0	160.7	3.07
Year of Construction									
Before 1950	175.3	146.8	126.3	134.4	211.1	181.4	161.1	169.7	2.85
1950 to 1974	165.3	136.5	119.8	119.7	221.8	188.2	167.4	172.2	2.98
After 1974	90.3	79.5	101.9	91.9	153.1	156.4	166.8	162.1	D
Main Space Heating Fuel									
Electricity	59.0	56.8	50.9	58.0	168.0	166.2	145.8	164.3	8.64
Natural Gas	167.3	146.2	134.2	136.0	205.1	181.2	169.0	173.1	2.90
Fuel Oil/Kerosene	184.0	157.6	134.7	137.2	224.3	193.7	173.3	175.4	2.23
LPG	Q	100.6	78.3	96.3	Q	137.7	104.6	132.7	15.04
Wood	Q	61.0	59.2	74.1	Q	132.8	119.8	138.4	8.01
Other or None	Q	52.9	38.3	50.0	Q	104.3	85.7	102.8	20.45
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	117.9	93.3	94.0	--	144.6	122.0	121.7	2.99
1,000 to 1,999	--	133.9	124.4	128.7	--	180.1	169.0	176.9	2.75
2,000 or More	--	165.3	153.3	156.1	--	227.3	209.6	215.3	3.91
Air Conditioning									
Yes	183.7	139.4	124.5	130.2	232.4	187.3	171.8	180.1	2.86
No	151.8	136.0	118.6	120.1	193.7	176.8	155.6	159.3	3.47
Main Water Heating Fuel									
Electricity	122.3	91.5	88.6	91.2	210.4	173.3	165.5	171.8	6.13
Natural Gas	171.4	149.2	133.4	140.8	206.9	184.0	167.2	176.7	2.64
Fuel Oil/Kerosene	188.0	157.8	130.0	131.3	219.1	189.1	161.8	163.0	2.71
LPG	169.4	92.0	100.1	104.1	206.9	133.3	133.0	139.0	13.01
Other or None	--	60.4	47.1	48.9	--	135.2	111.6	98.9	25.28
Ownership Status									
Own	186.8	149.1	134.3	137.1	240.2	203.4	183.1	190.0	2.76
Rent	136.8	118.3	100.4	102.1	169.6	145.7	132.0	131.0	3.51
Annual Family Income									
Under $10,000	150.5	134.7	104.8	107.1	179.4	163.4	135.2	139.8	4.24
$10,000 to $19,999	156.5	126.4	117.3	121.7	201.7	166.9	155.7	157.6	3.39
$20,000 to $29,999	179.0	140.7	121.3	116.5	232.0	195.1	165.4	163.3	3.25
$30,000 or More	210.0	161.4	143.7	146.0	282.7	225.1	201.0	203.6	4.80
Number of People in Household									
Single Person	126.7	113.5	96.5	98.9	152.1	139.1	123.1	127.0	4.73
2 to 4 People	166.2	140.1	127.3	129.0	212.2	185.6	171.9	175.0	2.74
5 or More People	219.4	161.3	143.0	153.9	286.0	227.5	204.9	221.9	4.19
Age of Household Head									
Less than 25 Years	131.2	113.5	87.5	88.2	165.2	143.2	117.5	119.4	6.63
25 to 59 Years	175.3	136.0	124.2	127.6	225.1	186.0	172.2	176.7	2.84
60 Years or Older	153.9	146.5	122.5	126.5	190.3	179.4	156.2	165.0	3.04

See footnotes at end of table.

Table 15. Average Residential Consumption for Major Fuels, 1978 Through 1984 (Continued)

North Central

Household Characteristics	Million Btu per Household				Adjusted Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.45	0.94	1.11	0.99	1.26	0.72	0.89	0.83	
All Households	179.6	138.7	121.9	129.4	237.4	195.6	175.8	179.8	2.43
Census Division									
East North Central	--	140.7	121.0	129.8	--	195.3	172.6	177.8	3.04
West North Central	--	134.0	124.0	128.6	--	196.3	183.5	184.6	3.55
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	199.3	128.0	115.3	112.9	250.1	185.8	168.1	160.3	6.48
5,500 to 7,000 HDD	182.0	146.9	126.7	138.6	239.2	199.7	179.0	187.6	2.82
4,000 to 5,499 HDD	169.4	129.4	117.5	125.5	230.6	196.5	177.3	183.3	5.11
Year of Construction									
Before 1950	185.8	150.7	134.2	145.3	234.5	197.8	176.9	190.5	2.40
1950 to 1974	172.1	136.9	116.3	120.4	235.8	197.0	173.8	171.3	3.01
After 1974	182.3	97.7	99.9	108.2	273.1	180.4	178.7	171.0	D
Main Space Heating Fuel									
Electricity	109.0	66.5	73.4	70.8	281.2	190.9	203.2	204.2	7.23
Natural Gas	184.6	155.9	133.1	141.6	230.9	200.8	174.5	183.4	2.15
Fuel Oil/Kerosene	196.4	132.1	128.3	123.6	266.3	201.9	191.3	176.9	5.81
LPG	163.2	138.6	121.1	119.0	294.3	195.3	180.4	177.4	7.18
Wood	Q	62.9	55.8	61.4	Q	132.7	123.5	123.8	10.57
Other or None	Q	41.9	Q	Q	Q	116.1	Q	Q	56.39
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	100.6	89.4	97.2	--	138.1	126.4	132.2	3.49
1,000 to 1,999	--	142.6	121.9	136.0	--	200.5	179.1	189.4	2.82
2,000 or More	--	171.0	156.9	162.4	--	245.5	225.0	229.1	2.91
Air Conditioning									
Yes	185.1	141.2	123.1	133.3	247.3	204.3	185.9	188.8	2.83
No	171.4	135.3	120.3	123.7	222.7	183.4	162.1	166.5	3.91
Main Water Heating Fuel									
Electricity	162.5	98.3	94.0	101.9	267.5	191.1	183.2	184.2	5.19
Natural Gas	185.2	155.2	133.4	141.0	230.5	199.4	174.2	181.5	2.21
Fuel Oil/Kerosene	Q	140.9	Q	Q	Q	177.5	Q	Q	9.30
LPG	155.8	121.4	119.2	102.9	210.4	176.3	176.3	147.5	8.31
Other or None	Q	75.9	Q	67.7	67.4	112.9	Q	125.4	30.19
Ownership Status									
Own	191.0	150.9	131.9	139.5	256.6	215.6	192.2	198.4	2.49
Rent	145.8	112.2	101.3	109.8	180.2	151.9	142.2	143.5	4.09
Annual Family Income									
Under $10,000	151.9	125.4	109.3	123.7	190.6	165.6	145.8	159.3	3.94
$10,000 to $19,999	169.6	124.8	111.5	113.6	225.9	179.9	163.7	156.0	3.25
$20,000 to $29,999	202.8	152.1	124.6	127.9	270.5	216.2	187.2	182.0	3.61
$30,000 or More	229.7	170.6	147.0	153.3	318.5	249.8	216.2	225.3	2.88
Number of People in Household									
Single Person	130.4	106.8	97.2	109.2	158.8	141.4	128.2	136.7	3.99
2 to 4 People	181.5	138.6	124.5	132.2	240.1	195.3	181.5	189.5	2.71
5 or More People	218.5	174.5	149.0	166.3	301.1	256.2	225.0	237.2	3.35
Age of Household Head									
Less than 25 Years	149.4	99.6	92.3	99.3	188.2	139.1	133.5	134.8	5.93
25 to 59 Years	192.7	148.0	125.7	134.3	259.5	212.0	185.0	191.8	2.63
60 Years or Older	161.7	130.3	121.4	126.6	206.8	176.5	167.0	166.6	3.05

See footnotes at end of table.

Table 15. Average Residential Consumption for Major Fuels, 1978 Through 1984 (Continued)

South

Household Characteristics	Million Btu per Household				Adjusted Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.45	0.94	1.11	0.99	1.26	0.72	0.89	0.83	
All Households	98.9	96.0	87.8	85.1	180.6	174.5	162.6	157.7	3.37
Census Division									
South Atlantic	--	91.6	80.0	79.9	--	165.6	149.0	147.4	5.30
East South Central	--	91.7	83.3	82.5	--	185.1	171.9	170.3	4.90
West South Central	--	106.8	103.8	95.8	--	183.4	178.7	166.7	5.56
Weather Zone									
Fewer than 2,000 CDD and--									
5,500 to 7,000 HDD	Q	--	--	--	Q	--	--	--	Q
4,000 to 5,499 HDD	132.2	107.2	94.4	101.5	205.1	175.6	163.1	166.5	8.72
Fewer than 4,000 HDD	97.7	98.7	89.0	87.8	190.0	177.4	163.2	161.2	3.98
More than 2,000 CDD and Fewer than 4,000 HDD	91.1	87.5	83.1	74.1	167.0	171.2	161.8	150.0	6.25
Year of Construction									
Before 1950	109.1	103.4	89.0	94.0	170.6	161.4	143.5	148.7	4.66
1950 to 1974	96.1	99.4	90.8	85.9	183.9	180.8	168.7	160.7	3.74
After 1974	84.1	74.1	76.0	70.1	189.8	175.5	173.6	161.8	D
Main Space Heating Fuel									
Electricity	66.9	61.9	61.4	53.1	191.6	175.9	173.5	153.9	5.30
Natural Gas	122.6	122.4	112.2	115.4	184.2	186.6	174.2	176.1	3.48
Fuel Oil/Kerosene	118.8	123.5	98.2	90.4	196.7	188.8	160.3	151.5	4.92
LPG	90.5	87.4	71.3	72.0	156.0	144.9	127.3	127.7	5.39
Wood	52.1	45.5	47.7	54.6	116.5	115.3	118.9	122.1	6.34
Other or None	29.6	32.6	Q	Q	69.0	92.7	Q	Q	13.81
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	72.0	65.9	62.4	--	126.2	121.7	113.1	3.78
1,000 to 1,999	--	100.0	90.1	89.6	--	183.6	169.4	170.9	3.10
2,000 or More	--	136.6	135.5	128.9	--	253.3	243.5	228.8	4.19
Air Conditioning									
Yes	102.7	99.8	93.4	87.2	194.7	188.3	177.2	168.0	3.42
No	87.7	85.3	70.4	78.1	139.1	135.0	117.0	122.9	5.10
Main Water Heating Fuel									
Electricity	86.7	72.7	67.2	64.5	191.5	170.9	160.4	154.0	3.95
Natural Gas	115.7	121.9	112.0	114.4	172.6	184.0	172.9	170.5	4.05
Fuel Oil/Kerosene	182.5	137.3	130.0	129.4	257.8	188.3	186.2	178.5	12.24
LPG	90.4	98.0	74.4	82.3	147.9	150.9	118.4	125.4	7.78
Other or None	48.7	50.6	38.4	31.1	89.5	77.6	79.4	68.5	22.85
Ownership Status									
Own	108.9	104.7	94.4	93.4	199.4	192.7	177.0	175.7	3.37
Rent	75.5	76.3	75.1	70.3	136.5	133.4	134.8	125.3	4.49
Annual Family Income									
Under $10,000	84.3	80.8	71.8	71.8	139.5	137.1	123.5	122.8	4.35
$10,000 to $19,999	96.2	91.7	81.2	80.1	180.6	166.2	151.4	144.4	3.83
$20,000 to $29,999	113.4	105.0	94.6	82.5	220.2	197.5	174.8	162.4	4.31
$30,000 or More	141.4	122.8	110.8	104.6	271.9	235.5	217.0	202.3	3.54
Number of People in Household									
Single Person	72.7	71.4	67.2	67.3	120.6	121.7	116.5	111.3	4.92
2 to 4 People	100.0	98.5	90.1	86.6	185.2	180.6	169.5	165.1	3.46
5 or More People	126.5	121.8	113.3	108.4	232.0	224.2	209.3	197.4	4.68
Age of Household Head									
Less than 25 Years	71.1	72.5	63.7	65.3	127.4	128.4	113.4	123.0	5.69
25 to 59 Years	103.4	101.3	92.6	88.4	194.1	188.0	175.3	166.9	3.29
60 Years or Older	97.6	91.9	83.0	83.1	165.1	158.9	145.9	146.3	4.68

See footnotes at end of table.

Table 15. Average Residential Consumption for Major Fuels, 1978 Through 1984 (Continued)

West

Household Characteristics	Million Btu per Household				Adjusted Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.45	0.94	1.11	0.99	1.26	0.72	0.89	0.83	
All Households	109.8	86.3	83.7	85.0	178.0	138.1	134.7	139.6	2.86
Census Division									
Mountain	--	105.2	98.2	103.4	--	158.7	154.6	157.1	3.43
Pacific	--	79.8	78.6	78.4	--	130.9	127.6	133.2	3.47
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	Q	130.6	126.8	125.3	Q	179.0	172.9	177.8	5.76
5,500 to 7,000 HDD	124.6	109.8	102.7	113.0	197.0	174.3	172.3	188.0	7.02
4,000 to 5,499 HDD	104.6	86.2	75.3	82.8	242.9	173.5	154.3	161.0	6.75
Fewer than 4,000 HDD	100.5	79.2	81.1	76.3	137.3	115.8	118.3	118.1	3.97
More than 2,000 CDD and Fewer than 4,000 HDD	Q	55.3	54.5	57.8	Q	122.0	119.3	120.4	6.80
Year of Construction									
Before 1950	112.8	86.0	85.4	88.4	167.5	126.9	127.5	131.3	4.90
1950 to 1974	107.9	87.2	88.6	89.5	178.6	140.2	138.6	143.6	3.83
After 1974	108.3	84.2	71.1	72.7	229.4	148.6	134.1	140.6	D
Main Space Heating Fuel									
Electricity	95.1	53.1	59.2	53.7	270.0	145.9	154.0	148.8	5.76
Natural Gas	114.2	97.1	94.2	98.6	151.0	137.0	131.5	140.6	3.22
Fuel Oil/Kerosene	140.5	110.8	98.6	121.2	209.1	188.7	169.5	190.2	4.86
LPG	131.8	94.5	88.5	76.9	201.2	139.7	134.1	120.8	10.47
Wood	56.5	59.3	56.7	57.7	142.5	126.5	124.5	123.4	8.36
Other or None	59.4	38.3	35.9	34.0	89.0	74.8	70.1	64.0	12.46
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	62.3	61.6	60.4	--	101.7	100.0	98.8	3.94
1,000 to 1,999	--	93.2	89.7	90.1	--	149.1	144.6	149.8	2.52
2,000 or More	--	123.6	127.6	141.3	--	193.4	201.8	226.2	4.82
Air Conditioning									
Yes	128.5	84.5	85.9	85.5	199.1	139.0	145.3	146.6	5.13
No	101.6	87.4	82.6	84.7	168.8	137.6	129.0	135.1	3.80
Main Water Heating Fuel									
Electricity	107.6	66.5	63.2	68.4	244.7	160.6	154.7	162.2	4.19
Natural Gas	111.4	94.6	92.9	93.8	146.0	132.7	129.5	134.1	3.49
Fuel Oil/Kerosene	--	94.3	74.2	Q	--	138.1	110.5	Q	33.35
LPG	Q	73.7	68.5	62.5	Q	114.5	105.8	96.3	7.59
Other or None	Q	28.7	44.0	51.9	Q	76.2	109.2	109.4	23.49
Ownership Status									
Own	127.4	98.4	94.4	98.6	214.8	157.7	154.1	162.9	2.98
Rent	85.8	65.6	67.9	65.4	127.8	104.2	105.8	105.8	4.31
Annual Family Income									
Under $10,000	95.5	74.7	72.2	73.9	147.8	115.9	116.1	120.6	4.73
$10,000 to $19,999	105.9	81.1	78.4	75.3	174.1	131.0	121.1	120.8	3.99
$20,000 to $29,999	118.3	94.2	83.0	78.5	194.9	153.8	138.3	131.5	3.61
$30,000 or More	140.0	101.0	100.0	103.1	233.6	161.4	161.3	170.4	4.70
Number of People in Household									
Single Person	78.1	60.4	61.8	57.9	118.8	96.0	95.3	98.9	4.30
2 to 4 People	116.4	90.1	86.8	87.4	190.3	144.3	141.1	143.0	2.81
5 or More People	149.3	111.2	113.3	119.8	252.5	178.0	182.6	191.9	5.95

See footnotes at end of table.

Table 15. Average Residential Consumption for Major Fuels, 1978 Through 1984 (Continued)

West

Household Characteristics	Million Btu per Household				Adjusted Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.45	0.94	1.11	0.99	1.26	0.72	0.89	0.83	
Age of Household Head									
Less than 25 Years	81.9	69.9	64.7	75.5	123.2	120.6	105.8	125.0	6.56
25 to 59 Years	118.2	89.6	88.3	89.5	192.8	142.9	142.2	145.5	3.00
60 Years or Older	101.5	82.7	78.6	76.8	165.4	130.5	125.5	129.2	4.34

-- Data not applicable or not available
[D] The RSEs calculated using the row and column factors are unreliable. Reliable RSE estimates for each cell are found in Appendix A.
[Q] Data withheld due to large variance (1.96 * standard error > value).
Note: Million Btu per Household includes site electricity, natural gas, fuel oil/kerosene, and LPG.
Adjusted Million Btu per Household includes adjusted electricity, natural gas, fuel oil/kerosene, and LPG.
To obtain a Relative Standard Error Percent (RSE) for any table cell, multiply the cell's corresponding column and row factors.
See Glossary for definition of terms used in this report.
Data may not sum to totals because of rounding.
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

Table 16. Average Residential Expenditures for All Major Fuels, 1978 Through 1984

United States

Household Characteristics	Dollars per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor	1.32	0.87	0.95	0.91	
All Households	$724	$916	$1,048	$1,123	1.56
Weather Zone					
Fewer than 2,000 CDD and--					
More than 7,000 HDD	778	951	1,038	1,067	4.39
5,500 to 7,000 HDD	781	987	1,138	1,283	2.56
4,000 to 5,499 HDD	815	1,052	1,165	1,212	3.70
Fewer than 4,000 HDD	584	707	829	905	2.93
More than 2,000 CDD and Fewer than 4,000 HDD	632	860	1,037	1,081	4.65
Year of Construction					
Before 1950	738	961	1,070	1,186	1.93
1950 to 1974	717	904	1,049	1,106	1.93
After 1974	694	840	991	1,035	D
Main Space Heating Fuel					
Electricity	662	797	976	1,026	3.68
Natural Gas	664	815	1,011	1,119	1.49
Fuel Oil/Kerosene	959	1,458	1,433	1,422	2.30
LPG	765	1,041	1,072	1,170	3.99
Wood	437	663	775	866	4.38
Other or None	323	645	693	725	7.69
Measured Heated Area of Residence (square feet)					
Less than 1,000	--	707	792	819	1.85
1,000 to 1,999	--	924	1,068	1,167	1.75
2,000 or More	--	1,214	1,439	1,572	1.97
Air Conditioning					
Yes	793	969	1,137	1,194	1.72
No	637	846	924	1,019	2.26
Main Water Heating Fuel					
Electricity	751	893	1,013	1,092	2.74
Natural Gas	669	824	1,022	1,119	1.57
Fuel Oil/Kerosene	1,011	1,555	1,472	1,437	2.72
LPG	791	1,024	1,067	1,105	4.56
Other or None	332	622	718	711	12.73
Ownership Status					
Own	805	1,004	1,151	1,265	1.61
Rent	564	742	861	870	2.01
Annual Family Income					
Under $10,000	581	783	864	938	2.11
$10,000 to $19,999	708	866	982	997	1.93
$20,000 to $29,999	827	985	1,074	1,115	1.89
$30,000 or More	996	1,147	1,306	1,398	2.40
Number of People in Household					
Single Person	489	686	783	821	2.44
2 to 4 People	741	932	1,083	1,170	1.59
5 or More People	959	1,171	1,350	1,465	2.58
Age of Household Head					
Less than 25 Years	558	669	746	840	3.50
25 to 59 Years	782	963	1,101	1,178	1.72
60 Years or Older	644	877	1,004	1,075	1.95

See footnotes at end of table.

Table 16. Average Residential Expenditures for All Major Fuels, 1978 Through 1984 (Continued)

Northeast

Household Characteristics	Dollars per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	1.32	0.87	0.95	0.91	
All Households	$887	$1,268	$1,369	$1,443	2.49
Census Division					
New England	--	1,311	1,395	1,471	3.26
Middle Atlantic	--	1,254	1,361	1,435	2.89
Weather Zone					
Fewer than 2,000 CDD and--					
More than 7,000 HDD	Q	1,179	1,115	1,264	7.27
5,500 to 7,000 HDD	911	1,172	1,298	1,446	4.42
4,000 to 5,499 HDD	919	1,379	1,488	1,481	2.95
Year of Construction					
Before 1950	894	1,279	1,359	1,459	2.63
1950 to 1974	925	1,306	1,388	1,450	3.12
After 1974	609	999	1,344	1,327	D
Main Space Heating Fuel					
Electricity	602	991	1,112	1,387	10.43
Natural Gas	795	1,026	1,331	1,421	4.16
Fuel Oil/Kerosene	1,008	1,580	1,549	1,535	2.36
LPG	Q	1,137	961	1,298	15.42
Wood	Q	828	941	1,139	9.09
Other or None	Q	738	720	941	19.48
Measured Heated Area of Residence (square feet)					
Less than 1,000	--	1,100	1,084	1,036	2.76
1,000 to 1,999	--	1,213	1,386	1,494	2.93
2,000 or More	--	1,532	1,702	1,839	3.71
Air Conditioning					
Yes	996	1,338	1,463	1,558	3.22
No	797	1,199	1,267	1,325	2.75
Main Water Heating Fuel					
Electricity	830	1,135	1,315	1,414	6.34
Natural Gas	830	1,091	1,343	1,479	3.86
Fuel Oil/Kerosene	998	1,580	1,486	1,445	2.69
LPG	1,038	1,059	1,177	1,298	10.40
Other or None	--	949	890	833	24.03
Ownership Status					
Own	1,009	1,379	1,504	1,617	2.54
Rent	712	1,080	1,142	1,106	3.09
Annual Family Income					
Under $10,000	743	1,184	1,128	1,146	3.15
$10,000 to $19,999	856	1,168	1,308	1,297	2.83
$20,000 to $29,999	981	1,299	1,366	1,396	3.34
$30,000 or More	1,177	1,565	1,682	1,782	4.50
Number of People in Household					
Single Person	629	1,020	1,030	1,040	4.29
2 to 4 People	890	1,275	1,429	1,489	2.70
5 or More People	1,219	1,594	1,733	1,948	4.04
Age of Household Head					
Less than 25 Years	683	984	983	1,014	7.08
25 to 59 Years	950	1,284	1,432	1,514	2.95
60 Years or Older	789	1,282	1,313	1,378	3.08

See footnotes at end of table.

Table 16. Average Residential Expenditures for All Major Fuels, 1978 Through 1984 (Continued)

North Central

Household Characteristics	Dollars per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	1.32	0.87	0.95	0.91	
All Households	$821	$910	$1,060	$1,160	2.42
Census Division					
East North Central	--	921	1,056	1,170	3.12
West North Central	--	883	1,068	1,134	3.03
Weather Zone					
Fewer than 2,000 CDD and--					
More than 7,000 HDD	890	944	1,056	1,050	5.36
5,500 to 7,000 HDD	838	904	1,065	1,213	3.12
4,000 to 5,499 HDD	773	881	1,049	1,153	2.95
Year of Construction					
Before 1950	817	919	1,071	1,229	2.97
1950 to 1974	808	910	1,056	1,125	2.72
After 1974	937	872	1,034	1,058	D
Main Space Heating Fuel					
Electricity	975	854	1,090	1,180	7.40
Natural Gas	751	861	1,024	1,154	2.13
Fuel Oil/Kerosene	1,082	1,309	1,404	1,298	6.06
LPG	1,033	1,278	1,350	1,417	7.18
Wood	Q	752	803	883	10.74
Other or None	Q	642	Q	Q	53.75
***Measured Heated Area of Residence* (square feet)**					
Less than 1,000	--	661	765	862	3.37
1,000 to 1,999	--	931	1,087	1,219	2.24
2,000 or More	--	1,126	1,342	1,468	2.90
Air Conditioning					
Yes	839	915	1,104	1,194	2.53
No	794	902	999	1,109	3.63
Main Water Heating Fuel					
Electricity	1,016	985	1,110	1,205	5.04
Natural Gas	758	859	1,031	1,146	2.26
Fuel Oil/Kerosene	Q	1,259	Q	Q	7.18
LPG	943	1,146	1,295	1,188	7.92
Other or None	319	752	Q	882	20.82
Ownership Status					
Own	886	998	1,159	1,280	2.11
Rent	625	718	855	925	4.16
Annual Family Income					
Under $10,000	661	778	893	1,042	3.69
$10,000 to $19,999	791	845	992	1,019	3.22
$20,000 to $29,999	921	983	1,129	1,168	3.35
$30,000 or More	1,093	1,163	1,279	1,427	3.06
Number of People in Household					
Single Person	560	671	784	878	3.90
2 to 4 People	830	908	1,087	1,228	2.58
5 or More People	1,028	1,180	1,369	1,507	3.08
Age of Household Head					
Less than 25 Years	657	654	806	873	6.60
25 to 59 Years	900	982	1,109	1,232	2.56
60 Years or Older	706	829	1,018	1,083	3.02

See footnotes at end of table.

Table 16. Average Residential Expenditures for All Major Fuels, 1978 Through 1984 (Continued)

South

Household Characteristics	Dollars per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	1.32	0.87	0.95	0.91	
All Households	$674	$876	$1,019	$1,055	3.12
Census Division					
South Atlantic	--	942	1,007	1,074	4.43
East South Central	--	778	908	930	4.54
West South Central	--	823	1,112	1,105	5.86
Weather Zone					
Fewer than 2,000 CDD and--					
5,500 to 7,000 HDD	Q	--	--	--	Q
4,000 to 5,499 HDD	864	966	1,071	1,099	10.34
Fewer than 4,000 HDD	690	838	949	990	3.31
More than 2,000 CDD and Fewer than 4,000 HDD	632	863	1,054	1,088	4.93
Year of Construction					
Before 1950	613	845	935	1,017	4.26
1950 to 1974	699	886	1,047	1,068	3.40
After 1974	695	895	1,062	1,069	D
Main Space Heating Fuel					
Electricity	699	861	1,039	1,031	4.71
Natural Gas	642	827	1,054	1,121	3.47
Fuel Oil/Kerosene	820	1,303	1,190	1,155	5.04
LPG	657	921	973	1,050	4.73
Wood	454	570	739	815	5.10
Other or None	316	456	Q	Q	12.05
Measured Heated Area of Residence (square feet)					
Less than 1,000	--	668	795	792	3.43
1,000 to 1,999	--	912	1,046	1,129	3.42
2,000 or More	--	1,228	1,494	1,488	3.44
Air Conditioning					
Yes	727	929	1,096	1,115	2.98
No	518	725	775	850	4.91
Main Water Heating Fuel					
Electricity	725	882	985	1,033	3.60
Natural Gas	609	832	1,060	1,098	3.91
Fuel Oil/Kerosene	1,083	1,444	1,501	1,457	10.96
LPG	649	1,007	961	1,067	7.62
Other or None	349	464	636	567	20.47
Ownership Status					
Own	738	955	1,096	1,171	3.20
Rent	524	699	870	846	3.85
Annual Family Income					
Under $10,000	516	718	809	836	3.97
$10,000 to $19,999	676	837	955	981	3.32
$20,000 to $29,999	828	952	1,051	1,059	3.38
$30,000 or More	1,008	1,166	1,347	1,339	3.16
Number of People in Household					
Single Person	458	647	772	767	4.50
2 to 4 People	693	904	1,055	1,099	2.96
5 or More People	841	1,087	1,272	1,312	4.34
Age of Household Head					
Less than 25 Years	517	655	719	819	5.13
25 to 59 Years	716	936	1,086	1,107	3.13
60 Years or Older	620	815	940	1,000	3.96

See footnotes at end of table.

Detailed Statistics

Table 16. Average Residential Expenditures for All Major Fuels, 1978 Through 1984 (Continued)

West

Household Characteristics	Dollars per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	1.32	0.87	0.95	0.91	
All Households	$469	$603	$731	$852	2.88
Census Division					
Mountain	--	704	880	944	2.77
Pacific	--	568	678	819	3.79
Weather Zone					
Fewer than 2,000 CDD and--					
More than 7,000 HDD	Q	706	876	907	6.12
5,500 to 7,000 HDD	508	645	847	997	5.95
4,000 to 5,499 HDD	504	578	648	815	8.27
Fewer than 4,000 HDD	428	562	694	808	4.23
More than 2,000 CDD and Fewer than 4,000 HDD	Q	829	895	1,008	5.79
Year of Construction					
Before 1950	450	545	683	778	5.48
1950 to 1974	481	618	756	893	4.09
After 1974	470	647	731	853	D
Main Space Heating Fuel					
Electricity	484	474	707	805	6.60
Natural Gas	453	613	725	873	3.31
Fuel Oil/Kerosene	662	892	926	1,124	6.50
LPG	719	872	1,022	971	10.25
Wood	297	543	660	708	12.77
Other or None	261	739	764	690	11.56
Measured Heated Area of Residence (square feet)					
Less than 1,000	--	453	559	623	3.78
1,000 to 1,999	--	649	771	898	2.99
2,000 or More	--	829	1,091	1,377	5.11
Air Conditioning					
Yes	571	661	827	953	4.15
No	425	571	680	788	3.54
Main Water Heating Fuel					
Electricity	520	564	712	884	4.42
Natural Gas	443	602	722	839	3.55
Fuel Oil/Kerosene	--	1,006	1,157	Q	26.93
LPG	Q	815	946	884	6.35
Other or None	Q	639	803	788	18.37
Ownership Status					
Own	534	693	838	1,000	3.13
Rent	380	449	572	639	4.44
Annual Family Income					
Under $10,000	404	490	631	746	4.32
$10,000 to $19,999	447	568	657	724	3.89
$20,000 to $29,999	499	668	738	790	3.59
$30,000 or More	631	736	887	1,054	4.91
Number of People in Household					
Single Person	337	416	526	597	4.83
2 to 4 People	499	631	763	871	3.03
5 or More People	621	781	990	1,193	6.39

See footnotes at end of table.

Table 16. Average Residential Expenditures for All Major Fuels, 1978 Through 1984 (Continued)

West

Household Characteristics	Dollars per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	1.32	0.87	0.95	0.91	
Age of Household Head					
Less than 25 Years	372	494	541	722	6.66
25 to 59 Years	504	628	770	892	3.17
60 Years or Older	429	571	696	794	3.39

-- Data not applicable or not available.
[D] The RSEs calculated using the row and column factors are unreliable. Reliable RSE estimates for each cell are found in Appendix A.
[Q] Data withheld due to large variance (1.96 * standard error > value).
Note: To obtain a Relative Standard Error Percent (RSE) for any table cell, multiply the cell's corresponding column and row factors.
See Glossary for definition of terms used in this report.
Data may not sum to totals because of rounding.
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

Detailed Statistics

Table 17. Counts of U.S. Households Using Any Major Fuel, 1978 Through 1984

United States

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.33	0.87	0.98	0.89	1.33	0.87	0.98	0.89	
All Households	76.6	81.6	83.8	86.3	100.0%	100.0%	100.0%	100.0%	0.00
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	6.3	8.5	8.5	9.0	8.2	10.4	10.2	10.4	19.98
5,500 to 7,000 HDD	21.6	20.9	21.0	21.5	28.2	25.7	25.1	24.9	7.72
4,000 to 5,499 HDD	20.3	21.1	22.1	22.5	26.5	25.9	26.4	26.1	9.24
Fewer than 4,000 HDD	16.8	19.0	19.6	20.0	21.9	23.3	23.3	23.1	8.47
More than 2,000 CDD and Fewer than 4,000 HDD	11.6	12.1	12.6	13.3	15.1	14.8	15.0	15.4	8.22
Year of Construction									
Before 1950	32.7	30.8	30.6	32.2	42.7	37.7	36.6	37.3	3.44
1950 to 1974	38.7	39.5	40.2	39.0	50.5	48.4	48.0	45.2	3.10
After 1974	5.2	11.3	12.9	15.2	6.8	13.9	15.4	17.6	D
Main Space Heating Fuel									
Electricity	12.1	14.3	13.4	14.5	15.8	17.5	16.0	16.8	7.73
Natural Gas	41.8	44.6	47.5	47.8	54.6	54.6	56.7	55.4	3.42
Fuel Oil/Kerosene	16.9	13.4	12.0	12.2	22.1	16.4	14.4	14.1	5.69
LPG	3.1	3.7	3.8	3.9	4.1	4.5	4.5	4.5	11.97
Wood	1.9	4.7	5.6	6.5	2.5	5.8	6.7	7.5	13.14
Other or None	.8	1.0	1.5	1.4	1.0	1.2	1.7	1.6	24.93
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	28.5	30.3	31.8	--	35.0	36.2	36.9	3.17
1,000 to 1,999	--	34.0	35.6	36.4	--	41.6	42.5	42.2	2.45
2,000 or More	--	19.1	17.9	18.1	--	23.4	21.3	20.9	4.02
Air Conditioning									
Yes	42.8	46.7	48.7	51.5	55.8	57.2	58.1	59.6	2.71
No	33.8	34.9	35.1	34.9	44.2	42.8	41.9	40.4	3.69
Main Water Heating Fuel									
Electricity	25.0	26.1	26.6	28.9	32.7	31.9	31.8	33.5	4.89
Natural Gas	42.1	44.1	47.1	46.9	55.0	54.1	56.2	54.3	3.31
Fuel Oil/Kerosene	5.8	7.1	5.7	5.4	7.5	8.7	6.7	6.3	7.99
LPG	3.1	3.6	3.5	3.8	4.0	4.4	4.1	4.5	12.26
Other or None	.6	.8	1.0	1.3	.7	1.0	1.2	1.5	17.90
Ownership Status									
Own	51.0	54.3	53.9	55.3	66.6	66.5	64.4	64.1	1.91
Rent	25.6	27.3	29.8	31.0	33.4	33.5	35.6	35.9	3.61
Annual Family Income									
Under $10,000	25.7	24.2	23.1	21.9	33.5	29.7	27.6	25.3	3.65
$10,000 to $19,999	26.2	25.7	22.2	22.1	34.3	31.5	26.5	25.6	2.87
$20,000 to $29,999	15.6	17.3	18.2	16.9	20.4	21.2	21.7	19.5	3.90
$30,000 or More	9.1	14.4	20.2	25.5	11.9	17.7	24.2	29.5	4.80
Number of People in Household									
Single Person	14.4	15.7	19.3	20.4	18.8	19.3	23.0	23.6	3.63
2 to 4 People	51.6	55.0	54.1	55.6	67.4	67.4	64.6	64.4	1.19
5 or More People	10.6	10.9	10.4	10.4	13.8	13.3	12.5	12.1	4.65
Age of Household Head									
Less than 25 Years	6.8	6.6	6.0	6.1	8.9	8.1	7.1	7.1	7.14
25 to 59 Years	48.7	53.2	53.4	54.6	63.6	65.2	63.7	63.3	1.55
60 Years or Older	21.1	21.8	24.4	25.6	27.6	26.7	29.1	29.6	3.64

See footnotes at end of table.

Table 17. Counts of U.S. Households Using Any Major Fuel, 1978 Through 1984 (Continued)

Northeast

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.33	0.87	0.98	0.89	1.33	0.87	0.98	0.89	
All Households	17.4	17.7	18.0	18.3	100.0%	100.0%	100.0%	100.0%	0.00
Census Division									
New England	--	4.3	4.2	4.3	--	24.2	23.5	23.3	7.95
Middle Atlantic	--	13.4	13.7	14.0	--	75.8	76.5	76.7	2.46
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	Q	Q	Q	1.9	Q	Q	Q	10.1	55.36
5,500 to 7,000 HDD	6.1	7.8	8.0	8.1	35.3	44.4	44.7	44.1	14.96
4,000 to 5,499 HDD	8.4	8.1	8.3	8.4	48.5	45.8	46.3	45.8	10.31
Year of Construction									
Before 1950	10.0	9.6	9.4	10.1	57.5	54.5	52.1	55.4	6.01
1950 to 1974	6.3	6.7	7.1	6.4	36.2	37.7	39.5	35.2	8.39
After 1974	Q	1.4	1.5	1.7	Q	7.8	8.4	9.4	D
Main Space Heating Fuel									
Electricity	1.4	1.6	1.3	1.4	8.3	8.9	7.3	7.5	25.44
Natural Gas	7.0	6.6	7.5	7.2	40.1	37.5	42.0	39.2	11.01
Fuel Oil/Kerosene	8.8	8.2	7.6	8.2	50.8	46.4	42.1	44.7	6.36
LPG	.1	Q	Q	.2	.5	Q	Q	.9	47.03
Wood	Q	1.0	1.0	1.1	Q	5.4	5.6	6.0	45.16
Other or None	Q	.1	.3	.3	Q	.8	1.9	1.6	40.31
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	5.9	6.0	6.1	--	33.3	33.5	33.3	5.57
1,000 to 1,999	--	6.6	7.1	6.8	--	37.6	39.8	37.2	6.26
2,000 or More	--	5.1	4.8	5.4	--	29.0	26.7	29.5	7.45
Air Conditioning									
Yes	7.9	8.7	9.4	9.3	45.4	49.2	52.1	50.8	6.80
No	9.5	9.0	8.6	9.0	54.6	50.8	47.9	49.2	6.64
Main Water Heating Fuel									
Electricity	3.6	3.9	3.7	4.0	20.4	21.8	20.5	21.9	14.29
Natural Gas	8.1	7.2	8.7	8.5	46.5	40.8	48.3	46.2	9.55
Fuel Oil/Kerosene	5.2	6.1	5.0	5.1	29.8	34.5	28.1	27.9	7.72
LPG	.6	.3	.4	.5	3.2	1.9	2.1	2.9	33.65
Other or None	--	.2	.2	.2	--	.9	1.0	1.1	43.16
Ownership Status									
Own	10.2	11.1	11.3	12.1	59.0	62.9	62.8	66.0	3.34
Rent	7.1	6.6	6.7	6.2	41.0	37.1	37.2	34.0	5.62
Annual Family Income									
Under $10,000	5.7	4.7	4.7	4.1	33.1	26.9	26.2	22.6	6.32
$10,000 to $19,999	5.6	6.0	4.6	4.1	32.4	33.8	25.9	22.6	5.98
$20,000 to $29,999	3.8	4.0	4.0	4.0	21.7	22.8	22.3	22.0	8.35
$30,000 or More	2.2	2.9	4.6	6.0	12.8	16.5	25.6	32.8	8.15
Number of People in Household									
Single Person	3.4	3.5	4.4	4.1	19.7	20.1	24.7	22.7	7.16
2 to 4 People	11.4	11.7	11.2	11.9	65.5	66.3	62.6	65.0	2.38
5 or More People	2.6	2.4	2.3	2.3	14.8	13.7	12.7	12.3	8.53
Age of Household Head									
Less than 25 Years	1.4	.9	1.0	.9	7.8	5.2	5.3	5.1	14.99
25 to 59 Years	11.4	12.0	11.1	11.3	65.9	68.0	62.0	61.9	3.30
60 Years or Older	4.6	4.7	5.9	6.0	26.3	26.8	32.7	33.0	7.21

See footnotes at end of table.

Table 17. Counts of U.S. Households Using Any Major Fuel, 1978 Through 1984 (Continued)

North Central

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.33	0.87	0.98	0.89	1.33	0.87	0.98	0.89	
All Households	20.6	21.1	21.3	21.6	100.0%	100.0%	100.0%	100.0%	0.00
Census Division									
East North Central	--	14.8	15.0	15.2	--	70.3	70.4	70.3	2.85
West North Central	--	6.3	6.3	6.4	--	29.7	29.6	29.7	6.74
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	2.8	5.3	5.5	5.5	13.3	25.1	25.8	25.2	22.80
5,500 to 7,000 HDD	10.1	11.7	11.5	11.7	49.2	55.4	53.8	54.0	9.07
4,000 to 5,499 HDD	7.7	4.1	4.3	4.5	37.5	19.5	20.4	20.8	23.12
Year of Construction									
Before 1950	10.4	9.3	9.3	9.7	50.4	44.0	43.5	44.7	7.34
1950 to 1974	9.0	9.5	9.2	8.2	43.5	45.2	43.1	37.8	6.95
After 1974	1.3	2.3	2.9	3.8	6.1	10.8	13.4	17.5	D
Main Space Heating Fuel									
Electricity	1.1	2.1	2.1	1.3	5.3	10.1	9.9	6.2	24.26
Natural Gas	15.3	15.0	15.5	16.4	74.2	71.1	72.7	75.8	4.36
Fuel Oil/Kerosene	3.1	1.5	1.6	1.2	15.1	7.3	7.4	5.4	16.20
LPG	.8	1.2	1.0	1.3	3.8	5.7	4.5	5.8	15.54
Wood	Q	1.1	1.1	1.4	Q	5.4	5.2	6.3	32.72
Other or None	Q	.1	Q	Q	Q	.4	Q	Q	60.96
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	6.3	6.8	7.8	--	29.8	32.1	36.1	6.55
1,000 to 1,999	--	8.4	8.1	7.8	--	39.7	38.2	36.0	5.51
2,000 or More	--	6.4	6.3	6.0	--	30.5	29.7	28.0	5.91
Air Conditioning									
Yes	12.3	12.3	12.3	12.9	59.7	58.3	57.6	59.8	6.13
No	8.3	8.8	9.0	8.7	40.3	41.7	42.4	40.2	8.77
Main Water Heating Fuel									
Electricity	4.2	5.2	5.5	5.0	20.3	24.8	25.8	23.1	10.96
Natural Gas	15.4	14.4	14.7	15.2	74.5	68.2	68.9	70.4	4.40
Fuel Oil/Kerosene	Q	.2	Q	Q	Q	.9	Q	Q	60.25
LPG	.8	1.2	.9	1.2	4.0	5.9	4.1	5.4	21.14
Other or None	.1	.1	.1	.1	.3	.3	.6	.6	34.51
Ownership Status									
Own	15.4	14.4	14.3	14.3	74.9	68.6	67.3	66.2	3.45
Rent	5.2	6.6	7.0	7.3	25.1	31.4	32.7	33.8	7.80
Annual Family Income									
Under $10,000	6.2	6.1	5.9	6.0	30.1	28.7	27.9	27.9	7.79
$10,000 to $19,999	7.1	6.8	5.9	5.5	34.4	32.2	27.7	25.4	5.66
$20,000 to $29,999	4.6	4.7	4.5	4.7	22.4	22.5	21.3	21.9	6.78
$30,000 or More	2.7	3.5	4.9	5.4	13.1	16.6	23.1	24.9	11.06
Number of People in Household									
Single Person	3.2	3.5	4.7	6.1	15.3	16.6	22.1	28.1	7.48
2 to 4 People	14.1	14.4	13.6	13.2	68.6	68.3	63.8	61.2	2.57
5 or More People	3.3	3.2	3.0	2.3	16.1	15.1	14.1	10.7	7.91
Age of Household Head									
Less than 25 Years	1.8	1.9	1.7	1.5	8.6	9.0	7.8	7.1	13.97
25 to 59 Years	12.6	13.3	13.5	13.3	61.1	63.2	63.4	61.6	2.85
60 Years or Older	6.2	5.9	6.1	6.8	30.3	27.8	28.8	31.3	6.96

See footnotes at end of table.

Table 17. Counts of U.S. Households Using Any Major Fuel, 1978 Through 1984 (Continued)

South

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.33	0.87	0.98	0.89	1.33	0.87	0.98	0.89	
All Households	24.6	27.0	28.1	29.3	100.0%	100.0%	100.0%	100.0%	0.00
Census Division									
South Atlantic	--	14.0	13.9	14.8	--	52.1	49.6	50.4	3.59
East South Central	--	5.2	5.7	5.8	--	19.2	20.2	19.7	6.63
West South Central	--	7.7	8.5	8.8	--	28.7	30.2	29.9	4.85
Weather Zone									
Fewer than 2,000 CDD and--									
5,500 to 7,000 HDD	Q	--	--	--	Q	--	--	--	Q
4,000 to 5,499 HDD	2.1	5.9	6.4	6.4	8.5	22.0	22.8	22.0	24.06
Fewer than 4,000 HDD	10.0	10.0	10.4	10.7	40.8	37.2	37.0	36.5	14.24
More than 2,000 CDD and Fewer than 4,000 HDD	11.5	11.0	11.3	12.2	46.8	40.9	40.2	41.5	8.76
Year of Construction									
Before 1950	7.1	7.5	7.7	7.8	28.9	27.8	27.5	26.6	7.31
1950 to 1974	15.6	14.7	15.6	16.1	63.3	54.4	55.7	54.9	4.06
After 1974	1.9	4.8	4.7	5.4	7.8	17.8	16.8	18.4	D
Main Space Heating Fuel									
Electricity	6.7	7.7	6.8	8.4	27.3	28.7	24.3	28.7	11.05
Natural Gas	10.0	11.8	13.3	13.1	40.7	43.9	47.5	44.7	8.08
Fuel Oil/Kerosene	4.2	3.1	2.5	2.4	17.0	11.6	8.9	8.1	15.03
LPG	2.0	2.0	2.3	2.1	8.1	7.4	8.1	7.0	18.42
Wood	1.2	2.0	2.6	2.8	5.0	7.3	9.3	9.7	17.57
Other or None	.4	.3	Q	Q	1.8	1.1	Q	Q	56.55
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	10.0	10.6	11.0	--	36.9	37.7	37.4	6.23
1,000 to 1,999	--	12.3	13.2	14.1	--	45.7	47.2	48.1	4.26
2,000 or More	--	4.7	4.2	4.3	--	17.3	15.1	14.5	8.49
Air Conditioning									
Yes	18.3	20.0	21.3	22.6	74.5	74.0	75.8	77.2	2.78
No	6.3	7.0	6.8	6.7	25.5	26.0	24.2	22.8	8.52
Main Water Heating Fuel									
Electricity	12.7	13.2	13.2	15.4	51.6	48.9	47.1	52.5	6.27
Natural Gas	9.5	11.3	12.4	11.7	38.6	41.9	44.2	39.8	7.85
Fuel Oil/Kerosene	.4	.8	.4	.2	1.6	2.8	1.5	.7	37.37
LPG	1.5	1.3	1.5	1.5	6.2	4.9	5.4	5.1	23.43
Other or None	.5	.4	.5	.5	1.9	1.5	1.8	1.8	27.81
Ownership Status									
Own	17.2	18.7	18.5	18.8	70.1	69.3	65.9	64.2	3.28
Rent	7.4	8.3	9.6	10.5	29.9	30.7	34.1	35.8	6.78
Annual Family Income									
Under $10,000	9.0	9.0	8.4	8.4	36.7	33.5	30.1	28.5	6.86
$10,000 to $19,999	9.2	8.1	7.5	7.9	37.4	30.2	26.7	27.1	4.98
$20,000 to $29,999	4.1	5.1	5.8	4.6	16.8	18.8	20.8	15.7	7.32
$30,000 or More	2.3	4.7	6.3	8.4	9.2	17.5	22.5	28.7	8.89
Number of People in Household									
Single Person	4.0	5.3	6.1	6.1	16.4	19.5	21.8	20.7	7.53
2 to 4 People	17.4	18.4	18.6	19.9	70.8	68.2	66.4	67.8	1.94
5 or More People	3.1	3.3	3.3	3.4	12.8	12.3	11.8	11.5	8.35
Age of Household Head									
Less than 25 Years	2.3	2.5	2.0	2.2	9.5	9.4	7.2	7.6	11.77
25 to 59 Years	16.2	17.1	18.1	18.8	65.7	63.3	64.7	64.1	2.97
60 Years or Older	6.1	7.3	7.9	8.3	24.8	27.3	28.1	28.3	6.69

See footnotes at end of table.

Table 17. Counts of U.S. Households Using Any Major Fuel, 1978 Through 1984 (Continued)

West

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.33	0.87	0.98	0.89	1.33	0.87	0.98	0.89	
All Households	14.0	16.0	16.5	17.1	100.0%	100.0%	100.0%	100.0%	0.00
Census Division									
Mountain	--	4.1	4.3	4.5	--	25.7	26.2	26.4	5.67
Pacific	--	11.8	12.2	12.6	--	74.3	73.8	73.6	2.00
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	Q	1.4	1.4	1.7	Q	9.1	8.3	10.0	14.95
5,500 to 7,000 HDD	4.4	1.4	1.5	1.8	31.2	8.9	9.4	10.5	22.80
4,000 to 5,499 HDD	Q	3.0	3.0	3.2	Q	18.9	18.5	18.6	28.72
Fewer than 4,000 HDD	6.8	9.0	9.2	9.3	48.3	56.3	55.7	54.2	7.44
More than 2,000 CDD and Fewer than 4,000 HDD	Q	1.1	1.3	1.1	Q	6.8	8.1	6.7	22.74
Year of Construction									
Before 1950	5.2	4.4	4.3	4.6	37.2	27.5	26.2	26.7	7.61
1950 to 1974	7.8	8.7	8.4	8.3	55.9	54.5	50.7	48.3	5.95
After 1974	1.0	2.9	3.8	4.3	6.8	18.1	23.1	25.0	D
Main Space Heating Fuel									
Electricity	2.8	2.9	3.1	3.4	20.1	17.9	19.1	19.8	14.32
Natural Gas	9.6	11.1	11.1	11.2	68.2	69.8	67.6	65.3	5.07
Fuel Oil/Kerosene	.8	.5	.4	.5	5.6	3.1	2.6	2.7	24.94
LPG	Q	.4	.4	.4	Q	2.3	2.3	2.4	31.32
Wood	Q	.7	.9	1.1	Q	4.1	5.6	6.7	22.87
Other or None	.2	.5	.5	.5	1.4	2.8	2.9	3.1	20.82
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	6.4	6.9	7.0	--	40.2	41.7	40.8	5.67
1,000 to 1,999	--	6.6	7.1	7.7	--	41.5	43.1	45.3	4.33
2,000 or More	--	2.9	2.5	2.4	--	18.3	15.2	13.8	10.27
Air Conditioning									
Yes	4.2	5.8	5.7	6.6	30.3	36.1	34.9	38.7	11.49
No	9.8	10.2	10.7	10.5	69.7	63.9	65.1	61.3	6.17
Main Water Heating Fuel									
Electricity	4.6	3.8	4.2	4.5	32.9	23.9	25.6	26.3	11.99
Natural Gas	9.2	11.3	11.3	11.5	65.5	70.7	68.8	67.5	4.99
Fuel Oil/Kerosene	--	.0	.1	Q	--	.2	.4	Q	48.35
LPG	Q	.7	.7	.6	Q	4.2	4.1	3.7	23.90
Other or None	Q	.2	.2	.4	Q	1.0	1.1	2.4	38.54
Ownership Status									
Own	8.1	10.1	9.9	10.1	57.7	63.3	59.8	59.1	4.43
Rent	5.9	5.9	6.6	7.0	42.3	36.7	40.2	40.9	6.64
Annual Family Income									
Under $10,000	4.7	4.4	4.1	3.3	33.5	27.5	24.6	19.6	7.31
$10,000 to $19,999	4.3	4.8	4.2	4.5	30.9	30.1	25.3	26.5	5.94
$20,000 to $29,999	3.1	3.4	3.8	3.5	22.1	21.6	23.2	20.4	7.19
$30,000 or More	1.9	3.3	4.4	5.7	13.6	20.9	26.9	33.5	8.69
Number of People in Household									
Single Person	3.8	3.4	4.0	4.1	26.9	21.5	24.2	23.9	6.99
2 to 4 People	8.7	10.5	10.6	10.6	62.0	66.1	64.5	61.7	2.53
5 or More People	1.6	2.0	1.9	2.5	11.1	12.4	11.3	14.4	11.91

See footnotes at end of table.

Table 17. Counts of U.S. Households Using Any Major Fuel, 1978 Through 1984 (Continued)

West

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.33	0.87	0.98	0.89	1.33	0.87	0.98	0.89	
Age of Household Head									
Less than 25 Years	1.3	1.3	1.3	1.4	9.5	8.2	8.1	8.2	14.74
25 to 59 Years	8.5	10.8	10.6	11.2	60.6	67.7	64.5	65.7	3.38
60 Years or Older	4.2	3.9	4.5	4.5	29.9	24.2	27.4	26.2	7.37

-- Data not applicable or not available.
[D] The RSEs calculated using the row and column factors are unreliable. Reliable RSE estimates for each cell are found in Appendix A.
[Q] Data withheld due to large variance (1.96 * standard error > value).
Note: To obtain a Relative Standard Error Percent (RSE) for any table cell, multiply the cell's corresponding column and row factors.
See Glossary for definition of terms used in this report.
Data may not sum to totals because of rounding.
Percentages are calculated on unrounded numbers.
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

Table 18. Average Residential Consumption for Site Electricity, 1978 Through 1984

United States

Household Characteristics	Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	1.41	0.86	0.95	0.87	
All Households	32.2	30.1	28.9	28.8	2.33
Weather Zone					
Fewer than 2,000 CDD and--					
More than 7,000 HDD	30.9	28.3	25.5	24.9	6.09
5,500 to 7,000 HDD	28.9	25.8	25.8	25.4	6.28
4,000 to 5,499 HDD	30.7	29.6	28.2	28.0	4.51
Fewer than 4,000 HDD	35.0	29.4	28.4	29.4	4.64
More than 2,000 CDD and Fewer than 4,000 HDD	38.1	41.1	38.7	37.4	5.27
Year of Construction					
Before 1950	24.3	22.5	21.6	22.1	2.78
1950 to 1974	36.8	32.5	31.1	30.9	2.69
After 1974	48.3	42.6	39.7	37.7	D
Main Space Heating Fuel					
Electricity	69.4	55.4	54.6	51.5	3.87
Natural Gas	23.2	23.6	22.6	23.2	2.54
Fuel Oil/Kerosene	28.2	24.2	23.9	22.7	3.96
LPG	33.2	27.6	27.1	27.3	5.57
Wood	35.4	35.1	34.3	33.0	4.91
Other or None	19.9	24.5	26.2	23.7	12.40
Measured Heated Area of Residence (square feet)					
Less than 1,000	--	20.8	21.1	19.9	3.13
1,000 to 1,999	--	32.3	31.2	32.3	2.49
2,000 or More	--	40.4	37.6	37.4	3.23
Air Conditioning					
Yes	36.7	35.0	34.3	33.2	2.43
No	26.7	23.6	21.5	22.3	3.78
Main Water Heating Fuel					
Electricity	54.2	47.1	44.9	43.8	2.57
Natural Gas	21.9	22.8	21.9	21.7	2.41
Fuel Oil/Kerosene	17.5	16.8	16.8	16.2	5.76
LPG	25.9	25.1	22.6	20.6	5.55
Other or None	19.0	21.7	26.0	24.4	15.97
Ownership Status					
Own	37.5	34.8	32.7	33.3	2.37
Rent	21.7	20.9	22.1	20.7	3.34
Annual Family Income					
Under $10,000	22.4	22.1	21.1	21.3	3.46
$10,000 to $19,999	32.8	28.4	26.8	24.9	2.80
$20,000 to $29,999	38.1	34.6	31.3	29.6	3.23
$30,000 or More	48.1	41.3	38.1	38.1	3.35
Number of People in Household					
Single Person	18.2	19.0	18.2	17.7	3.90
2 to 4 People	33.7	31.2	30.8	31.1	2.34
5 or More People	44.3	41.0	39.1	38.3	3.87
Age of Household Head					
Less than 25 Years	22.2	23.3	21.1	23.1	5.04
25 to 59 Years	36.1	33.0	31.9	31.4	2.66
60 Years or Older	26.7	25.3	24.3	24.7	3.24

See footnotes at end of table.

Table 18. Average Residential Consumption for Site Electricity, 1978 Through 1984 (Continued)

Northeast

Household Characteristics	Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	1.41	0.86	0.95	0.87	
All Households	22.5	22.2	21.2	22.3	4.50
Census Division					
New England	--	22.3	22.5	22.6	5.19
Middle Atlantic	--	22.1	20.8	22.2	5.88
Weather Zone					
Fewer than 2,000 CDD and--					
More than 7,000 HDD	Q	30.0	24.4	26.8	9.74
5,500 to 7,000 HDD	24.1	23.6	23.5	24.0	6.27
4,000 to 5,499 HDD	19.6	19.1	18.3	19.7	9.17
Year of Construction					
Before 1950	17.9	17.3	17.4	17.7	5.41
1950 to 1974	28.2	25.8	23.8	26.2	4.89
After 1974	31.4	38.4	32.4	35.1	D
Main Space Heating Fuel					
Electricity	54.5	54.7	47.5	53.1	8.74
Natural Gas	18.9	17.5	17.4	18.5	4.86
Fuel Oil/Kerosene	20.1	18.1	19.3	19.1	5.11
LPG	Q	18.5	13.1	18.2	34.84
Wood	Q	35.9	30.3	32.2	8.72
Other or None	Q	25.7	23.7	26.4	18.66
Measured Heated Area of Residence (square feet)					
Less than 1,000	--	13.4	14.3	13.9	7.45
1,000 to 1,999	--	23.1	22.3	24.1	6.11
2,000 or More	--	31.0	28.2	29.6	5.32
Air Conditioning					
Yes	24.4	24.0	23.7	24.9	4.89
No	20.9	20.4	18.5	19.6	6.85
Main Water Heating Fuel					
Electricity	44.1	40.9	38.5	40.3	4.83
Natural Gas	17.7	17.4	16.9	18.0	4.36
Fuel Oil/Kerosene	15.5	15.7	15.9	15.9	5.91
LPG	18.7	20.7	16.4	17.5	16.42
Other or None	--	37.4	32.2	25.0	19.77
Ownership Status					
Own	26.7	27.2	24.4	26.4	3.96
Rent	16.4	13.7	15.8	14.4	8.72
Annual Family Income					
Under $10,000	14.4	14.4	15.2	16.3	7.71
$10,000 to $19,999	22.6	20.2	19.2	17.9	7.35
$20,000 to $29,999	26.5	27.2	22.1	23.4	5.51
$30,000 or More	36.3	31.8	28.6	28.8	6.05
Number of People in Household					
Single Person	12.7	12.8	13.3	14.1	11.04
2 to 4 People	23.0	22.7	22.3	23.0	4.70
5 or More People	33.3	33.1	31.0	34.0	6.77
Age of Household Head					
Less than 25 Years	17.0	14.8	15.0	15.6	14.42
25 to 59 Years	24.9	25.0	24.0	24.5	4.57
60 Years or Older	18.2	16.4	16.8	19.3	7.30

See footnotes at end of table.

Table 18. Average Residential Consumption for Site Electricity, 1978 Through 1984 (Continued)

North Central

Household Characteristics	Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	1.41	0.86	0.95	0.87	
All Households	28.9	28.4	27.0	25.2	5.56
Census Division					
East North Central	--	27.3	25.8	24.0	8.18
West North Central	--	31.1	29.8	28.0	4.35
Weather Zone					
Fewer than 2,000 CDD and--					
More than 7,000 HDD	25.4	28.9	26.4	23.7	7.17
5,500 to 7,000 HDD	28.6	26.4	26.2	24.5	9.50
4,000 to 5,499 HDD	30.6	33.5	29.9	28.9	7.06
Year of Construction					
Before 1950	24.4	23.6	21.3	22.6	4.28
1950 to 1974	31.8	30.1	28.8	25.5	6.19
After 1974	45.4	41.4	39.4	31.4	D
Main Space Heating Fuel					
Electricity	86.1	62.2	64.9	66.7	9.14
Natural Gas	23.1	22.4	20.7	20.9	2.88
Fuel Oil/Kerosene	34.9	34.9	31.5	26.6	9.14
LPG	35.5	28.4	29.7	29.2	9.62
Wood	Q	34.9	33.9	31.2	11.66
Other or None	Q	Q	Q	Q	Q
Measured Heated Area of Residence (square feet)					
Less than 1,000	--	18.8	18.5	17.5	6.31
1,000 to 1,999	--	28.9	28.6	26.7	6.12
2,000 or More	--	37.2	34.0	33.4	6.89
Air Conditioning					
Yes	31.1	31.5	31.4	27.8	6.10
No	25.7	24.1	20.9	21.4	6.63
Main Water Heating Fuel					
Electricity	52.5	46.4	44.6	41.2	8.18
Natural Gas	22.6	22.1	20.4	20.2	3.12
Fuel Oil/Kerosene	Q	18.3	Q	Q	27.87
LPG	27.3	27.4	28.5	22.3	10.13
Other or None	Q	18.5	Q	28.9	28.63
Ownership Status					
Own	32.8	32.3	30.2	29.5	5.29
Rent	17.2	19.9	20.4	16.9	7.43
Annual Family Income					
Under $10,000	19.4	20.1	18.2	17.8	4.89
$10,000 to $19,999	28.1	27.5	26.1	21.2	7.07
$20,000 to $29,999	33.9	32.1	31.3	27.0	6.67
$30,000 or More	44.4	39.6	34.6	36.0	7.18
Number of People in Household					
Single Person	14.2	17.3	15.5	13.8	6.56
2 to 4 People	29.3	28.4	28.5	28.6	5.70
5 or More People	41.3	40.9	38.0	35.5	7.95
Age of Household Head					
Less than 25 Years	19.4	19.7	20.6	17.8	11.19
25 to 59 Years	33.4	32.0	29.6	28.7	6.42
60 Years or Older	22.6	23.1	22.8	20.0	6.01

See footnotes at end of table.

Table 18. Average Residential Consumption for Site Electricity, 1978 Through 1984 (Continued)

South

Household Characteristics	Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	1.41	0.86	0.95	0.87	
All Households	40.8	39.3	37.4	36.3	3.44
Census Division					
South Atlantic	--	37.0	34.5	33.8	4.00
East South Central	--	46.9	44.4	43.9	5.55
West South Central	--	38.3	37.4	35.4	8.59
Weather Zone					
Fewer than 2,000 CDD and--					
5,500 to 7,000 HDD	Q	--	--	--	Q
4,000 to 5,499 HDD	36.5	34.2	34.3	32.5	6.97
Fewer than 4,000 HDD	46.2	39.3	37.1	36.7	5.33
More than 2,000 CDD and Fewer than 4,000 HDD	38.0	41.9	39.4	38.0	5.66
Year of Construction					
Before 1950	30.8	29.0	27.3	27.4	5.73
1950 to 1974	43.9	40.8	38.9	37.4	3.91
After 1974	52.8	50.7	48.8	45.9	D
Main Space Heating Fuel					
Electricity	62.3	57.0	56.1	50.4	5.74
Natural Gas	30.8	32.1	31.0	30.4	5.42
Fuel Oil/Kerosene	39.0	32.6	31.1	30.6	4.96
LPG	32.8	28.7	28.0	27.9	7.48
Wood	32.2	35.2	35.8	33.9	7.24
Other or None	19.7	30.0	Q	Q	17.69
Measured Heated Area of Residence (square feet)					
Less than 1,000	--	27.1	27.9	25.3	5.01
1,000 to 1,999	--	41.8	39.6	40.7	3.28
2,000 or More	--	58.3	54.0	50.0	5.15
Air Conditioning					
Yes	46.0	44.3	41.9	40.4	3.22
No	25.7	24.9	23.3	22.4	6.07
Main Water Heating Fuel					
Electricity	52.4	49.1	46.6	44.8	3.62
Natural Gas	28.4	31.0	30.4	28.0	5.42
Fuel Oil/Kerosene	37.6	25.5	28.1	24.6	16.13
LPG	28.7	26.5	22.0	21.7	8.03
Other or None	20.4	14.2	21.1	18.7	24.39
Ownership Status					
Own	45.2	44.0	41.3	41.2	3.64
Rent	30.5	28.6	29.9	27.5	5.07
Annual Family Income					
Under $10,000	27.6	28.2	25.9	25.5	5.74
$10,000 to $19,999	42.2	37.2	35.1	32.2	4.00
$20,000 to $29,999	53.4	46.3	40.1	40.0	4.83
$30,000 or More	65.2	56.4	53.1	48.9	4.18
Number of People in Household					
Single Person	23.9	25.2	24.6	22.0	5.90
2 to 4 People	42.6	41.1	39.7	39.2	3.36
5 or More People	52.7	51.4	48.2	44.6	5.55
Age of Household Head					
Less than 25 Years	28.2	27.9	24.9	28.8	7.01
25 to 59 Years	45.3	43.4	41.4	39.3	3.73
60 Years or Older	33.7	33.5	31.5	31.6	4.72

See footnotes at end of table.

Table 18. Average Residential Consumption for Site Electricity, 1978 Through 1984 (Continued)

West

Household Characteristics	Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	1.41	0.86	0.95	0.87	
All Households	34.2	25.9	25.5	27.4	4.75
Census Division					
Mountain	--	26.8	28.4	27.0	7.55
Pacific	--	25.6	24.5	27.5	4.80
Weather Zone					
Fewer than 2,000 CDD and--					
More than 7,000 HDD	Q	24.2	23.0	26.5	7.25
5,500 to 7,000 HDD	36.2	32.5	35.4	37.9	16.80
4,000 to 5,499 HDD	70.4	43.7	39.5	39.1	12.77
Fewer than 4,000 HDD	18.4	18.3	18.6	21.0	4.71
More than 2,000 CDD and Fewer than 4,000 HDD	Q	33.3	32.4	31.3	11.39
Year of Construction					
Before 1950	27.3	20.5	21.2	21.6	7.69
1950 to 1974	35.4	26.5	25.0	27.1	5.72
After 1974	62.9	32.2	31.5	34.1	D
Main Space Heating Fuel					
Electricity	87.4	46.4	47.4	47.6	5.33
Natural Gas	18.4	20.0	18.7	21.0	3.19
Fuel Oil/Kerosene	34.3	38.9	35.4	34.5	6.38
LPG	34.7	22.6	22.8	21.9	13.94
Wood	47.4	34.2	34.9	34.0	8.93
Other or None	14.8	18.3	17.1	15.4	16.92
Measured Heated Area of Residence (square feet)					
Less than 1,000	--	19.7	19.3	19.3	6.58
1,000 to 1,999	--	27.9	27.4	29.9	4.63
2,000 or More	--	34.9	37.1	42.7	6.43
Air Conditioning					
Yes	35.3	27.2	29.7	30.6	7.07
No	33.7	25.1	23.3	25.3	7.26
Main Water Heating Fuel					
Electricity	68.6	47.0	45.7	46.9	5.06
Natural Gas	17.3	19.1	18.3	20.2	3.41
Fuel Oil/Kerosene	--	21.9	18.2	Q	34.17
LPG	Q	20.4	19.5	17.7	9.52
Other or None	Q	25.6	32.6	30.7	27.22
Ownership Status					
Own	43.9	29.7	29.9	32.3	5.22
Rent	21.0	19.3	19.0	20.3	5.94
Annual Family Income					
Under $10,000	26.4	20.6	22.0	23.4	6.69
$10,000 to $19,999	34.1	24.9	21.4	22.8	6.85
$20,000 to $29,999	38.3	29.8	27.8	26.5	7.16
$30,000 or More	46.8	30.2	30.7	33.8	6.37
Number of People in Household					
Single Person	20.4	17.8	16.8	20.6	7.65
2 to 4 People	37.1	27.1	27.2	27.9	5.28
5 or More People	51.6	33.4	34.9	36.1	8.60

See footnotes at end of table.

Table 18. Average Residential Consumption for Site Electricity, 1978 Through 1984 (Continued)

West

Household Characteristics	Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	1.41	0.86	0.95	0.87	
Age of Household Head					
Less than 25 Years	20.6	25.3	20.5	24.7	11.91
25 to 59 Years	37.4	26.7	27.0	28.1	5.18
60 Years or Older	31.9	23.9	23.5	26.3	7.65

-- Data not applicable or not available.
[D] The RSEs calculated using the row and column factors are unreliable. Reliable RSE estimates for each cell are found in Appendix A.
[Q] Data withheld due to large variance (1.96 * standard error > value).
Note: To obtain a Relative Standard Error Percent (RSE) for any table cell, multiply the cell's corresponding column and row factors.
See Glossary for definition of terms used in this report.
Data may not sum to totals because of rounding.
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

Detailed Statistics

Table 19. Average Residential Prices and Expenditures for Site Electricity, 1978 Through 1984

United States

Household Characteristics	Fuel Price (Dollars per Million Btu)				Expenditures (Dollars per Household)				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.09	0.86	0.72	0.69	1.51	1.04	1.16	1.18	
All Households	$12.10	$16.32	$19.98	$21.94	$390	$492	$578	$632	1.76
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	10.84	15.84	19.04	20.16	335	449	485	502	4.80
5,500 to 7,000 HDD	12.39	17.31	20.99	23.34	357	446	542	593	4.39
4,000 to 5,499 HDD	12.64	16.63	20.74	22.74	388	493	584	636	4.61
Fewer than 4,000 HDD	11.48	15.43	18.38	19.75	401	453	523	580	3.21
More than 2,000 CDD and Fewer than 4,000 HDD	12.34	16.06	20.12	22.75	470	661	778	850	3.72
Year of Construction									
Before 1950	13.05	17.58	21.35	23.75	317	395	462	524	1.96
1950 to 1974	11.88	16.02	19.92	21.68	438	521	618	669	2.03
After 1974	10.37	15.28	18.35	20.21	501	652	728	763	D
Main Space Heating Fuel									
Electricity	9.22	13.91	17.06	19.34	640	771	931	996	3.43
Natural Gas	13.86	17.09	21.14	22.76	321	404	478	527	1.69
Fuel Oil/Kerosene	13.89	19.94	23.76	26.76	392	482	568	606	2.90
LPG	11.99	16.33	20.25	22.02	398	450	550	600	3.85
Wood	10.21	14.95	18.30	19.87	361	525	627	656	4.56
Other or None	12.18	21.91	22.27	25.49	242	536	584	605	9.54
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	17.01	20.54	22.54	--	353	434	449	2.03
1,000 to 1,999	--	16.03	19.55	21.27	--	517	610	687	2.11
2,000 or More	--	16.18	20.15	22.52	--	653	758	842	2.11
Air Conditioning									
Yes	12.50	16.29	20.01	21.91	458	571	686	727	1.85
No	11.41	16.36	19.89	21.99	304	386	428	491	2.72
Main Water Heating Fuel									
Electricity	10.16	14.32	17.48	19.58	551	674	785	859	2.58
Natural Gas	14.29	17.50	21.76	23.58	312	400	476	513	1.63
Fuel Oil/Kerosene	17.41	25.50	30.24	34.33	304	429	508	558	3.34
LPG	13.15	17.41	21.41	23.85	341	438	484	493	3.93
Other or None	12.53	20.31	22.83	23.99	238	441	593	586	8.85
Ownership Status									
Own	11.87	16.06	19.76	21.83	446	559	647	727	1.87
Rent	12.92	17.17	20.57	22.24	280	359	454	461	2.14
Annual Family Income									
Under $10,000	12.40	16.46	20.37	22.00	278	364	429	469	2.33
$10,000 to $19,999	12.00	16.32	19.81	21.79	394	464	531	542	2.07
$20,000 to $29,999	12.09	15.87	19.50	21.53	461	550	611	637	2.16
$30,000 or More	11.93	16.62	20.21	22.20	574	687	771	845	2.45
Number of People in Household									
Single Person	12.48	16.84	20.76	22.39	227	320	377	395	2.67
2 to 4 People	12.05	16.23	19.78	21.78	406	506	610	677	1.78
5 or More People	12.10	16.28	20.10	22.22	536	667	787	850	2.59
Age of Household Head									
Less than 25 Years	12.85	15.84	19.56	21.18	285	369	414	489	3.20
25 to 59 Years	12.04	16.34	19.82	21.81	434	539	633	684	1.89
60 Years or Older	12.12	16.36	20.52	22.45	324	414	499	554	2.36

See footnotes at end of table.

Table 19. Average Residential Prices and Expenditures for Site Electricity, 1978 Through 1984 (Continued)

Northeast

Household Characteristics	Fuel Price (Dollars per Million Btu)				Expenditures (Dollars per Household)				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.09	0.86	0.72	0.69	1.51	1.04	1.16	1.18	
All Households	$15.34	$21.99	$27.46	$29.77	$345	$487	$582	$665	2.98
Census Division									
New England	--	21.83	24.99	28.03	--	487	562	635	2.95
Middle Atlantic	--	22.04	28.28	30.31	--	487	588	674	3.65
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	Q	17.30	22.11	23.75	Q	520	540	638	7.11
5,500 to 7,000 HDD	14.81	20.06	24.21	27.02	356	473	569	649	4.93
4,000 to 5,499 HDD	17.36	25.88	32.87	34.83	341	494	603	686	5.05
Year of Construction									
Before 1950	16.41	22.90	28.30	31.71	294	396	493	561	3.17
1950 to 1974	14.85	22.08	27.57	29.11	419	571	655	764	3.66
After 1974	12.36	18.87	24.26	25.87	388	725	787	908	D
Main Space Heating Fuel									
Electricity	10.71	17.83	22.81	25.23	584	975	1,082	1,340	7.19
Natural Gas	16.74	23.04	29.48	31.37	317	403	513	582	4.67
Fuel Oil/Kerosene	16.37	24.73	28.80	31.86	330	447	556	609	3.25
LPG	Q	21.88	24.34	26.14	Q	405	320	476	19.81
Wood	Q	17.27	22.78	24.80	Q	620	690	797	8.84
Other or None	Q	20.85	24.90	27.21	Q	536	591	718	11.57
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	25.64	29.98	31.55	--	343	430	438	4.34
1,000 to 1,999	--	21.29	26.79	29.18	--	492	598	703	4.03
2,000 or More	--	20.87	26.63	29.45	--	647	750	872	3.59
Air Conditioning									
Yes	16.17	23.16	28.43	30.50	394	555	673	761	3.40
No	14.54	20.67	26.11	28.82	305	421	483	566	3.99
Main Water Heating Fuel									
Electricity	11.90	18.36	23.39	25.00	524	750	900	1,008	4.80
Natural Gas	17.34	23.05	29.47	31.99	308	400	499	575	3.95
Fuel Oil/Kerosene	18.32	26.85	31.59	35.48	285	421	502	562	3.41
LPG	16.36	20.17	23.20	29.29	306	417	381	512	10.27
Other or None	--	20.13	23.34	24.91	--	753	752	623	11.33
Ownership Status									
Own	15.26	21.02	26.80	29.20	408	571	654	771	2.90
Rent	15.54	25.26	29.16	31.80	255	346	461	458	4.79
Annual Family Income									
Under $10,000	16.36	23.70	27.74	28.19	236	340	421	461	4.31
$10,000 to $19,999	15.15	22.03	27.29	29.60	342	446	524	531	4.47
$20,000 to $29,999	15.36	20.47	27.26	28.75	407	557	601	671	4.00
$30,000 or More	14.57	22.49	27.56	31.03	530	716	789	893	3.89
Number of People in Household									
Single Person	15.71	23.77	27.59	29.33	200	304	368	412	5.89
2 to 4 People	15.14	21.68	27.41	29.75	348	493	612	684	3.15
5 or More People	15.75	22.02	27.52	30.21	525	729	852	1,028	4.00
Age of Household Head									
Less than 25 Years	14.55	22.88	26.45	29.77	247	339	397	464	8.08
25 to 59 Years	15.35	21.77	27.25	29.95	382	544	655	734	3.08
60 Years or Older	15.54	22.70	28.16	29.36	283	373	474	565	4.60

See footnotes at end of table.

Detailed Statistics

Table 19. Average Residential Prices and Expenditures for Site Electricity, 1978 Through 1984 (Continued)

North Central

Household Characteristics	Fuel Price (Dollars per Million Btu)				Expenditures (Dollars per Household)				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.09	0.86	0.72	0.69	1.51	1.04	1.16	1.18	
All Households	$13.64	$16.12	$19.55	$21.64	$394	$458	$527	$546	3.32
Census Division									
East North Central	--	16.38	19.91	22.18	--	447	514	533	5.04
West North Central	--	15.57	18.80	20.55	--	485	560	575	3.50
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	13.68	15.87	18.62	19.45	347	459	492	461	4.74
5,500 to 7,000 HDD	13.74	16.63	20.22	22.77	393	439	529	558	5.53
4,000 to 5,499 HDD	13.50	15.24	19.03	21.34	413	511	568	617	4.53
Year of Construction									
Before 1950	14.18	16.91	20.58	22.72	346	398	439	513	3.06
1950 to 1974	13.43	15.96	19.75	21.69	428	480	569	552	3.42
After 1974	12.28	14.76	17.27	19.58	558	611	680	614	D
Main Space Heating Fuel									
Electricity	10.57	13.33	15.81	17.25	910	829	1,026	1,151	6.92
Natural Gas	14.61	17.24	21.21	22.91	338	387	439	478	2.20
Fuel Oil/Kerosene	13.16	15.62	19.30	21.10	460	545	608	562	5.95
LPG	13.62	16.75	20.19	22.13	484	475	599	646	5.51
Wood	13.45	15.94	18.75	20.52	Q	556	635	639	7.62
Other or None	Q	16.43	Q	Q	Q	Q	Q	Q	20.05
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	17.27	20.08	22.00	--	324	372	384	3.98
1,000 to 1,999	--	15.99	19.31	21.29	--	463	552	568	3.78
2,000 or More	--	15.67	19.49	21.77	--	583	663	726	4.19
Air Conditioning									
Yes	13.57	15.70	19.18	21.46	422	495	603	596	3.50
No	13.76	16.87	20.30	21.99	353	406	425	471	3.99
Main Water Heating Fuel									
Electricity	11.97	14.41	17.11	19.07	628	669	763	785	5.04
Natural Gas	14.66	17.37	21.57	23.28	332	384	440	471	2.27
Fuel Oil/Kerosene	Q	15.11	Q	Q	Q	276	Q	Q	16.91
LPG	13.80	16.61	19.22	22.73	376	456	548	507	6.22
Other or None	18.41	17.49	Q	22.62	232	324	Q	653	19.77
Ownership Status									
Own	13.40	15.84	19.39	21.34	440	512	585	629	3.17
Rent	15.01	17.10	20.02	22.66	258	340	409	382	4.46
Annual Family Income									
Under $10,000	14.75	16.76	20.79	23.01	286	337	378	410	3.63
$10,000 to $19,999	13.63	16.12	19.13	22.25	383	444	499	471	3.95
$20,000 to $29,999	13.50	15.73	19.19	21.11	457	504	601	571	3.92
$30,000 or More	12.72	15.97	19.44	20.87	565	633	673	752	4.57
Number of People in Household									
Single Person	15.51	17.23	20.48	23.21	220	298	317	320	4.42
2 to 4 People	13.64	16.13	19.33	21.39	399	458	551	613	3.46
5 or More People	13.04	15.55	19.68	21.20	539	635	748	752	4.51
Age of Household Head									
Less than 25 Years	14.60	16.55	19.90	21.63	283	326	410	384	5.82
25 to 59 Years	13.43	16.01	19.34	21.25	449	513	573	611	3.77
60 Years or Older	14.02	16.33	20.04	22.74	316	377	457	455	3.70

See footnotes at end of table.

Table 19. Average Residential Prices and Expenditures for Site Electricity, 1978 Through 1984 (Continued)

South

Household Characteristics	Fuel Price (Dollars per Million Btu)				Expenditures (Dollars per Household)				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.09	0.86	0.72	0.69	1.51	1.04	1.16	1.18	
All Households	$11.75	$15.10	$18.73	$20.39	$480	$593	$700	$740	2.79
Census Division									
South Atlantic	--	16.33	19.44	21.66	--	604	671	732	4.63
East South Central	--	12.62	15.44	16.19	--	592	686	710	4.63
West South Central	--	14.95	20.26	21.79	--	572	759	773	4.45
Weather Zone									
Fewer than 2,000 CDD and--									
5,500 to 7,000 HDD	Q	--	--	--	Q	--	--	--	Q
4,000 to 5,499 HDD	13.24	16.01	18.84	19.44	483	548	647	632	8.08
Fewer than 4,000 HDD	10.99	13.98	17.31	18.39	507	550	643	675	3.76
More than 2,000 CDD and Fewer than 4,000 HDD	12.39	15.65	19.90	22.52	471	656	784	855	3.98
Year of Construction									
Before 1950	11.97	15.63	19.06	20.93	368	453	521	573	3.73
1950 to 1974	11.75	14.86	18.75	20.39	516	606	730	763	3.01
After 1974	11.33	15.19	18.36	19.92	599	771	896	914	D
Main Space Heating Fuel									
Electricity	10.93	14.63	17.91	20.00	681	834	1,004	1,008	4.04
Natural Gas	12.43	15.06	19.36	20.74	383	483	600	631	3.49
Fuel Oil/Kerosene	12.73	17.43	19.65	21.22	496	569	610	649	4.36
LPG	11.55	15.97	20.14	22.09	378	458	564	616	5.05
Wood	11.45	14.22	17.88	19.10	368	501	639	646	4.98
Other or None	12.18	14.14	Q	Q	240	425	Q	Q	14.39
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	15.62	19.39	21.42	--	424	542	542	3.29
1,000 to 1,999	--	15.07	18.51	20.07	--	630	734	817	3.31
2,000 or More	--	14.64	18.37	19.93	--	854	991	996	4.07
Air Conditioning									
Yes	11.68	14.92	18.62	20.26	537	661	780	818	2.67
No	12.15	16.01	19.34	21.18	312	398	451	474	4.69
Main Water Heating Fuel									
Electricity	11.30	14.66	17.73	19.69	592	720	827	881	3.27
Natural Gas	12.74	15.36	19.88	21.41	362	477	605	600	3.51
Fuel Oil/Kerosene	13.43	20.86	22.25	23.68	505	533	625	582	9.13
LPG	11.96	16.95	21.40	23.05	344	448	471	499	6.15
Other or None	12.34	17.10	23.59	25.13	252	242	497	470	13.34
Ownership Status									
Own	11.59	14.95	18.50	20.23	524	657	764	833	3.02
Rent	12.33	15.60	19.33	20.82	376	446	577	573	3.37
Annual Family Income									
Under $10,000	11.98	15.35	19.23	20.57	330	433	497	525	3.83
$10,000 to $19,999	11.71	15.02	18.72	20.83	494	559	657	671	2.96
$20,000 to $29,999	11.69	14.61	18.05	19.70	625	676	723	787	3.37
$30,000 or More	11.57	15.38	18.89	20.34	755	867	1,002	994	3.44
Number of People in Household									
Single Person	12.30	15.75	19.60	21.30	294	397	483	469	3.74
2 to 4 People	11.76	15.05	18.60	20.21	501	619	738	793	2.71
5 or More People	11.40	14.77	18.48	20.51	601	759	890	915	3.97
Age of Household Head									
Less than 25 Years	12.64	15.39	19.27	20.84	356	430	479	601	4.21
25 to 59 Years	11.58	15.04	18.58	20.20	525	653	769	793	2.84
60 Years or Older	12.11	15.19	19.06	20.82	408	509	600	657	3.67

See footnotes at end of table.

Table 19. Average Residential Prices and Expenditures for Site Electricity, 1978 Through 1984 (Continued)

West

Household Characteristics	Fuel Price (Dollars per Million Btu)				Expenditures (Dollars per Household)				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.09	0.86	0.72	0.69	1.51	1.04	1.16	1.18	
All Households	$8.28	$14.34	$16.91	$18.94	$283	$371	$431	$518	3.80
Census Division									
Mountain	--	15.50	18.33	19.95	--	416	520	539	5.91
Pacific	--	13.92	16.33	18.58	--	356	400	511	4.01
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	Q	13.54	17.14	18.22	Q	327	395	483	7.52
5,500 to 7,000 HDD	8.01	10.82	13.97	15.15	290	352	495	575	11.27
4,000 to 5,499 HDD	5.46	8.19	10.70	13.74	384	358	423	537	9.92
Fewer than 4,000 HDD	13.29	18.90	20.80	22.51	245	345	387	472	3.27
More than 2,000 CDD and Fewer than 4,000 HDD	Q	21.33	22.33	25.70	Q	711	724	804	6.50
Year of Construction									
Before 1950	8.51	14.04	15.89	17.65	233	288	337	381	6.29
1950 to 1974	8.72	14.59	17.35	19.54	308	387	434	529	4.89
After 1974	5.61	14.03	16.91	18.88	353	452	533	643	D
Main Space Heating Fuel									
Electricity	5.32	9.59	13.62	16.13	465	445	646	768	6.62
Natural Gas	12.69	17.22	19.31	21.10	233	344	360	444	2.83
Fuel Oil/Kerosene	7.56	8.52	10.79	12.94	259	332	382	447	8.03
LPG	9.71	15.06	20.07	19.79	337	340	458	434	11.97
Wood	Q	11.81	14.57	16.45	268	404	509	559	12.53
Other or None	10.06	32.68	32.94	34.64	149	597	563	534	12.63
Measured Heated Area of Residence *(square feet)*									
Less than 1,000	--	14.35	17.40	19.76	--	283	336	382	4.46
1,000 to 1,999	--	14.43	16.70	18.65	--	403	458	557	3.85
2,000 or More	--	14.17	16.64	18.49	--	494	617	790	5.77
Air Conditioning									
Yes	9.71	16.40	18.28	20.31	342	447	543	621	5.41
No	7.63	13.08	15.97	17.88	257	329	372	453	4.90
Main Water Heating Fuel									
Electricity	5.67	9.41	12.81	15.56	389	443	586	729	5.52
Natural Gas	13.37	17.93	19.98	21.53	231	342	365	434	2.76
Fuel Oil/Kerosene	--	19.31	35.43	Q	--	423	644	Q	32.62
LPG	Q	19.20	24.96	24.37	Q	392	487	431	8.41
Other or None	Q	26.25	22.59	23.07	Q	671	736	708	17.00
Ownership Status									
Own	7.67	14.45	16.95	19.04	337	429	508	614	4.24
Rent	10.01	14.06	16.80	18.70	210	272	319	379	4.73
Annual Family Income									
Under $10,000	8.30	13.73	16.78	19.15	219	283	370	449	5.11
$10,000 to $19,999	7.84	14.19	16.72	18.04	267	354	357	412	4.86
$20,000 to $29,999	8.23	14.07	16.63	18.40	315	419	462	487	5.27
$30,000 or More	9.04	15.35	17.34	19.59	423	463	532	661	5.44
Number of People in Household									
Single Person	9.12	13.68	17.65	18.44	186	243	296	379	6.32
2 to 4 People	8.13	14.43	16.79	19.00	301	391	456	531	4.19
5 or More People	8.07	14.58	16.67	19.18	416	487	582	692	6.87

See footnotes at end of table.

Table 19. Average Residential Prices and Expenditures for Site Electricity, 1978 Through 1984 (Continued)

West

Household Characteristics	Fuel Price (Dollars per Million Btu)				Expenditures (Dollars per Household)				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.09	0.86	0.72	0.69	1.51	1.04	1.16	1.18	
Age of Household Head									
Less than 25 Years	9.71	13.09	16.05	17.86	200	331	330	442	8.33
25 to 59 Years	8.27	14.53	16.80	19.07	310	388	453	536	4.00
60 Years or Older	8.00	14.19	17.42	18.89	256	339	410	496	5.75

-- Data not applicable or not available.
D The RSEs calculated using the row and column factors are unreliable. Reliable RSE estimates for each cell are found in Appendix A.
Q Data withheld due to large variance (1.96 * standard error > value).
Note: To obtain a Relative Standard Error Percent (RSE) for any table cell, multiply the cell's corresponding column and row factors.
See Glossary for definition of terms used in this report.
Data may not sum to totals because of rounding.
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

Table 20. Counts of U.S. Households Using Electricity, 1978 Through 1984

United States

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.33	0.87	0.98	0.89	1.33	0.87	0.98	0.89	
All Households	76.6	81.6	83.7	86.3	100.0%	100.0%	100.0%	100.0%	A
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	6.3	8.5	8.5	9.0	8.2	10.4	10.2	10.4	19.98
5,500 to 7,000 HDD	21.6	20.9	21.0	21.5	28.2	25.7	25.1	24.9	7.72
4,000 to 5,499 HDD	20.3	21.1	22.1	22.5	26.5	25.9	26.4	26.1	9.23
Fewer than 4,000 HDD	16.8	19.0	19.6	19.9	22.0	23.3	23.4	23.1	8.47
More than 2,000 CDD and Fewer than 4,000 HDD	11.6	12.1	12.6	13.3	15.2	14.8	15.0	15.4	8.23
Year of Construction									
Before 1950	32.7	30.8	30.6	32.2	42.7	37.7	36.5	37.3	3.45
1950 to 1974	38.7	39.5	40.2	39.0	50.5	48.4	48.1	45.2	3.10
After 1974	5.2	11.3	12.9	15.1	6.8	13.9	15.4	17.5	D
Main Space Heating Fuel									
Electricity	12.1	14.3	13.4	14.5	15.8	17.5	16.0	16.8	7.73
Natural Gas	41.8	44.6	47.5	47.8	54.6	54.6	56.7	55.5	3.42
Fuel Oil/Kerosene	16.9	13.4	12.0	12.2	22.1	16.4	14.4	14.1	5.69
LPG	3.1	3.7	3.8	3.9	4.1	4.5	4.5	4.5	11.98
Wood	1.8	4.7	5.6	6.4	2.4	5.8	6.7	7.4	13.15
Other or None	.8	1.0	1.5	1.4	1.0	1.2	1.7	1.6	25.03
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	28.5	30.3	31.8	--	34.9	36.1	36.9	3.19
1,000 to 1,999	--	34.0	35.6	36.4	--	41.6	42.5	42.2	2.45
2,000 or More	--	19.1	17.9	18.0	--	23.4	21.3	20.9	4.02
Air Conditioning									
Yes	42.8	46.7	48.7	51.5	55.9	57.2	58.1	59.7	2.71
No	33.8	34.9	35.1	34.8	44.1	42.8	41.9	40.3	3.70
Main Water Heating Fuel									
Electricity	25.0	26.1	26.6	28.9	32.7	32.0	31.8	33.5	4.90
Natural Gas	42.1	44.1	47.1	46.9	55.0	54.1	56.2	54.3	3.31
Fuel Oil/Kerosene	5.8	7.1	5.7	5.4	7.5	8.7	6.8	6.3	7.99
LPG	3.1	3.6	3.4	3.8	4.0	4.4	4.1	4.4	12.39
Other or None	.6	.8	1.0	1.2	.7	.9	1.2	1.4	18.32
Ownership Status									
Own	51.0	54.3	53.9	55.3	66.6	66.6	64.4	64.1	1.91
Rent	25.6	27.3	29.8	31.0	33.4	33.4	35.6	35.9	3.61
Annual Family Income									
Under $10,000	25.6	24.2	23.1	21.9	33.5	29.6	27.6	25.3	3.66
$10,000 to $19,999	26.2	25.7	22.2	22.1	34.3	31.5	26.5	25.6	2.87
$20,000 to $29,999	15.6	17.3	18.2	16.9	20.4	21.2	21.7	19.5	3.90
$30,000 or More	9.1	14.4	20.2	25.5	11.9	17.7	24.2	29.5	4.80
Number of People in Household									
Single Person	14.4	15.7	19.2	20.3	18.8	19.3	23.0	23.6	3.63
2 to 4 People	51.6	55.0	54.1	55.5	67.4	67.4	64.6	64.4	1.19
5 or More People	10.6	10.9	10.4	10.4	13.8	13.3	12.4	12.1	4.66
Age of Household Head									
Less than 25 Years	6.8	6.6	6.0	6.1	8.9	8.1	7.1	7.1	7.14
25 to 59 Years	48.7	53.2	53.4	54.6	63.6	65.1	63.7	63.3	1.55
60 Years or Older	21.1	21.8	24.4	25.6	27.6	26.7	29.1	29.6	3.64

See footnotes at end of table.

Table 20. Counts of U.S. Households Using Electricity, 1978 Through 1984 (Continued)

Northeast

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.33	0.87	0.98	0.89	1.33	0.87	0.98	0.89	
All Households	17.4	17.7	18.0	18.3	100.0%	100.0%	100.0%	100.0%	A
Census Division									
New England	—	4.3	4.2	4.3	—	24.2	23.5	23.3	7.94
Middle Atlantic	—	13.4	13.7	14.0	—	75.8	76.5	76.7	2.46
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	Q	Q	Q	1.9	Q	Q	Q	10.1	55.36
5,500 to 7,000 HDD	6.1	7.8	8.0	8.1	35.3	44.4	44.7	44.1	14.96
4,000 to 5,499 HDD	8.4	8.1	8.3	8.4	48.5	45.8	46.3	45.8	10.31
Year of Construction									
Before 1950	10.0	9.6	9.4	10.1	57.5	54.5	52.1	55.4	6.01
1950 to 1974	6.3	6.7	7.1	6.4	36.2	37.7	39.5	35.2	8.39
After 1974	Q	1.4	1.5	1.7	Q	7.8	8.4	9.4	D
Main Space Heating Fuel									
Electricity	1.4	1.6	1.3	1.4	8.3	8.9	7.3	7.5	25.44
Natural Gas	7.0	6.6	7.5	7.2	40.1	37.5	42.0	39.2	11.01
Fuel Oil/Kerosene	8.8	8.2	7.6	8.2	50.8	46.4	42.1	44.7	6.36
LPG	.1	Q	Q	.2	.5	Q	Q	.9	47.03
Wood	Q	1.0	1.0	1.1	Q	5.4	5.6	6.0	45.16
Other or None	Q	.1	.3	.3	Q	.8	1.9	1.6	40.31
Measured Heated Area of Residence (square feet)									
Less than 1,000	—	5.9	6.0	6.1	—	33.3	33.5	33.3	5.57
1,000 to 1,999	—	6.6	7.1	6.8	—	37.6	39.8	37.2	6.26
2,000 or More	—	5.1	4.8	5.4	—	29.0	26.7	29.5	7.45
Air Conditioning									
Yes	7.9	8.7	9.4	9.3	45.4	49.2	52.1	50.8	6.80
No	9.5	9.0	8.6	9.0	54.6	50.8	47.9	49.2	6.64
Main Water Heating Fuel									
Electricity	3.6	3.9	3.7	4.0	20.4	21.8	20.5	21.9	14.29
Natural Gas	8.1	7.2	8.7	8.5	46.5	40.8	48.3	46.2	9.55
Fuel Oil/Kerosene	5.2	6.1	5.0	5.1	29.8	34.5	28.1	27.9	7.72
LPG	.6	.3	.4	.5	3.2	1.9	2.1	2.9	33.65
Other or None	—	.2	.2	.2	—	.9	1.0	1.1	43.13
Ownership Status									
Own	10.2	11.1	11.3	12.1	59.0	62.9	62.8	66.0	3.34
Rent	7.1	6.6	6.7	6.2	41.0	37.1	37.2	34.0	5.62
Annual Family Income									
Under $10,000	5.7	4.7	4.7	4.1	33.1	26.9	26.2	22.6	6.32
$10,000 to $19,999	5.6	6.0	4.6	4.1	32.4	33.8	25.9	22.6	5.98
$20,000 to $29,999	3.8	4.0	4.0	4.0	21.7	22.8	22.3	22.0	8.35
$30,000 or More	2.2	2.9	4.6	6.0	12.8	16.5	25.6	32.8	8.15
Number of People in Household									
Single Person	3.4	3.5	4.4	4.1	19.7	20.1	24.7	22.7	7.16
2 to 4 People	11.4	11.7	11.2	11.9	65.5	66.3	62.6	65.0	2.38
5 or More People	2.6	2.4	2.3	2.3	14.8	13.7	12.7	12.3	8.53
Age of Household Head									
Less than 25 Years	1.4	.9	1.0	.9	7.8	5.2	5.3	5.1	14.99
25 to 59 Years	11.4	12.0	11.1	11.3	65.9	68.0	62.0	61.9	3.30
60 Years or Older	4.6	4.7	5.9	6.0	26.3	26.8	32.7	33.0	7.21

See footnotes at end of table.

Table 20. Counts of U.S. Households Using Electricity, 1978 Through 1984 (Continued)

North Central

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.33	0.87	0.98	0.89	1.33	0.87	0.98	0.89	
All Households	20.6	21.1	21.3	21.6	100.0%	100.0%	100.0%	100.0%	A
Census Division									
East North Central	--	14.8	15.0	15.2	--	70.3	70.4	70.3	2.84
West North Central	--	6.3	6.3	6.4	--	29.7	29.6	29.7	6.74
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	2.8	5.3	5.5	5.5	13.3	25.1	25.8	25.2	22.80
5,500 to 7,000 HDD	10.1	11.7	11.5	11.7	49.2	55.4	53.8	54.0	9.07
4,000 to 5,499 HDD	7.7	4.1	4.3	4.5	37.5	19.5	20.4	20.8	23.12
Year of Construction									
Before 1950	10.4	9.3	9.3	9.7	50.4	44.0	43.5	44.7	7.34
1950 to 1974	9.0	9.5	9.2	8.2	43.5	45.2	43.1	37.8	6.95
After 1974	1.3	2.3	2.9	3.8	6.1	10.8	13.4	17.5	D
Main Space Heating Fuel									
Electricity	1.1	2.1	2.1	1.3	5.3	10.1	9.9	6.2	24.26
Natural Gas	15.3	15.0	15.5	16.4	74.2	71.1	72.7	75.8	4.36
Fuel Oil/Kerosene	3.1	1.5	1.6	1.2	15.1	7.3	7.4	5.4	16.20
LPG	.8	1.2	1.0	1.3	3.8	5.7	4.5	5.8	15.54
Wood	Q	1.1	1.1	1.4	Q	5.4	5.2	6.3	32.72
Other or None	Q	.1	Q	Q	Q	.4	Q	Q	60.96
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	6.3	6.8	7.8	--	29.8	32.1	36.1	6.55
1,000 to 1,999	--	8.4	8.1	7.8	--	39.7	38.2	36.0	5.51
2,000 or More	--	6.4	6.3	6.0	--	30.5	29.7	28.0	5.90
Air Conditioning									
Yes	12.3	12.3	12.3	12.9	59.7	58.3	57.6	59.8	6.13
No	8.3	8.8	9.0	8.7	40.3	41.7	42.4	40.2	8.77
Main Water Heating Fuel									
Electricity	4.2	5.2	5.5	5.0	20.3	24.8	25.8	23.1	10.96
Natural Gas	15.4	14.4	14.7	15.2	74.5	68.2	68.9	70.4	4.40
Fuel Oil/Kerosene	Q	.2	Q	Q	Q	.9	Q	Q	60.25
LPG	.8	1.2	.9	1.2	4.0	5.9	4.1	5.4	21.14
Other or None	.1	.1	.1	.1	.3	.3	.6	.6	34.51
Ownership Status									
Own	15.4	14.4	14.3	14.3	74.9	68.6	67.3	66.2	3.45
Rent	5.2	6.6	7.0	7.3	25.1	31.4	32.7	33.8	7.80
Annual Family Income									
Under $10,000	6.2	6.1	5.9	6.0	30.1	28.7	27.9	27.9	7.79
$10,000 to $19,999	7.1	6.8	5.9	5.5	34.4	32.2	27.7	25.4	5.66
$20,000 to $29,999	4.6	4.7	4.5	4.7	22.4	22.5	21.3	21.9	6.78
$30,000 or More	2.7	3.5	4.9	5.4	13.1	16.6	23.1	24.9	11.06
Number of People in Household									
Single Person	3.2	3.5	4.7	6.1	15.3	16.6	22.1	28.1	7.48
2 to 4 People	14.1	14.4	13.6	13.2	68.6	68.3	63.8	61.2	2.57
5 or More People	3.3	3.2	3.0	2.3	16.1	15.1	14.1	10.7	7.91
Age of Household Head									
Less than 25 Years	1.8	1.9	1.7	1.5	8.6	9.0	7.8	7.1	13.97
25 to 59 Years	12.6	13.3	13.5	13.3	61.1	63.2	63.4	61.6	2.85
60 Years or Older	6.2	5.9	6.1	6.8	30.3	27.8	28.8	31.3	6.96

See footnotes at end of table.

Table 20. Counts of U.S. Households Using Electricity, 1978 Through 1984 (Continued)

South

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.33	0.87	0.98	0.89	1.33	0.87	0.98	0.89	
All Households	24.6	26.9	28.0	29.3	100.0%	100.0%	100.0%	100.0%	A
Census Division									
South Atlantic	--	14.0	13.9	14.8	--	52.1	49.6	50.4	3.59
East South Central	--	5.1	5.7	5.8	--	19.1	20.2	19.7	6.60
West South Central	--	7.7	8.5	8.8	--	28.8	30.2	29.9	4.85
Weather Zone									
Fewer than 2,000 CDD and--									
5,500 to 7,000 HDD	Q	--	--	--	Q	--	--	--	Q
4,000 to 5,499 HDD	2.1	5.9	6.4	6.4	8.5	22.0	22.8	22.0	24.06
Fewer than 4,000 HDD	10.0	10.0	10.4	10.7	40.8	37.2	37.0	36.5	14.24
More than 2,000 CDD and Fewer than 4,000 HDD	11.5	11.0	11.3	12.2	46.8	40.8	40.1	41.5	8.76
Year of Construction									
Before 1950	7.1	7.5	7.7	7.8	28.9	27.8	27.5	26.6	7.31
1950 to 1974	15.6	14.6	15.6	16.1	63.3	54.4	55.7	55.0	4.06
After 1974	1.9	4.8	4.7	5.4	7.8	17.8	16.8	18.4	D
Main Space Heating Fuel									
Electricity	6.7	7.7	6.8	8.4	27.3	28.7	24.3	28.7	11.05
Natural Gas	10.0	11.8	13.3	13.1	40.7	43.9	47.5	44.8	8.07
Fuel Oil/Kerosene	4.2	3.1	2.5	2.4	17.0	11.6	8.9	8.1	15.03
LPG	2.0	2.0	2.3	2.1	8.1	7.4	8.1	7.0	18.42
Wood	1.2	1.9	2.6	2.8	5.0	7.2	9.2	9.7	17.50
Other or None	.4	.3	Q	Q	1.8	1.1	Q	Q	56.55
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	9.9	10.6	11.0	--	36.9	37.6	37.4	6.25
1,000 to 1,999	--	12.3	13.2	14.1	--	45.8	47.2	48.1	4.26
2,000 or More	--	4.7	4.2	4.3	--	17.3	15.1	14.5	8.48
Air Conditioning									
Yes	18.3	20.0	21.3	22.6	74.5	74.1	75.9	77.2	2.78
No	6.3	7.0	6.8	6.7	25.5	25.9	24.1	22.8	8.54
Main Water Heating Fuel									
Electricity	12.7	13.2	13.2	15.4	51.6	48.9	47.1	52.5	6.27
Natural Gas	9.5	11.3	12.4	11.7	38.6	41.9	44.2	39.8	7.84
Fuel Oil/Kerosene	.4	.8	.4	.2	1.6	2.8	1.5	.7	37.37
LPG	1.5	1.3	1.5	1.5	6.2	4.9	5.4	5.1	23.38
Other or None	.5	.4	.5	.5	1.9	1.4	1.7	1.8	28.27
Ownership Status									
Own	17.2	18.7	18.5	18.8	70.1	69.4	66.0	64.2	3.28
Rent	7.4	8.3	9.5	10.5	29.9	30.6	34.0	35.8	6.81
Annual Family Income									
Under $10,000	9.0	9.0	8.4	8.4	36.7	33.5	30.1	28.5	6.86
$10,000 to $19,999	9.2	8.1	7.5	7.9	37.4	30.2	26.7	27.1	4.98
$20,000 to $29,999	4.1	5.1	5.8	4.6	16.8	18.8	20.8	15.7	7.32
$30,000 or More	2.3	4.7	6.3	8.4	9.2	17.5	22.5	28.7	8.89
Number of People in Household									
Single Person	4.0	5.3	6.1	6.1	16.4	19.6	21.8	20.7	7.53
2 to 4 People	17.4	18.4	18.6	19.9	70.8	68.2	66.5	67.8	1.94
5 or More People	3.1	3.3	3.3	3.4	12.8	12.2	11.7	11.5	8.37
Age of Household Head									
Less than 25 Years	2.3	2.5	2.0	2.2	9.5	9.4	7.2	7.6	11.77
25 to 59 Years	16.2	17.1	18.1	18.8	65.7	63.3	64.7	64.1	2.97
60 Years or Older	6.1	7.3	7.9	8.3	24.8	27.3	28.1	28.3	6.70

See footnotes at end of table.

Table 20. Counts of U.S. Households Using Electricity, 1978 Through 1984 (Continued)

West

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.33	0.87	0.98	0.89	1.33	0.87	0.98	0.89	
All Households	14.0	15.9	16.4	17.0	100.0%	100.0%	100.0%	100.0%	A
Census Division									
Mountain	--	4.1	4.3	4.5	--	25.7	26.1	26.4	5.76
Pacific	--	11.8	12.2	12.5	--	74.3	73.9	73.6	2.02
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	Q	1.4	1.4	1.7	Q	9.1	8.4	9.9	14.81
5,500 to 7,000 HDD	4.4	1.4	1.5	1.8	31.3	8.9	9.2	10.4	23.13
4,000 to 5,499 HDD	Q	3.0	3.0	3.2	Q	18.9	18.5	18.7	26.70
Fewer than 4,000 HDD	6.8	9.0	9.2	9.3	48.4	56.4	55.8	54.3	7.40
More than 2,000 CDD and Fewer than 4,000 HDD	Q	1.1	1.3	1.1	Q	6.8	8.1	6.7	22.75
Year of Construction									
Before 1950	5.2	4.4	4.3	4.5	37.3	27.4	26.1	26.6	7.62
1950 to 1974	7.8	8.7	8.4	8.2	56.1	54.5	50.8	48.4	5.94
After 1974	.9	2.9	3.8	4.2	6.6	18.1	23.1	24.9	D
Main Space Heating Fuel									
Electricity	2.8	2.9	3.1	3.4	20.2	17.9	19.1	19.9	14.34
Natural Gas	9.6	11.1	11.1	11.2	68.4	69.8	67.7	65.5	5.05
Fuel Oil/Kerosene	.8	.5	.4	.5	5.6	3.1	2.6	2.7	24.92
LPG	Q	.4	.4	.4	Q	2.3	2.3	2.5	31.34
Wood	.4	.6	.9	1.1	2.5	4.1	5.4	6.5	23.48
Other or None	.2	.5	.5	.5	1.4	2.8	2.9	3.0	20.96
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	6.4	6.8	6.9	--	40.2	41.6	40.7	5.65
1,000 to 1,999	--	6.6	7.1	7.7	--	41.5	43.2	45.5	4.32
2,000 or More	--	2.9	2.5	2.3	--	18.3	15.2	13.8	10.33
Air Conditioning									
Yes	4.2	5.8	5.7	6.6	30.4	36.2	35.0	38.9	11.48
No	9.7	10.2	10.7	10.4	69.6	63.8	65.0	61.1	6.18
Main Water Heating Fuel									
Electricity	4.6	3.8	4.2	4.5	33.0	24.0	25.7	26.3	12.02
Natural Gas	9.2	11.3	11.3	11.5	65.6	70.7	69.0	67.7	4.97
Fuel Oil/Kerosene	--	.0	.1	Q	--	.2	.4	Q	48.33
LPG	Q	.7	.6	.6	Q	4.2	3.9	3.6	25.73
Other or None	Q	.1	.2	.4	Q	.9	1.1	2.3	39.24
Ownership Status									
Own	8.1	10.1	9.8	10.1	57.6	63.3	59.7	59.1	4.42
Rent	5.9	5.9	6.6	7.0	42.4	36.7	40.3	40.9	6.63
Annual Family Income									
Under $10,000	4.7	4.4	4.0	3.3	33.3	27.5	24.6	19.6	7.34
$10,000 to $19,999	4.3	4.8	4.2	4.5	31.0	30.1	25.4	26.5	5.95
$20,000 to $29,999	3.1	3.4	3.8	3.5	22.1	21.6	23.1	20.5	7.22
$30,000 or More	1.9	3.3	4.4	5.7	13.6	20.9	26.9	33.4	8.71
Number of People in Household									
Single Person	3.8	3.4	4.0	4.1	27.0	21.5	24.2	23.9	7.00
2 to 4 People	8.7	10.5	10.6	10.5	61.9	66.1	64.6	61.7	2.52
5 or More People	1.6	2.0	1.8	2.5	11.1	12.4	11.2	14.4	11.93

See footnotes at end of table.

Table 20. Counts of U.S. Households Using Electricity, 1978 Through 1984 (Continued)

West

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.33	0.87	0.98	0.89	1.33	0.87	0.98	0.89	
Age of Household Head									
Less than 25 Years	1.3	1.3	1.3	1.4	9.5	8.2	8.1	8.2	14.73
25 to 59 Years	8.5	10.8	10.6	11.2	60.5	67.6	64.5	65.6	3.38
60 Years or Older	4.2	3.9	4.5	4.5	30.0	24.2	27.4	26.2	7.37

— Data not applicable or not available.
[A] The RSEs for Percent of Households values given in this row are 0.0. The RSEs for Millions of Households values will be positive but close to 0.0, because virtually all households use electricity.
[D] The RSEs calculated using the row and column factors are unreliable. Reliable RSE estimates for each cell are found in Appendix A.
[Q] Data withheld due to large variance (1.96 * standard error > value).
Note: To obtain a Relative Standard Error Percent (RSE) for any table cell, multiply the cell's corresponding column and row factors.
See Glossary for definition of terms used in this report.
Data may not sum to totals because of rounding.
Percentages are calculated on unrounded numbers.
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

Detailed Statistics

Table 21. Average Residential Consumption for Natural Gas, 1978 Through 1984

United States

Household Characteristics	Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	1.24	0.88	0.96	0.95	
All Households	113.8	95.7	88.1	89.9	2.00
Weather Zone					
Fewer than 2,000 CDD and--					
More than 7,000 HDD	146.8	120.8	106.8	108.5	4.89
5,500 to 7,000 HDD	144.1	125.3	106.9	117.0	2.74
4,000 to 5,499 HDD	108.2	88.0	85.6	83.6	5.30
Fewer than 4,000 HDD	86.8	73.5	74.0	70.0	3.46
More than 2,000 CDD and Fewer than 4,000 HDD	77.3	69.6	66.9	63.3	5.99
Year of Construction					
Before 1950	113.3	99.6	91.0	96.6	2.86
1950 to 1974	113.3	94.2	87.0	85.7	2.85
After 1974	124.6	84.0	82.0	82.0	D
Main Space Heating Fuel					
Electricity	57.8	30.3	51.9	33.0	13.50
Natural Gas	127.6	107.0	95.4	99.9	1.78
Fuel Oil/Kerosene	26.1	18.8	27.8	18.5	6.86
Wood	73.3	50.8	55.3	54.6	9.42
Other or None	45.1	41.3	Q	30.5	22.82
Measured Heated Area of Residence (square feet)					
Less than 1,000	--	66.3	62.2	64.7	3.01
1,000 to 1,999	--	100.1	89.6	93.5	2.30
2,000 or More	--	133.5	128.7	123.7	2.66
Air Conditioning					
Yes	117.8	95.3	88.9	91.1	2.38
No	108.5	96.3	87.1	88.2	2.99
Main Water Heating Fuel					
Electricity	106.5	76.1	80.1	76.8	5.82
Natural Gas	122.8	104.0	92.7	96.4	1.76
Fuel Oil/Kerosene	13.2	12.6	20.8	9.6	8.98
LPG	Q	--	--	--	Q
Other or None	54.0	85.0	Q	64.8	25.10
Ownership Status					
Own	132.7	108.3	99.4	101.7	1.86
Rent	83.2	73.4	70.3	71.3	3.45
Annual Family Income					
Under $10,000	96.4	83.4	74.9	86.2	3.71
$10,000 to $19,999	107.6	88.6	84.4	80.8	2.87
$20,000 to $29,999	130.2	107.8	88.0	83.1	2.91
$30,000 or More	155.0	114.6	107.1	104.8	3.24
Number of People in Household					
Single Person	78.2	67.2	65.7	73.9	3.77
2 to 4 People	117.1	98.8	91.9	90.7	2.20
5 or More People	149.8	123.3	114.0	117.7	3.65
Age of Household Head					
Less than 25 Years	87.0	78.0	63.4	71.3	4.58
25 to 59 Years	120.2	100.4	92.5	91.5	2.13
60 Years or Older	108.2	89.5	85.2	91.2	3.04

See footnotes at end of table.

Table 21. Average Residential Consumption for Natural Gas, 1978 Through 1984 (Continued)

Northeast

Household Characteristics	Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	1.24	0.88	0.96	0.95	
All Households	97.7	84.8	85.0	79.2	5.78
Census Division					
New England	--	76.3	79.2	80.3	8.67
Middle Atlantic	--	86.5	86.3	78.9	6.32
Weather Zone					
Fewer than 2,000 CDD and--					
More than 7,000 HDD	Q	84.5	105.7	Q	30.39
5,500 to 7,000 HDD	137.0	105.0	93.6	101.7	5.76
4,000 to 5,499 HDD	66.5	69.3	77.9	59.5	9.01
Year of Construction					
Before 1950	85.2	78.3	75.3	75.4	7.62
1950 to 1974	122.2	96.5	95.8	86.7	8.36
After 1974	92.3	91.8	139.9	85.3	D
Main Space Heating Fuel					
Electricity	Q	Q	Q	Q	Q
Natural Gas	148.2	128.1	115.9	117.4	2.99
Fuel Oil/Kerosene	22.7	17.0	27.3	16.9	7.63
Wood	--	Q	55.3	58.6	24.83
Other or None	--	Q	Q	Q	Q
Measured Heated Area of Residence (square feet)					
Less than 1,000	--	51.3	52.1	46.2	9.89
1,000 to 1,999	--	96.6	91.3	88.0	6.68
2,000 or More	--	126.6	124.8	110.1	6.47
Air Conditioning					
Yes	99.9	84.1	89.1	83.0	6.20
No	95.5	85.5	80.2	74.6	8.03
Main Water Heating Fuel					
Electricity	123.1	84.4	121.7	68.6	18.33
Natural Gas	131.9	117.5	101.7	102.7	3.55
Fuel Oil/Kerosene	11.8	13.0	20.9	9.3	7.93
LPG	Q	--	--	--	Q
Other or None	--	Q	Q	Q	Q
Ownership Status					
Own	130.2	105.6	101.6	95.5	5.28
Rent	62.1	59.5	61.9	54.2	9.01
Annual Family Income					
Under $10,000	80.5	64.7	64.8	63.6	10.11
$10,000 to $19,999	83.6	77.9	75.4	69.5	8.81
$20,000 to $29,999	117.2	100.5	86.5	66.4	7.85
$30,000 or More	158.5	122.4	116.8	104.2	7.93
Number of People in Household					
Single Person	66.7	51.7	57.9	58.6	11.88
2 to 4 People	100.5	92.6	92.2	81.3	6.38
5 or More People	127.3	104.9	107.6	110.1	6.40
Age of Household Head					
Less than 25 Years	64.9	74.2	48.4	50.8	14.15
25 to 59 Years	102.6	90.8	94.6	81.0	5.27
60 Years or Older	94.0	72.9	74.8	80.1	9.50

See footnotes at end of table.

Table 21. Average Residential Consumption for Natural Gas, 1978 Through 1984 (Continued)

North Central

Household Characteristics	Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	1.24	0.88	0.96	0.95	
All Households	155.8	129.8	110.2	118.0	2.54
Census Division					
East North Central	--	134.8	111.4	121.0	3.32
West North Central	--	117.8	107.4	110.9	3.97
Weather Zone					
Fewer than 2,000 CDD and--					
More than 7,000 HDD	159.8	122.2	103.1	104.6	6.52
5,500 to 7,000 HDD	157.3	135.8	114.1	124.7	3.60
4,000 to 5,499 HDD	152.5	117.7	106.6	112.1	4.33
Year of Construction					
Before 1950	157.4	138.6	119.5	133.4	2.38
1950 to 1974	152.8	125.1	102.6	106.5	3.64
After 1974	164.2	98.7	98.4	98.0	D
Main Space Heating Fuel					
Electricity	141.1	23.1	38.8	47.9	26.55
Natural Gas	161.5	133.3	112.3	120.1	2.35
Fuel Oil/Kerosene	44.4	48.2	41.0	36.4	22.64
Wood	Q	Q	60.3	46.2	21.19
Other or None	--	Q	--	--	Q
Measured Heated Area of Residence (square feet)					
Less than 1,000	--	93.4	81.8	88.5	4.17
1,000 to 1,999	--	135.0	109.1	127.3	3.45
2,000 or More	--	161.0	144.1	144.0	2.95
Air Conditioning					
Yes	156.5	127.0	109.3	117.3	3.25
No	154.5	134.4	111.5	119.4	3.57
Main Water Heating Fuel					
Electricity	164.4	100.5	92.1	102.7	8.35
Natural Gas	155.5	132.2	111.9	119.6	2.51
Fuel Oil/Kerosene	Q	--	--	--	Q
Other or None	Q	--	--	Q	Q
Ownership Status					
Own	165.9	142.4	120.9	129.2	2.05
Rent	129.8	105.1	91.5	99.2	4.98
Annual Family Income					
Under $10,000	139.4	120.3	98.6	117.9	4.97
$10,000 to $19,999	149.4	118.4	105.9	104.9	3.68
$20,000 to $29,999	166.0	137.9	111.6	113.5	3.98
$30,000 or More	192.7	156.3	127.8	135.0	3.48
Number of People in Household					
Single Person	112.6	99.3	86.5	99.5	5.35
2 to 4 People	156.2	129.8	113.5	120.5	2.83
5 or More People	200.0	168.0	138.0	155.9	3.52
Age of Household Head					
Less than 25 Years	131.5	96.9	86.7	84.4	6.46
25 to 59 Years	165.2	138.0	113.5	122.4	2.40
60 Years or Older	144.2	121.5	109.7	118.2	4.14

See footnotes at end of table.

Table 21. Average Residential Consumption for Natural Gas, 1978 Through 1984 (Continued)

South

Household Characteristics	Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	1.24	0.88	0.96	0.95	
All Households	87.3	83.8	77.7	80.3	4.50
Census Division					
South Atlantic	--	85.4	77.2	84.8	8.61
East South Central	--	84.6	74.6	79.6	9.75
West South Central	--	82.1	79.2	76.7	6.26
Weather Zone					
Fewer than 2,000 CDD and--					
5,500 to 7,000 HDD	Q	--	--	--	Q
4,000 to 5,499 HDD	124.0	100.6	87.4	104.1	7.86
Fewer than 4,000 HDD	91.6	90.0	83.3	83.9	6.84
More than 2,000 CDD and Fewer than 4,000 HDD	77.3	71.3	68.5	64.3	6.00
Year of Construction					
Before 1950	91.9	88.2	78.5	85.2	5.99
1950 to 1974	84.3	83.0	78.8	78.5	5.33
After 1974	80.4	71.0	69.2	75.9	D
Main Space Heating Fuel					
Electricity	37.8	32.1	48.5	30.8	22.84
Natural Gas	91.8	90.2	80.8	84.0	4.47
Fuel Oil/Kerosene	Q	27.8	26.6	33.2	19.40
Wood	70.5	44.7	53.7	64.2	25.11
Other or None	Q	--	--	Q	Q
Measured Heated Area of Residence (square feet)					
Less than 1,000	--	61.1	56.5	62.4	4.90
1,000 to 1,999	--	88.1	80.4	81.7	4.76
2,000 or More	--	119.0	116.7	109.6	7.16
Air Conditioning					
Yes	87.2	83.2	78.7	79.7	4.61
No	87.6	85.7	73.5	82.8	8.23
Main Water Heating Fuel					
Electricity	81.3	62.4	65.5	62.8	7.22
Natural Gas	89.0	88.3	80.3	84.3	4.73
Fuel Oil/Kerosene	--	Q	Q	Q	Q
Other or None	53.4	100.9	--	Q	27.83
Ownership Status					
Own	96.9	92.5	85.0	86.3	5.02
Rent	69.2	64.4	64.8	69.9	5.97
Annual Family Income					
Under $10,000	75.1	70.8	63.9	71.7	5.69
$10,000 to $19,999	84.6	78.8	80.0	76.2	5.61
$20,000 to $29,999	104.1	96.2	79.1	72.4	5.72
$30,000 or More	140.1	102.4	92.1	95.2	7.41
Number of People in Household					
Single Person	64.7	61.0	58.3	67.3	6.12
2 to 4 People	88.7	86.0	80.5	80.3	4.91
5 or More People	109.4	108.0	98.3	102.8	7.08
Age of Household Head					
Less than 25 Years	59.4	66.1	52.5	67.0	9.58
25 to 59 Years	92.1	88.3	80.7	81.1	4.67
60 Years or Older	85.6	78.9	77.5	82.0	6.50

See footnotes at end of table.

Table 21. Average Residential Consumption for Natural Gas, 1978 Through 1984 (Continued)

West

Household Characteristics	Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	1.24	0.88	0.96	0.95	
All Households	93.9	74.6	74.4	73.2	3.63
Census Division					
Mountain	—	98.0	91.9	95.2	3.01
Pacific	—	66.8	68.7	65.0	4.16
Weather Zone					
Fewer than 2,000 CDD and--					
More than 7,000 HDD	Q	121.6	118.8	115.5	3.99
5,500 to 7,000 HDD	118.6	116.8	106.0	115.5	8.55
4,000 to 5,499 HDD	Q	84.8	68.0	77.5	7.97
Fewer than 4,000 HDD	84.4	64.2	68.2	61.2	4.12
More than 2,000 CDD and Fewer than 4,000 HDD	—	45.3	46.4	50.7	12.70
Year of Construction					
Before 1950	99.1	74.4	75.4	74.3	5.81
1950 to 1974	89.0	72.9	75.4	74.7	4.44
After 1974	125.8	81.8	69.4	66.8	D
Main Space Heating Fuel					
Electricity	60.1	31.7	64.8	30.6	17.16
Natural Gas	95.8	77.1	75.5	77.5	3.53
Fuel Oil/Kerosene	—	Q	Q	26.5	48.63
Wood	Q	57.1	53.6	50.5	20.48
Other or None	53.3	53.5	Q	Q	27.11
Measured Heated Area of Residence (square feet)					
Less than 1,000	—	57.3	55.5	53.1	4.81
1,000 to 1,999	—	76.6	78.4	77.2	3.07
2,000 or More	—	101.2	111.5	114.0	5.03
Air Conditioning					
Yes	101.9	68.7	72.8	70.9	6.43
No	89.6	78.2	75.3	74.6	4.49
Main Water Heating Fuel					
Electricity	91.9	63.9	70.1	75.4	9.60
Natural Gas	94.1	75.2	74.7	73.5	3.97
Fuel Oil/Kerosene	—	—	—	Q	Q
Other or None	—	Q	Q	46.1	24.43
Ownership Status					
Own	111.2	83.2	85.0	86.9	3.63
Rent	74.9	59.1	60.0	54.7	5.38
Annual Family Income					
Under $10,000	84.7	68.0	64.4	69.5	6.40
$10,000 to $19,999	90.1	70.5	69.0	65.1	5.45
$20,000 to $29,999	102.2	81.3	73.0	64.4	4.53
$30,000 or More	109.1	81.7	89.8	85.9	5.87
Number of People in Household					
Single Person	66.8	54.2	55.4	48.8	4.87
2 to 4 People	99.5	77.0	77.2	75.1	3.51
5 or More People	136.6	94.3	104.1	100.0	8.62

See footnotes at end of table.

Table 21. Average Residential Consumption for Natural Gas, 1978 Through 1984 (Continued)

West

Household Characteristics	Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	1.24	0.88	0.96	0.95	
Age of Household Head					
Less than 25 Years	68.4	65.6	56.3	70.4	8.64
25 to 59 Years	102.3	76.0	77.7	74.3	3.99
60 Years or Older	85.9	73.2	72.3	70.7	4.58

-- Data not applicable or not available.
[D] The RSEs calculated using the row and column factors are unreliable. Reliable RSE estimates for each cell are found in Appendix A.
[Q] *Data withheld due to large variance (1.96 * standard error > value).*
Note: To obtain a Relative Standard Error Percent (RSE) for any table cell, multiply the cell's corresponding column and row factors.
See Glossary for definition of terms used in this report.
Data may not sum to totals because of rounding.
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

Detailed Statistics

Table 22. Average Residential Prices and Expenditures for Natural Gas, 1978 Through 1984

United States

Household Characteristics	Fuel Price (Dollars per Million Btu)				Expenditures (Dollars per Household)				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	0.89	0.75	0.72	0.66	1.59	1.15	1.32	1.31	
All Households	$2.74	$3.90	$5.67	$5.97	$312	$374	$500	$537	1.48
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	2.91	3.73	5.31	5.55	428	451	567	602	3.30
5,500 to 7,000 HDD	2.74	3.79	5.56	5.87	395	474	594	687	2.15
4,000 to 5,499 HDD	2.85	4.53	6.53	6.57	309	399	558	549	3.73
Fewer than 4,000 HDD	2.49	3.50	4.95	5.68	217	258	366	398	3.44
More than 2,000 CDD and Fewer than 4,000 HDD	2.69	3.89	5.76	5.91	208	271	385	374	4.87
Year of Construction									
Before 1950	2.80	4.02	5.85	6.16	317	400	532	595	1.99
1950 to 1974	2.68	3.82	5.56	5.90	304	360	484	506	1.95
After 1974	2.76	3.75	5.39	5.45	344	315	442	447	D
Main Space Heating Fuel									
Electricity	2.89	4.30	5.64	6.40	167	130	293	211	7.69
Natural Gas	2.69	3.82	5.57	5.89	343	409	531	588	1.45
Fuel Oil/Kerosene	4.79	8.11	9.22	10.07	125	153	256	187	3.69
Wood	2.50	4.23	6.10	6.23	184	215	338	340	6.59
Other or None	2.82	4.16	Q	6.78	127	172	Q	207	13.40
***Measured Heated Area of Residence* (square feet)**									
Less than 1,000	--	4.10	5.81	5.97	--	272	361	386	2.07
1,000 to 1,999	--	3.86	5.60	5.92	--	387	502	554	1.81
2,000 or More	--	3.81	5.65	6.06	--	508	727	749	1.94
Air Conditioning									
Yes	2.74	3.90	5.74	5.97	323	371	510	544	1.83
No	2.74	3.91	5.57	5.98	298	377	485	527	1.86
Main Water Heating Fuel									
Electricity	2.91	4.24	6.08	6.19	310	323	487	476	3.80
Natural Gas	2.70	3.82	5.57	5.92	331	397	517	571	1.41
Fuel Oil/Kerosene	6.43	10.43	10.46	12.66	85	131	218	122	5.03
LPG	--	--	--	--	Q	--	--	--	Q
Other or None	2.90	3.94	Q	5.44	157	335	Q	353	14.65
Ownership Status									
Own	2.69	3.82	5.60	5.96	357	413	557	607	1.64
Rent	2.88	4.13	5.82	6.00	240	303	409	428	1.89
Annual Family Income									
Under $10,000	2.74	3.97	5.70	5.85	265	331	427	505	2.22
$10,000 to $19,999	2.77	3.95	5.67	5.89	298	350	479	476	2.03
$20,000 to $29,999	2.72	3.85	5.65	6.03	354	416	497	501	2.04
$30,000 or More	2.73	3.82	5.65	6.07	423	438	605	637	2.52
Number of People in Household									
Single Person	2.80	4.04	5.78	5.86	219	272	380	434	2.35
2 to 4 People	2.75	3.89	5.67	6.00	322	384	521	545	1.56
5 or More People	2.69	3.85	5.55	6.01	403	475	633	707	2.43
Age of Household Head									
Less than 25 Years	2.86	3.80	5.47	5.81	249	296	347	414	3.02
25 to 59 Years	2.75	3.91	5.65	5.99	330	393	523	548	1.51
60 Years or Older	2.71	3.91	5.74	5.97	293	350	489	544	2.22

See footnotes at end of table.

Table 22. Average Residential Prices and Expenditures for Natural Gas, 1978 Through 1984 (Continued)

Northeast

Household Characteristics	Fuel Price (Dollars per Million Btu)				Expenditures (Dollars per Household)				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	0.89	0.75	0.72	0.66	1.59	1.15	1.32	1.31	
All Households	$3.42	$5.14	$7.28	$7.43	$334	$436	$619	$588	3.57
Census Division									
New England	--	5.96	8.46	7.81	--	455	670	626	3.93
Middle Atlantic	--	4.99	7.04	7.35	--	432	608	580	4.09
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	Q	5.60	7.69	6.70	Q	473	813	Q	12.21
5,500 to 7,000 HDD	3.24	4.58	6.76	6.72	444	481	633	684	4.40
4,000 to 5,499 HDD	3.70	5.78	7.74	8.44	246	400	603	502	4.50
Year of Construction									
Before 1950	3.47	5.16	7.45	7.66	296	404	561	578	4.23
1950 to 1974	3.33	5.10	7.01	7.06	407	492	672	612	5.37
After 1974	3.60	5.14	7.63	6.74	332	472	1,067	575	D
Main Space Heating Fuel									
Electricity	Q	Q	Q	Q	Q	Q	Q	Q	Q
Natural Gas	3.22	4.83	7.00	7.15	478	618	811	839	3.59
Fuel Oil/Kerosene	5.28	8.86	9.58	10.63	120	151	262	179	4.04
Wood	--	Q	7.30	7.34	--	Q	404	430	13.68
Other or None	--	Q	Q	Q	--	Q	Q	Q	Q
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	5.81	7.99	7.71	--	298	416	357	5.67
1,000 to 1,999	--	4.95	7.13	7.34	--	478	651	646	4.63
2,000 or More	--	4.87	7.00	7.36	--	616	873	810	4.68
Air Conditioning									
Yes	3.45	5.33	7.42	7.45	344	449	662	619	3.99
No	3.39	4.93	7.08	7.39	324	422	567	551	4.82
Main Water Heating Fuel									
Electricity	3.31	4.66	7.37	7.03	408	393	897	483	11.74
Natural Gas	3.30	4.89	7.07	7.28	435	575	719	748	3.27
Fuel Oil/Kerosene	6.87	10.39	10.57	12.89	81	135	221	119	4.50
LPG	--	--	--	--	Q	--	--	--	Q
Other or None	--	Q	Q	Q	--	Q	135	875	Q
Ownership Status									
Own	3.39	4.91	7.10	7.33	441	519	721	700	3.74
Rent	3.49	5.62	7.67	7.68	217	334	475	416	5.15
Annual Family Income									
Under $10,000	3.35	5.31	7.26	7.35	269	344	471	468	5.88
$10,000 to $19,999	3.46	5.24	7.40	7.19	289	408	558	500	5.11
$20,000 to $29,999	3.47	4.95	7.16	7.74	406	497	619	514	5.08
$30,000 or More	3.40	5.01	7.29	7.45	539	614	851	776	4.88
Number of People in Household									
Single Person	3.38	5.41	7.39	7.30	225	279	428	428	6.52
2 to 4 People	3.44	5.06	7.25	7.47	345	469	668	607	4.06
5 or More People	3.39	5.23	7.27	7.39	431	549	782	813	3.96
Age of Household Head									
Less than 25 Years	3.46	4.95	7.59	7.43	224	368	368	377	9.88
25 to 59 Years	3.42	5.16	7.22	7.44	351	469	683	603	3.51
60 Years or Older	3.40	5.11	7.36	7.41	320	372	551	593	5.10

See footnotes at end of table.

Table 22. Average Residential Prices and Expenditures for Natural Gas, 1978 Through 1984 (Continued)

North Central

Household Characteristics	Fuel Price (Dollars per Million Btu)				Expenditures (Dollars per Household)				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	0.89	0.75	0.72	0.66	1.59	1.15	1.32	1.31	
All Households	$2.57	$3.55	$5.21	$5.59	$400	$461	$574	$660	2.15
Census Division									
East North Central	--	3.67	5.27	5.75	--	495	588	696	1.98
West North Central	--	3.23	5.04	5.17	--	381	542	574	5.98
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	2.75	3.87	5.59	6.08	440	473	576	635	3.08
5,500 to 7,000 HDD	2.65	3.54	5.10	5.58	416	481	582	696	2.47
4,000 to 5,499 HDD	2.39	3.24	5.13	5.16	365	381	547	578	6.10
Year of Construction									
Before 1950	2.62	3.53	5.18	5.58	412	489	619	745	2.62
1950 to 1974	2.50	3.56	5.25	5.64	381	446	539	600	2.21
After 1974	2.63	3.74	5.14	5.50	432	369	505	538	D
Main Space Heating Fuel									
Electricity	2.24	5.10	5.74	5.84	317	118	223	280	16.61
Natural Gas	2.56	3.54	5.20	5.58	413	472	584	671	2.10
Fuel Oil/Kerosene	3.38	4.29	5.90	6.74	150	207	242	246	12.36
Wood	Q	Q	5.57	6.54	Q	Q	335	302	9.25
Other or None	--	Q	--	--	--	Q	--	--	Q
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	3.63	5.26	5.64	--	339	430	499	3.36
1,000 to 1,999	--	3.56	5.22	5.61	--	480	569	714	2.95
2,000 or More	--	3.50	5.16	5.53	--	564	744	796	2.38
Air Conditioning									
Yes	2.52	3.48	5.15	5.46	394	441	563	641	2.66
No	2.65	3.67	5.28	5.80	410	494	589	693	2.32
Main Water Heating Fuel									
Electricity	2.60	3.88	5.33	5.82	427	389	491	598	5.23
Natural Gas	2.56	3.53	5.20	5.57	399	467	581	666	2.13
Fuel Oil/Kerosene	Q	--	--	--	Q	--	--	--	Q
Other or None	Q	--	--	Q	Q	--	--	Q	Q
Ownership Status									
Own	2.52	3.50	5.15	5.55	419	498	623	717	2.20
Rent	2.71	3.70	5.33	5.68	351	388	488	563	2.90
Annual Family Income									
Under $10,000	2.57	3.60	5.19	5.57	359	434	512	657	3.48
$10,000 to $19,999	2.61	3.55	5.34	5.58	389	420	565	585	2.80
$20,000 to $29,999	2.50	3.52	5.24	5.65	415	486	585	641	2.83
$30,000 or More	2.58	3.53	5.08	5.57	497	552	649	752	2.64
Number of People in Household									
Single Person	2.67	3.58	5.30	5.57	301	356	458	554	3.64
2 to 4 People	2.58	3.57	5.19	5.59	402	463	589	673	2.25
5 or More People	2.47	3.49	5.17	5.64	493	586	713	879	2.80
Age of Household Head									
Less than 25 Years	2.70	3.69	5.32	5.77	355	357	461	487	3.98
25 to 59 Years	2.56	3.56	5.21	5.64	423	491	591	690	1.96
60 Years or Older	2.55	3.51	5.17	5.46	367	426	567	645	3.34

See footnotes at end of table.

Table 22. Average Residential Prices and Expenditures for Natural Gas, 1978 Through 1984 (Continued)

South

Household Characteristics	Fuel Price (Dollars per Million Btu)				Expenditures (Dollars per Household)				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	0.89	0.75	0.72	0.66	1.59	1.15	1.32	1.31	
All Households	$2.85	$3.84	$5.62	$5.81	$249	$322	$436	$466	3.59
Census Division									
South Atlantic	--	4.48	6.48	6.68	--	383	501	567	4.24
East South Central	--	3.57	5.32	5.13	--	302	397	409	6.25
West South Central	--	3.41	5.06	5.22	--	280	401	400	5.88
Weather Zone									
Fewer than 2,000 CDD and--									
5,500 to 7,000 HDD	Q	--	--	--	Q	--	--	--	Q
4,000 to 5,499 HDD	3.77	4.20	6.28	6.23	467	422	549	648	4.21
Fewer than 4,000 HDD	3.01	3.58	5.07	5.43	275	322	423	455	6.16
More than 2,000 CDD and Fewer than 4,000 HDD	2.69	3.88	5.75	5.86	208	277	394	377	5.04
Year of Construction									
Before 1950	2.79	4.00	5.78	5.86	257	353	454	499	3.83
1950 to 1974	2.91	3.73	5.54	5.83	246	310	437	458	4.28
After 1974	2.70	3.98	5.62	5.38	217	283	388	408	D
Main Space Heating Fuel									
Electricity	3.69	4.39	6.13	7.10	139	141	298	219	11.47
Natural Gas	2.82	3.80	5.58	5.75	259	342	451	483	3.60
Fuel Oil/Kerosene	Q	5.80	7.66	8.24	Q	161	204	274	9.12
Wood	2.85	4.41	6.12	6.25	201	197	329	401	12.50
Other or None	Q	--	--	Q	Q	--	--	Q	Q
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	3.96	5.84	5.83	--	242	330	364	3.60
1,000 to 1,999	--	3.86	5.47	5.70	--	340	440	466	3.85
2,000 or More	--	3.67	5.67	5.97	--	437	661	654	5.26
Air Conditioning									
Yes	2.90	3.86	5.63	5.86	253	321	443	467	3.45
No	2.70	3.76	5.59	5.62	237	322	411	465	6.31
Main Water Heating Fuel									
Electricity	3.11	4.26	6.19	6.34	253	266	405	398	4.87
Natural Gas	2.81	3.78	5.54	5.72	250	334	445	482	3.91
Fuel Oil/Kerosene	--	Q	Q	Q	--	Q	175	Q	52.85
Other or None	3.00	3.97	--	Q	160	401	--	Q	16.93
Ownership Status									
Own	2.81	3.80	5.56	5.81	273	352	472	502	4.01
Rent	2.94	3.96	5.77	5.79	203	255	373	405	3.82
Annual Family Income									
Under $10,000	2.69	3.98	5.92	5.71	202	282	378	409	3.99
$10,000 to $19,999	2.90	3.85	5.45	5.76	245	303	436	439	4.26
$20,000 to $29,999	2.98	3.84	5.52	5.84	310	370	436	423	4.56
$30,000 or More	3.02	3.66	5.57	5.89	423	374	513	561	5.89
Number of People in Household									
Single Person	2.84	4.08	5.93	5.74	183	249	345	387	5.09
2 to 4 People	2.83	3.80	5.61	5.83	251	327	452	469	3.56
5 or More People	2.93	3.79	5.35	5.75	321	409	526	591	4.82
Age of Household Head									
Less than 25 Years	3.02	3.56	5.34	5.52	180	235	280	370	6.79
25 to 59 Years	2.87	3.83	5.61	5.85	264	338	453	474	3.64
60 Years or Older	2.76	3.94	5.71	5.77	236	311	443	473	4.86

See footnotes at end of table.

Table 22. Average Residential Prices and Expenditures for Natural Gas, 1978 Through 1984 (Continued)

West

Household Characteristics	Fuel Price (Dollars per Million Btu)				Expenditures (Dollars per Household)				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	0.89	0.75	0.72	0.66	1.59	1.15	1.32	1.31	
All Households	$2.30	$3.50	$4.85	$5.55	$215	$261	$361	$406	2.17
Census Division									
Mountain	--	3.31	4.79	5.08	--	324	440	483	2.38
Pacific	--	3.59	4.88	5.80	--	240	335	377	2.21
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	Q	3.20	4.26	4.08	Q	389	507	471	3.10
5,500 to 7,000 HDD	2.30	3.00	4.53	5.24	273	351	480	605	6.40
4,000 to 5,499 HDD	Q	4.51	5.73	6.08	Q	382	390	471	12.14
Fewer than 4,000 HDD	2.22	3.44	4.85	5.91	188	221	331	361	2.19
More than 2,000 CDD and Fewer than 4,000 HDD	--	4.12	6.03	6.67	--	187	280	339	6.39
Year of Construction									
Before 1950	2.31	3.57	5.01	5.64	228	265	377	419	Q
1950 to 1974	2.27	3.50	4.85	5.63	202	255	366	421	2.73
After 1974	2.53	3.36	4.57	5.10	319	275	317	341	D
Main Space Heating Fuel									
Electricity	2.18	3.71	5.03	5.75	131	118	326	176	9.68
Natural Gas	2.30	3.49	4.83	5.54	220	269	365	429	2.15
Fuel Oil/Kerosene	--	Q	Q	5.59	--	Q	Q	148	35.37
Wood	Q	3.88	5.78	5.64	Q	221	310	285	11.87
Other or None	2.52	3.33	Q	5.58	135	178	Q	Q	13.53
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	3.53	4.84	5.50	--	202	269	292	2.60
1,000 to 1,999	--	3.48	4.83	5.46	--	267	378	421	1.98
2,000 or More	--	3.49	4.92	5.78	--	353	548	659	3.62
Air Conditioning									
Yes	2.32	3.48	4.92	5.82	237	239	359	412	3.39
No	2.28	3.51	4.82	5.38	204	274	363	402	2.72
Main Water Heating Fuel									
Electricity	2.78	4.93	6.20	6.34	256	315	435	478	7.42
Natural Gas	2.25	3.43	4.78	5.50	212	258	357	405	2.16
Fuel Oil/Kerosene	--	--	--	Q	--	--	--	Q	Q
Other or None	--	Q	Q	4.93	--	Q	Q	227	10.54
Ownership Status									
Own	2.14	3.49	4.83	5.56	238	290	411	483	2.49
Rent	2.54	3.52	4.89	5.51	190	208	293	301	2.86
Annual Family Income									
Under $10,000	2.48	3.53	4.90	5.51	210	240	316	383	3.40
$10,000 to $19,999	2.33	3.47	4.80	5.53	210	245	331	360	3.25
$20,000 to $29,999	2.18	3.47	4.82	5.53	223	282	352	356	3.01
$30,000 or More	2.09	3.52	4.88	5.57	228	288	438	479	3.62
Number of People in Household									
Single Person	2.50	3.58	4.90	5.49	167	194	271	268	3.23
2 to 4 People	2.29	3.50	4.85	5.47	228	269	374	411	2.20
5 or More People	2.03	3.43	4.80	5.81	277	323	499	581	4.79

See footnotes at end of table.

Table 22. Average Residential Prices and Expenditures for Natural Gas, 1978 Through 1984 (Continued)

West

Household Characteristics	Fuel Price (Dollars per Million Btu)				Expenditures (Dollars per Household)				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	0.89	0.75	0.72	0.66	1.59	1.15	1.32	1.31	
Age of Household Head									
Less than 25 Years	2.70	3.47	4.68	5.46	185	228	264	384	4.56
25 to 59 Years	2.25	3.48	4.85	5.55	230	265	376	412	2.53
60 Years or Older	2.29	3.55	4.91	5.56	197	260	355	393	2.93

-- Data not applicable or not available.
[D] The RSEs calculated using the row and column factors are unreliable. Reliable RSE estimates for each cell are found in Appendix A.
[Q] Data withheld due to large variance (1.96 * standard error > value).
Note: To obtain a Relative Standard Error Percent (RSE) for any table cell, multiply the cell's corresponding column and row factors.
See Glossary for definition of terms used in this report.
Data may not sum to totals because of rounding.
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

Detailed Statistics

Table 23. Counts of U.S. Households Using Natural Gas, 1978 Through 1984

United States

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.48	1.01	1.09	0.97	1.16	0.79	0.87	0.80	
All Households	49.0	51.6	54.2	55.4	100.0%	100.0%	100.0%	100.0%	B
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	3.2	4.4	4.7	5.2	6.5	8.6	8.6	9.3	16.85
5,500 to 7,000 HDD	15.7	15.0	15.2	16.0	32.1	29.0	28.1	28.9	7.92
4,000 to 5,499 HDD	13.6	12.8	14.0	14.6	27.8	24.7	25.8	26.3	9.48
Fewer than 4,000 HDD	9.8	13.1	13.4	13.3	20.0	25.3	24.7	23.9	7.81
More than 2,000 CDD and Fewer than 4,000 HDD	6.6	6.4	6.9	6.4	13.5	12.3	12.7	11.6	10.85
Year of Construction									
Before 1950	24.2	22.1	22.1	23.9	49.4	42.9	40.9	43.1	4.43
1950 to 1974	22.6	25.5	26.7	25.0	46.2	49.3	49.2	45.1	4.50
After 1974	2.2	4.0	5.3	6.5	4.4	7.8	9.9	11.7	D
Main Space Heating Fuel									
Electricity	1.2	1.7	1.5	1.2	2.5	3.2	2.7	2.2	17.41
Natural Gas	41.8	44.6	47.5	47.8	85.4	86.3	87.7	86.3	2.05
Fuel Oil/Kerosene	5.5	4.8	4.3	4.8	11.3	9.2	8.0	8.7	9.35
Wood	.2	.5	.7	1.2	.3	.9	1.3	2.2	20.72
Other or None	.2	.2	.1	.3	.5	.3	.3	.6	34.23
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	18.4	19.9	20.3	--	35.6	36.7	36.6	4.18
1,000 to 1,999	--	21.5	22.4	22.4	--	41.6	41.4	40.4	3.43
2,000 or More	--	11.8	11.9	12.8	--	22.9	21.9	23.0	5.06
Air Conditioning									
Yes	27.9	30.0	31.6	33.2	57.0	58.1	58.3	59.9	3.41
No	21.1	21.6	22.6	22.2	43.0	41.9	41.7	40.1	4.60
Main Water Heating Fuel									
Electricity	3.8	3.9	4.4	5.4	7.8	7.6	8.1	9.8	10.39
Natural Gas	41.6	44.1	47.1	46.9	85.0	85.5	86.9	84.6	2.06
Fuel Oil/Kerosene	3.3	3.5	2.7	2.8	6.8	6.7	4.9	5.1	12.54
LPG	Q	--	--	--	Q	--	--	--	Q
Other or None	.2	.1	Q	.3	.3	.2	Q	.5	38.68
Ownership Status									
Own	30.3	33.0	33.2	34.0	61.8	64.0	61.2	61.3	3.21
Rent	18.7	18.6	21.0	21.4	38.2	36.0	38.8	38.7	4.36
Annual Family Income									
Under $10,000	17.1	15.6	15.4	13.0	35.0	30.2	28.4	23.5	4.83
$10,000 to $19,999	16.1	16.0	13.2	14.3	32.8	31.0	24.4	25.8	4.38
$20,000 to $29,999	10.3	10.9	12.2	11.0	20.9	21.0	22.5	19.9	4.84
$30,000 or More	5.5	9.2	13.4	17.1	11.3	17.9	24.7	30.9	5.71
Number of People in Household									
Single Person	9.9	10.3	13.3	13.6	20.2	20.0	24.6	24.6	4.88
2 to 4 People	32.2	34.5	34.3	35.0	65.7	66.8	63.3	63.1	2.21
5 or More People	6.9	6.8	6.5	6.8	14.0	13.2	12.1	12.3	6.25
Age of Household Head									
Less than 25 Years	4.4	4.0	4.1	4.0	9.0	7.7	7.6	7.2	8.63
25 to 59 Years	30.8	33.7	34.3	35.6	62.8	65.2	63.3	64.3	2.51
60 Years or Older	13.8	14.0	15.7	15.8	28.2	27.1	29.1	28.6	4.66

See footnotes at end of table.

Table 23. Counts of U.S. Households Using Natural Gas, 1978 Through 1984 (Continued)

Northeast

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.48	1.01	1.09	0.97	1.16	0.79	0.87	0.80	
All Households	11.7	10.9	11.6	11.7	100.0%	100.0%	100.0%	100.0%	B
Census Division									
New England	--	1.9	2.0	2.0	--	17.0	17.6	17.2	15.45
Middle Atlantic	--	9.0	9.6	9.7	--	83.0	82.4	82.8	5.70
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	Q	.1	.2	Q	Q	1.3	1.3	Q	46.93
5,500 to 7,000 HDD	4.3	4.7	5.0	5.0	36.4	42.8	43.3	42.5	17.10
4,000 to 5,499 HDD	6.4	6.1	6.5	6.4	55.0	55.9	55.4	54.6	10.37
Year of Construction									
Before 1950	7.5	6.9	7.0	7.8	63.7	63.6	59.7	66.0	6.96
1950 to 1974	3.9	3.7	4.3	3.6	33.0	33.6	36.9	30.2	11.94
After 1974	Q	.3	.4	.4	Q	2.8	3.4	3.7	D
Main Space Heating Fuel									
Electricity	Q	Q	Q	Q	Q	Q	Q	Q	Q
Natural Gas	7.0	6.6	7.5	7.2	59.5	60.9	64.8	61.1	8.82
Fuel Oil/Kerosene	4.7	4.2	3.8	4.3	40.0	38.1	32.7	36.7	10.70
Wood	--	Q	.1	.1	--	Q	1.1	1.2	53.06
Other or None	--	Q	Q	.1	--	Q	Q	.7	53.14
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	4.5	4.3	4.2	--	41.4	36.7	35.6	7.71
1,000 to 1,999	--	3.9	4.6	4.3	--	35.4	39.1	37.0	9.01
2,000 or More	--	2.5	2.8	3.2	--	23.2	24.2	27.4	11.93
Air Conditioning									
Yes	5.7	5.6	6.3	6.4	49.1	51.5	54.5	54.4	7.30
No	6.0	5.3	5.3	5.4	50.9	48.5	45.5	45.6	7.92
Main Water Heating Fuel									
Electricity	Q	.4	.5	.5	Q	3.6	4.0	4.3	31.20
Natural Gas	7.9	7.2	8.7	8.5	67.6	66.3	74.5	72.0	6.95
Fuel Oil/Kerosene	3.3	3.3	2.5	2.8	28.0	30.1	21.4	23.6	12.44
LPG	Q	--	--	--	Q	--	--	--	Q
Other or None	--	Q	Q	Q	--	Q	Q	Q	Q
Ownership Status									
Own	6.1	6.0	6.8	7.1	52.2	54.8	58.3	60.5	6.96
Rent	5.6	4.9	4.9	4.6	47.8	45.2	41.7	39.5	7.43
Annual Family Income									
Under $10,000	4.3	3.4	3.2	2.6	36.4	31.1	27.3	22.0	9.02
$10,000 to $19,999	3.6	3.7	3.0	2.8	31.1	34.0	25.4	24.1	8.44
$20,000 to $29,999	2.6	2.3	2.7	2.4	22.2	20.8	23.2	20.5	10.71
$30,000 or More	1.2	1.5	2.8	3.9	10.3	14.1	24.0	33.4	11.67
Number of People in Household									
Single Person	2.4	2.5	3.0	2.7	20.4	23.0	25.9	22.9	10.66
2 to 4 People	7.5	7.0	7.3	7.8	64.4	63.9	62.9	66.4	5.15
5 or More People	1.8	1.4	1.3	1.2	15.2	13.1	11.3	10.6	10.25
Age of Household Head									
Less than 25 Years	.8	.6	.7	.6	7.2	5.4	5.8	5.1	20.75
25 to 59 Years	7.8	7.2	6.9	7.2	66.5	66.0	59.4	61.1	5.43
60 Years or Older	3.1	3.1	4.1	4.0	26.3	28.6	34.8	33.9	9.14

See footnotes at end of table.

Table 23. Counts of U.S. Households Using Natural Gas, 1978 Through 1984 (Continued)

North Central

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.48	1.01	1.09	0.97	1.16	0.79	0.87	0.80	
All Households	16.2	15.5	16.0	16.9	100.0%	100.0%	100.0%	100.0%	B
Census Division									
East North Central	--	10.9	11.1	11.9	--	70.4	69.7	70.3	4.25
West North Central	--	4.6	4.8	5.0	--	29.6	30.3	29.7	9.70
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	2.0	3.1	3.4	3.4	12.6	20.2	21.4	20.4	19.31
5,500 to 7,000 HDD	8.0	9.6	9.4	10.0	49.3	61.5	58.7	59.3	9.04
4,000 to 5,499 HDD	6.2	2.8	3.2	3.4	38.1	18.2	19.9	20.3	22.13
Year of Construction									
Before 1950	8.3	7.3	7.6	8.0	50.9	47.1	47.4	47.7	8.65
1950 to 1974	7.0	7.2	7.0	6.3	43.3	46.4	43.9	37.2	8.74
After 1974	.9	1.0	1.4	2.5	5.7	6.4	8.7	15.1	D
Main Space Heating Fuel									
Electricity	.1	.3	Q	.1	.8	2.0	Q	.5	43.46
Natural Gas	15.3	15.0	15.5	16.4	94.4	96.5	96.9	97.3	1.97
Fuel Oil/Kerosene	.7	.1	.2	.1	4.5	.6	1.1	.7	36.72
Wood	Q	Q	.2	.3	Q	Q	.9	1.6	45.23
Other or None	--	Q	--	--	--	Q	--	--	Q
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	4.8	5.4	6.1	--	31.2	33.8	36.4	7.40
1,000 to 1,999	--	6.1	5.9	5.8	--	39.1	36.7	34.3	6.20
2,000 or More	--	4.6	4.7	4.9	--	29.7	29.6	29.3	7.73
Air Conditioning									
Yes	10.5	9.7	9.2	10.7	65.0	62.2	57.7	63.2	5.56
No	5.7	5.9	6.8	6.2	35.0	37.8	42.3	36.8	8.66
Main Water Heating Fuel									
Electricity	.8	1.2	1.3	1.6	5.0	7.5	8.2	9.5	14.76
Natural Gas	15.4	14.4	14.7	15.2	94.7	92.5	91.8	90.3	2.26
Fuel Oil/Kerosene	Q	--	--	--	Q	--	--	--	Q
Other or None	Q	--	--	Q	Q	--	--	Q	Q
Ownership Status									
Own	11.7	10.3	10.2	10.6	72.0	66.2	63.7	62.9	5.02
Rent	4.5	5.3	5.8	6.3	28.0	33.8	36.3	37.1	8.30
Annual Family Income									
Under $10,000	4.8	4.5	4.7	4.6	29.8	29.2	29.7	27.6	8.85
$10,000 to $19,999	5.5	4.8	4.1	4.2	34.0	30.8	25.6	24.8	7.47
$20,000 to $29,999	3.8	3.7	3.3	3.7	23.7	23.6	20.4	22.2	7.53
$30,000 or More	2.0	2.5	3.9	4.3	12.5	16.3	24.3	25.4	11.24
Number of People in Household									
Single Person	2.6	2.7	3.9	5.1	15.8	17.5	24.1	30.4	8.89
2 to 4 People	11.3	10.7	10.0	9.9	69.5	68.6	62.7	58.6	4.14
5 or More People	2.4	2.2	2.1	1.9	14.8	13.9	13.2	11.0	10.95
Age of Household Head									
Less than 25 Years	1.5	1.4	1.3	1.3	9.2	9.0	8.0	8.0	15.37
25 to 59 Years	9.8	9.8	10.1	10.4	60.7	63.4	63.1	61.5	4.00
60 Years or Older	4.9	4.3	4.6	5.1	30.1	27.6	28.9	30.5	8.55

See footnotes at end of table.

Table 23. Counts of U.S. Households Using Natural Gas, 1978 Through 1984 (Continued)

South

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.48	1.01	1.09	0.97	1.16	0.79	0.87	0.80	
All Households	11.0	13.3	14.5	14.3	100.0%	100.0%	100.0%	100.0%	B
Census Division									
South Atlantic	--	4.9	5.3	5.6	--	36.7	36.5	38.8	10.08
East South Central	--	2.3	2.6	2.4	--	17.6	18.1	16.9	13.02
West South Central	--	6.1	6.6	6.3	--	45.7	45.4	44.3	6.06
Weather Zone									
Fewer than 2,000 CDD and--									
5,500 to 7,000 HDD	Q	--	--	--	Q	--	--	--	Q
4,000 to 5,499 HDD	.6	2.6	3.1	3.2	5.1	19.8	21.0	22.5	22.52
Fewer than 4,000 HDD	3.2	4.7	5.1	5.2	29.4	35.7	35.0	36.1	17.32
More than 2,000 CDD and Fewer than 4,000 HDD	6.6	5.9	6.4	5.9	60.2	44.5	44.0	41.4	11.23
Year of Construction									
Before 1950	4.6	4.4	4.3	4.5	42.3	32.7	29.5	31.1	10.00
1950 to 1974	5.8	7.9	8.7	8.6	52.6	59.5	59.5	60.3	7.38
After 1974	.6	1.0	1.6	1.2	5.1	7.7	10.9	8.6	D
Main Space Heating Fuel									
Electricity	.7	.8	.6	.5	6.4	6.1	4.4	3.6	26.37
Natural Gas	10.0	11.8	13.3	13.1	91.2	89.0	91.6	91.5	3.99
Fuel Oil/Kerosene	Q	.5	.3	.3	Q	3.6	2.4	2.2	24.97
Wood	.1	.2	.2	.4	Q	1.3	1.6	2.5	41.53
Other or None	Q	--	--	Q	Q	--	--	Q	Q
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	4.7	5.4	5.0	--	35.6	37.3	34.8	8.50
1,000 to 1,999	--	6.3	6.7	6.6	--	47.2	45.8	46.0	7.06
2,000 or More	--	2.3	2.5	2.7	--	17.2	16.9	19.1	12.59
Air Conditioning									
Yes	8.1	10.2	11.8	11.4	73.9	76.9	80.8	79.2	5.50
No	2.9	3.1	2.8	3.0	26.1	23.1	19.2	20.8	14.85
Main Water Heating Fuel									
Electricity	1.6	1.8	2.0	2.6	14.9	13.2	13.6	18.0	16.97
Natural Gas	9.2	11.3	12.4	11.7	83.7	84.9	85.3	81.4	4.90
Fuel Oil/Kerosene	--	Q	Q	Q	--	Q	Q	Q	Q
Other or None	.1	.1	--	Q	1.4	.5	--	Q	43.06
Ownership Status									
Own	7.2	9.2	9.3	9.1	65.5	68.8	63.7	63.6	7.07
Rent	3.8	4.1	5.3	5.2	34.5	31.2	36.3	36.4	10.34
Annual Family Income									
Under $10,000	4.8	4.4	4.5	3.6	43.4	33.1	31.0	25.2	9.90
$10,000 to $19,999	3.9	4.0	3.1	4.0	35.1	29.8	21.3	28.1	8.33
$20,000 to $29,999	1.5	2.5	3.5	2.3	14.1	18.5	23.9	15.8	12.42
$30,000 or More	.8	2.5	3.5	4.4	7.4	18.6	23.8	30.9	12.65
Number of People in Household									
Single Person	2.0	2.7	3.4	3.0	18.4	20.3	23.1	21.0	11.06
2 to 4 People	7.3	8.9	9.3	9.6	66.8	66.8	64.1	66.7	4.46
5 or More People	1.6	1.7	1.9	1.8	14.8	12.9	12.8	12.3	12.06
Age of Household Head									
Less than 25 Years	1.0	1.1	1.1	1.0	9.2	8.5	7.9	7.3	17.45
25 to 59 Years	7.1	8.4	9.5	9.5	64.4	63.2	65.5	66.2	5.28
60 Years or Older	2.9	3.8	3.9	3.8	26.4	28.3	26.6	26.5	9.40

See footnotes at end of table.

Table 23. Counts of U.S. Households Using Natural Gas, 1978 Through 1984 (Continued)

West

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.48	1.01	1.09	0.97	1.16	0.79	0.87	0.80	
All Households	10.1	11.9	12.0	12.5	100.0%	100.0%	100.0%	100.0%	B
Census Division									
Mountain	--	3.0	2.9	3.4	--	24.9	24.5	26.9	9.27
Pacific	--	8.9	9.0	9.1	--	75.1	75.5	73.1	4.20
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	Q	1.2	1.1	1.4	Q	9.7	9.1	11.1	15.61
5,500 to 7,000 HDD	2.9	.8	.8	1.0	28.8	6.5	6.7	8.1	13.91
4,000 to 5,499 HDD	Q	1.2	1.3	1.5	Q	10.1	10.9	12.1	45.35
Fewer than 4,000 HDD	6.6	8.3	8.3	8.1	65.1	70.0	69.1	64.7	6.48
More than 2,000 CDD and Fewer than 4,000 HDD	--	.4	.5	.5	--	3.6	4.2	3.9	11.01
Year of Construction									
Before 1950	3.8	3.5	3.3	3.6	38.0	29.7	27.7	29.2	8.52
1950 to 1974	6.0	6.7	6.7	6.6	59.2	56.1	55.8	52.5	7.42
After 1974	Q	1.7	2.0	2.3	Q	14.2	16.5	18.3	D
Main Space Heating Fuel									
Electricity	Q	.5	.6	.6	Q	4.2	4.6	4.9	27.32
Natural Gas	9.6	11.1	11.1	11.2	94.9	93.4	92.9	89.4	2.88
Fuel Oil/Kerosene	--	Q	Q	.1	--	Q	Q	.4	68.56
Wood	Q	.2	.2	.4	Q	1.3	1.8	3.6	36.55
Other or None	.2	.1	Q	.2	1.7	.7	Q	1.6	43.65
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	4.3	4.8	4.9	--	35.9	39.8	39.6	7.73
1,000 to 1,999	--	5.3	5.4	5.7	--	44.1	44.7	45.4	5.89
2,000 or More	--	2.4	1.9	1.9	--	20.0	15.5	15.0	12.63
Air Conditioning									
Yes	3.5	4.5	4.3	4.8	34.9	37.9	35.7	38.4	12.58
No	6.6	7.4	7.7	7.7	65.1	62.1	64.3	61.6	7.82
Main Water Heating Fuel									
Electricity	.9	.6	.6	.7	8.9	5.3	5.2	5.9	20.82
Natural Gas	9.2	11.3	11.3	11.5	91.1	94.6	94.6	92.4	2.69
Fuel Oil/Kerosene	--	--	--	Q	--	--	--	Q	Q
Other or None	--	Q	Q	.2	--	Q	Q	1.6	77.03
Ownership Status									
Own	5.3	7.6	6.9	7.2	52.4	64.1	57.7	57.3	6.14
Rent	4.8	4.3	5.1	5.3	47.6	35.9	42.3	42.7	7.73
Annual Family Income									
Under $10,000	3.3	3.2	2.9	2.2	32.3	27.2	24.5	17.3	9.31
$10,000 to $19,999	3.1	3.5	3.1	3.2	30.4	29.6	25.5	25.9	8.38
$20,000 to $29,999	2.3	2.5	2.7	2.6	22.5	20.7	22.9	20.9	8.12
$30,000 or More	1.5	2.7	3.2	4.5	14.8	22.5	27.1	35.8	10.66
Number of People in Household									
Single Person	2.9	2.4	3.1	2.8	29.2	20.1	25.7	22.4	8.12
2 to 4 People	6.1	8.0	7.6	7.7	60.1	67.1	63.8	61.9	4.07
5 or More People	1.1	1.5	1.3	2.0	10.7	12.8	10.6	15.8	13.89

See footnotes at end of table.

Table 23. Counts of U.S. Households Using Natural Gas, 1978 Through 1984 (Continued)

West

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.48	1.01	1.09	0.97	1.16	0.79	0.87	0.80	
Age of Household Head									
Less than 25 Years	1.1	0.8	1.0	1.0	10.6	7.1	8.5	8.0	17.90
25 to 59 Years	6.1	8.2	7.8	8.6	60.2	69.2	64.8	68.8	4.70
60 Years or Older	2.9	2.8	3.2	2.9	29.2	23.7	26.7	23.3	9.00

— Data not applicable or not available.

[B] The RSEs for Percent of Households values given in this row are 0.0. The RSE Row Factor for Millions of Households values is 2.57 for United States totals, 6.10 for Northeast Census Region totals, 3.64 for North Central Census Region totals, 6.22 for South Census Region totals and 4.11 for West Census Region totals.

[D] The RSEs calculated using the row and column factors are unreliable. Reliable RSE estimates for each cell are found in Appendix A.

[Q] Data withheld due to large variance (1.96 * standard error > value).

Note: To obtain a Relative Standard Error Percent (RSE) for any table cell, multiply the cell's corresponding column and row factors.
See Glossary for definition of terms used in this report.
Data may not sum to totals because of rounding.
Percentages are calculated on unrounded numbers.

Source: *Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.*

Table 24. Average Residential Consumption for Fuel Oil/Kerosene, 1978 Through 1984

United States

Household Characteristics	Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	0.98	0.82	1.08	1.14	
All Households	127.3	100.8	73.4	71.9	2.82
Weather Zone					
Fewer than 2,000 CDD and--					
More than 7,000 HDD	162.0	86.3	73.9	80.5	7.16
5,500 to 7,000 HDD	142.3	113.3	87.2	85.3	4.73
4,000 to 5,499 HDD	136.1	106.8	76.6	80.2	4.16
Fewer than 4,000 HDD	75.6	75.8	39.3	26.7	11.38
More than 2,000 CDD and Fewer than 4,000 HDD	33.6	45.7	16.0	17.4	16.09
Year of Construction					
Before 1950	142.3	108.1	85.8	88.0	3.38
1950 to 1974	107.1	95.7	60.9	58.7	4.78
After 1974	114.9	66.4	57.9	46.7	D
Main Space Heating Fuel					
Electricity	Q	19.2	10.1	6.6	27.14
Natural Gas	Q	19.1	12.4	11.4	19.85
Fuel Oil/Kerosene	129.0	112.4	89.7	94.7	2.5
LPG	--	Q	Q	Q	Q
Wood	Q	25.5	26.7	39.1	12.1
Other or None	--	39.3	19.6	21.4	30.57
Measured Heated Area of Residence (square feet)					
Less than 1,000	--	92.5	64.9	62.1	4.04
1,000 to 1,999	--	94.8	73.3	67.6	3.65
2,000 or More	--	119.7	83.6	92.7	5.21
Air Conditioning					
Yes	126.4	103.0	68.2	63.9	4.01
No	128.2	98.8	78.9	80.7	3.57
Main Water Heating Fuel					
Electricity	98.3	73.4	53.9	51.0	4.84
Natural Gas	139.7	86.1	64.1	61.6	7.38
Fuel Oil/Kerosene	163.6	131.2	101.6	109.2	2.75
LPG	133.6	61.2	63.8	71.3	17.09
Other or None	56.2	58.6	58.6	25.6	29.92
Ownership Status					
Own	127.9	101.0	73.0	73.5	3.42
Rent	125.9	100.5	74.5	68.5	4.26
Annual Family Income					
Under $10,000	117.9	102.4	77.8	73.7	5.03
$10,000 to $19,999	121.1	93.0	73.2	68.5	4.62
$20,000 to $29,999	136.6	98.9	67.3	72.7	5.45
$30,000 or More	153.0	116.9	74.7	72.9	6.18
Number of People in Household					
Single Person	116.9	104.0	82.2	76.6	5.61
2 to 4 People	125.4	98.3	72.1	69.9	3.38
5 or More People	149.8	109.4	66.8	75.4	7.13
Age of Household Head					
Less than 25 Years	115.8	94.2	66.8	64.7	10.62
25 to 59 Years	130.8	96.6	67.5	66.0	3.92
60 Years or Older	122.5	110.1	85.0	84.9	3.58

See footnotes at end of table.

Table 24. Average Residential Consumption for Fuel Oil/Kerosene, 1978 Through 1984 (Continued)

Northeast

Household Characteristics	Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	0.98	0.82	1.08	1.14	
All Households	149.2	118.7	89.7	97.3	2.67
Census Division					
New England	—	118.2	96.5	108.8	3.08
Middle Atlantic	—	118.9	87.0	93.2	3.21
Weather Zone					
Fewer than 2,000 CDD and--					
More than 7,000 HDD	Q	99.7	75.6	90.3	8.98
5,500 to 7,000 HDD	154.1	121.2	95.3	105.1	5.02
4,000 to 5,499 HDD	145.2	121.9	89.0	93.3	3.52
Year of Construction					
Before 1950	151.7	122.7	95.9	107.6	3.85
1950 to 1974	147.3	116.5	80.1	86.1	4.89
After 1974	Q	76.3	89.3	73.7	D
Main Space Heating Fuel					
Electricity	Q	Q	12.3	11.5	36.23
Natural Gas	Q	13.8	14.4	3.0	27.72
Fuel Oil/Kerosene	149.8	129.9	100.7	107.9	2.38
LPG	—	—	Q	36.8	21.30
Wood	—	31.3	37.3	54.5	16.81
Other or None	—	53.4	17.0	Q	35.83
Measured Heated Area of Residence (square feet)					
Less than 1,000	—	109.3	79.7	82.8	3.34
1,000 to 1,999	—	112.5	92.8	94.3	3.26
2,000 or More	—	138.5	97.7	119.5	5.42
Air Conditioning					
Yes	156.5	120.1	85.4	95.8	3.54
No	142.4	117.4	94.0	98.7	3.91
Main Water Heating Fuel					
Electricity	121.2	91.3	68.0	71.1	7.07
Natural Gas	132.1	91.0	75.9	99.8	7.52
Fuel Oil/Kerosene	164.5	134.6	103.4	109.6	2.85
LPG	137.9	56.0	82.9	83.6	23.54
Other or None	—	39.8	Q	Q	34.53
Ownership Status					
Own	155.1	122.7	93.1	103.0	3.44
Rent	140.5	112.1	83.4	86.7	3.83
Annual Family Income					
Under $10,000	139.7	123.1	90.5	89.6	5.81
$10,000 to $19,999	146.6	108.9	87.4	97.3	4.56
$20,000 to $29,999	149.9	117.4	85.4	97.1	5.00
$30,000 or More	182.9	133.2	95.6	103.7	6.16
Number of People in Household					
Single Person	131.3	117.0	92.0	90.5	6.07
2 to 4 People	149.9	117.0	89.4	99.5	2.89
5 or More People	167.0	130.1	87.3	97.7	7.22
Age of Household Head					
Less than 25 Years	145.3	117.0	78.3	75.8	8.44
25 to 59 Years	152.2	114.0	84.4	95.7	3.39
60 Years or Older	142.6	127.9	100.6	103.7	4.20

See footnotes at end of table.

Table 24. Average Residential Consumption for Fuel Oil/Kerosene, 1978 Through 1984 (Continued)

North Central

Household Characteristics	Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	0.98	0.82	1.08	1.14	
All Households	146.1	77.0	64.3	49.1	7.86
Census Division					
East North Central	--	77.1	69.4	49.0	9.57
West North Central	--	76.9	45.6	49.5	13.36
Weather Zone					
Fewer than 2,000 CDD and--					
More than 7,000 HDD	182.1	73.0	72.8	70.7	12.26
5,500 to 7,000 HDD	142.5	84.5	58.6	36.3	13.48
4,000 to 5,499 HDD	117.4	Q	Q	33.6	19.07
Year of Construction					
Before 1950	152.5	82.9	79.9	53.5	10.75
1950 to 1974	130.6	66.8	44.6	42.5	10.56
After 1974	Q	79.8	53.4	47.7	D
Main Space Heating Fuel					
Electricity	Q	Q	13.8	6.6	21.50
Natural Gas	--	26.4	4.6	10.7	31.54
Fuel Oil/Kerosene	147.6	92.1	89.7	92.7	6.22
LPG	--	Q	Q	Q	Q
Wood	Q	27.1	Q	24.4	31.26
Other or None	--	Q	--	--	Q
Measured Heated Area of Residence (square feet)					
Less than 1,000	--	66.7	54.9	45.6	15.21
1,000 to 1,999	--	76.9	64.0	55.4	10.31
2,000 or More	--	83.0	70.2	42.7	15.26
Air Conditioning					
Yes	146.3	81.9	57.5	35.5	10.03
No	146.0	74.4	69.3	64.8	9.61
Main Water Heating Fuel					
Electricity	136.2	74.3	68.7	62.5	9.33
Natural Gas	158.2	62.1	41.7	18.6	21.40
Fuel Oil/Kerosene	Q	122.4	Q	Q	11.81
LPG	Q	62.7	Q	Q	50.71
Other or None	--	Q	Q	Q	Q
Ownership Status					
Own	152.1	73.1	63.4	46.7	10.33
Rent	116.0	93.2	68.9	55.9	14.94
Annual Family Income					
Under $10,000	130.5	81.0	78.0	66.8	9.46
$10,000 to $19,999	133.4	67.1	65.6	41.2	13.49
$20,000 to $29,999	160.0	69.9	49.0	55.6	12.25
$30,000 or More	173.8	103.1	67.8	38.5	14.96
Number of People in Household					
Single Person	118.6	85.2	80.1	61.7	11.69
2 to 4 People	149.6	77.2	64.8	46.1	10.81
5 or More People	159.6	69.9	40.8	34.6	20.37
Age of Household Head					
Less than 25 Years	131.6	Q	51.5	81.2	29.14
25 to 59 Years	159.2	73.1	58.8	34.4	11.58
60 Years or Older	126.5	86.6	73.7	76.3	8.99

See footnotes at end of table.

Table 24. Average Residential Consumption for Fuel Oil/Kerosene, 1978 Through 1984 (Continued)

South

Household Characteristics	Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	0.98	0.82	1.08	1.14	
All Households	73.8	74.7	45.0	35.0	9.44
Census Division					
South Atlantic	--	76.3	49.0	38.7	9.82
East South Central	--	41.1	21.4	19.9	24.35
West South Central	--	Q	Q	Q	Q
Weather Zone					
Fewer than 2,000 CDD and--					
5,500 to 7,000 HDD	Q	--	--	--	Q
4,000 to 5,499 HDD	110.4	79.8	57.1	55.2	14.89
Fewer than 4,000 HDD	75.6	75.8	39.3	26.3	11.51
More than 2,000 CDD and Fewer than 4,000 HDD	33.3	46.5	14.9	17.4	17.15
Year of Construction					
Before 1950	90.0	81.2	63.4	53.0	10.56
1950 to 1974	68.2	74.3	38.1	27.2	13.53
After 1974	79.4	52.1	15.6	13.1	D
Main Space Heating Fuel					
Electricity	Q	23.5	6.5	3.4	27.45
Natural Gas	Q	Q	Q	Q	Q
Fuel Oil/Kerosene	75.7	83.5	61.0	53.4	7.53
LPG	--	Q	Q	Q	Q
Wood	Q	8.6	13.7	Q	44.80
Other or None	--	--	Q	Q	Q
Measured Heated Area of Residence (square feet)					
Less than 1,000	--	62.7	35.7	29.4	14.46
1,000 to 1,999	--	72.3	45.5	36.0	11.80
2,000 or More	--	102.6	57.4	45.5	14.37
Air Conditioning					
Yes	75.9	78.4	42.9	29.0	10.32
No	68.6	68.2	48.9	46.2	12.42
Main Water Heating Fuel					
Electricity	65.3	62.9	36.0	28.6	8.40
Natural Gas	Q	84.7	41.0	33.3	22.51
Fuel Oil/Kerosene	140.3	108.9	92.9	96.4	15.56
LPG	80.9	62.7	Q	Q	31.40
Other or None	54.0	Q	Q	15.8	29.49
Ownership Status					
Own	75.2	74.3	42.6	36.0	9.76
Rent	64.9	75.3	51.7	33.0	17.24
Annual Family Income					
Under $10,000	61.7	73.7	49.1	53.1	12.46
$10,000 to $19,999	71.9	69.0	49.4	30.5	14.54
$20,000 to $29,999	88.4	73.4	39.0	17.0	20.48
$30,000 or More	88.9	90.2	39.6	27.5	17.38
Number of People in Household					
Single Person	76.4	81.2	57.0	55.4	17.85
2 to 4 People	71.8	71.3	43.4	30.5	10.75
5 or More People	85.6	87.8	37.4	27.3	19.78
Age of Household Head					
Less than 25 Years	53.2	Q	Q	37.4	38.90
25 to 59 Years	71.4	70.1	39.1	26.0	11.27
60 Years or Older	85.0	83.1	56.5	53.1	9.89

See footnotes at end of table.

Table 24. Average Residential Consumption for Fuel Oil/Kerosene, 1978 Through 1984 (Continued)

West

Household Characteristics	Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	0.98	0.82	1.08	1.14	
All Households	101.3	63.5	47.6	56.3	8.90
Census Division					
Mountain	--	Q	50.5	Q	44.79
Pacific	--	63.2	46.5	61.7	9.99
Weather Zone					
Fewer than 2,000 CDD and--					
More than 7,000 HDD	Q	Q	Q	Q	Q
5,500 to 7,000 HDD	88.1	65.5	Q	53.6	24.04
4,000 to 5,499 HDD	Q	60.2	45.3	61.5	9.88
Fewer than 4,000 HDD	--	Q	Q	Q	Q
More than 2,000 CDD and Fewer than 4,000 HDD	Q	Q	26.7	--	43.57
Year of Construction					
Before 1950	103.6	60.8	49.1	82.6	10.95
1950 to 1974	96.4	66.3	47.6	39.5	13.13
After 1974	--	--	Q	Q	D
Main Space Heating Fuel					
Electricity	Q	Q	Q	Q	Q
Natural Gas	--	Q	Q	Q	Q
Fuel Oil/Kerosene	105.6	69.2	61.5	80.2	7.21
LPG	--	Q	Q	--	Q
Wood	Q	Q	20.8	Q	43.97
Other or None	--	Q	26.7	Q	43.57
Measured Heated Area of Residence (square feet)					
Less than 1,000	--	39.8	44.3	39.9	20.80
1,000 to 1,999	--	75.3	40.0	49.4	17.16
2,000 or More	--	63.7	65.0	77.6	15.70
Air Conditioning					
Yes	119.4	64.0	46.5	56.9	20.07
No	97.2	63.3	47.9	56.2	9.81
Main Water Heating Fuel					
Electricity	100.6	59.8	50.2	72.0	8.44
Natural Gas	--	Q	Q	Q	Q
Fuel Oil/Kerosene	--	72.1	49.0	Q	38.15
LPG	Q	Q	Q	Q	Q
Other or None	Q	--	--	Q	Q
Ownership Status					
Own	109.7	64.1	46.5	52.5	11.54
Rent	77.1	61.3	51.9	69.8	20.07
Annual Family Income					
Under $10,000	114.6	53.2	62.6	77.7	18.77
$10,000 to $19,999	96.7	64.2	50.4	75.5	14.72
$20,000 to $29,999	86.2	53.2	41.4	51.2	12.81
$30,000 or More	82.3	81.5	42.4	34.2	19.30
Number of People in Household					
Single Person	98.3	70.3	52.6	73.5	15.57
2 to 4 People	102.8	62.4	49.4	59.7	9.69
5 or More People	93.7	59.7	35.0	Q	26.42

See footnotes at end of table.

Table 24. Average Residential Consumption for Fuel Oil/Kerosene, 1978 Through 1984 (Continued)

West

Household Characteristics	Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	0.98	0.82	1.08	1.14	
Age of Household Head					
Less than 25 Years	Q	Q	Q	Q	Q
25 to 59 Years	95.9	65.4	43.8	55.3	10.88
60 Years or Older	110.5	63.0	54.5	62.7	11.01

-- Data not applicable or not available.
D The RSEs calculated using the row and column factors are unreliable. Reliable RSE estimates for each cell are found in Appendix A.
Q Data withheld due to large variance (1.96 * standard error > value).
Note: To obtain a Relative Standard Error Percent (RSE) for any table cell, multiply the cell's corresponding column and row factors.
See Glossary for definition of terms used in this report.
Data may not sum to totals because of rounding.
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

Table 25. Average Residential Prices and Expenditures for Fuel Oil/Kerosene, 1978 Through 1984

United States

Household Characteristics	Fuel Price (Dollars per Million Btu)				Expenditures (Dollars per Household)				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	0.33	0.23	0.27	0.61	2.83	2.49	3.26	3.43	
All Households	$3.93	$8.04	$8.42	$7.64	$501	$811	$619	$550	0.97
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	3.85	7.99	8.32	7.76	624	689	615	624	3.06
5,500 to 7,000 HDD	3.91	8.02	8.42	7.82	557	908	734	667	1.59
4,000 to 5,499 HDD	3.97	8.04	8.44	7.38	541	860	647	592	1.21
Fewer than 4,000 HDD	3.84	8.16	8.53	8.46	291	619	335	226	2.91
More than 2,000 CDD and Fewer than 4,000 HDD	4.30	8.39	8.66	8.71	144	384	139	151	4.91
Year of Construction									
Before 1950	3.93	8.04	8.41	7.68	560	869	721	676	1.16
1950 to 1974	3.94	8.03	8.44	7.59	422	769	514	446	1.37
After 1974	3.91	8.05	8.42	7.55	450	534	488	353	D
Main Space Heating Fuel									
Electricity	4.09	7.97	8.61	9.29	Q	153	87	62	7.44
Natural Gas	Q	7.93	8.53	7.30	Q	152	106	83	4.59
Fuel Oil/Kerosene	3.93	8.05	8.42	7.62	508	905	754	722	.92
LPG	--	Q	Q	8.52	--	Q	Q	Q	12.25
Wood	Q	7.84	8.55	7.92	Q	200	228	310	3.47
Other or None	--	7.91	8.42	8.25	--	311	165	176	5.26
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	8.06	8.45	7.23	--	745	548	449	1.29
1,000 to 1,999	--	8.06	8.46	7.78	--	764	620	525	1.08
2,000 or More	--	8.01	8.35	7.86	--	959	698	729	1.60
Air Conditioning									
Yes	3.95	8.05	8.41	7.67	499	829	574	491	1.23
No	3.92	8.03	8.44	7.62	503	794	666	615	1.21
Main Water Heating Fuel									
Electricity	3.89	8.04	8.44	7.95	382	590	455	405	1.50
Natural Gas	3.90	8.07	8.42	7.76	546	695	539	478	2.30
Fuel Oil/Kerosene	3.98	8.03	8.42	7.37	651	1,054	856	806	1.01
LPG	3.97	8.05	8.42	7.84	530	492	537	559	5.72
Other or None	3.77	8.11	8.08	8.40	212	476	473	216	8.13
Ownership Status									
Own	3.93	8.04	8.42	7.84	503	812	615	577	1.12
Rent	3.94	8.04	8.43	7.20	496	808	627	493	1.15
Annual Family Income									
Under $10,000	3.92	8.05	8.43	7.61	462	824	656	561	1.61
$10,000 to $19,999	3.94	8.02	8.44	7.56	478	745	618	518	1.39
$20,000 to $29,999	3.95	8.07	8.39	7.71	539	797	565	560	1.71
$30,000 or More	3.93	8.05	8.43	7.69	601	941	629	561	1.82
Number of People in Household									
Single Person	3.91	8.07	8.43	7.46	457	839	693	571	1.82
2 to 4 People	3.94	8.03	8.41	7.69	494	789	606	537	1.07
5 or More People	3.95	8.05	8.49	7.76	591	881	567	585	2.22
Age of Household Head									
Less than 25 Years	3.95	8.00	8.46	7.51	458	754	565	486	2.73
25 to 59 Years	3.95	8.04	8.42	7.64	517	777	569	504	1.22
60 Years or Older	3.90	8.04	8.42	7.66	478	886	716	650	1.93

See footnotes at end of table.

Table 25. Average Residential Prices and Expenditures for Fuel Oil/Kerosene, 1978 Through 1984 (Continued)

Northeast

Household Characteristics	Fuel Price (Dollars per Million Btu)				Expenditures (Dollars per Household)				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	0.33	0.23	0.27	0.61	2.83	2.49	3.26	3.43	
All Households	$3.98	$8.04	$8.43	$7.54	$594	$955	$756	$734	0.98
Census Division									
New England	--	8.07	8.47	7.87	--	954	818	856	1.18
Middle Atlantic	--	8.03	8.41	7.41	--	955	731	690	1.19
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	Q	8.07	8.50	7.98	Q	804	643	720	2.82
5,500 to 7,000 HDD	3.97	8.03	8.42	7.80	611	973	802	820	1.81
4,000 to 5,499 HDD	3.99	8.05	8.42	7.25	580	981	749	677	1.20
Year of Construction									
Before 1950	3.98	8.05	8.41	7.57	604	988	806	814	1.30
1950 to 1974	3.99	8.03	8.47	7.47	588	935	679	643	1.35
After 1974	Q	8.08	8.38	7.67	Q	616	749	565	D
Main Space Heating Fuel									
Electricity	Q	Q	8.46	9.36	Q	Q	104	107	9.11
Natural Gas	Q	7.85	8.57	8.87	Q	108	123	26	5.80
Fuel Oil/Kerosene	3.98	8.05	8.42	7.52	597	1,045	848	811	.94
LPG	--	--	Q	8.18	--	--	Q	301	9.93
Wood	--	8.01	8.47	7.78	--	251	316	424	4.85
Other or None	--	7.94	8.41	Q	--	424	143	Q	7.49
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	8.05	8.43	7.05	--	879	671	583	1.05
1,000 to 1,999	--	8.05	8.44	7.70	--	906	784	726	1.06
2,000 or More	--	8.03	8.40	7.82	--	1,113	821	935	1.75
Air Conditioning									
Yes	3.99	8.04	8.41	7.59	624	966	719	727	1.13
No	3.98	8.05	8.44	7.50	566	945	793	740	1.35
Main Water Heating Fuel									
Electricity	3.96	8.08	8.48	7.89	480	738	576	561	2.01
Natural Gas	3.94	8.08	8.43	7.80	520	735	640	779	2.46
Fuel Oil/Kerosene	3.99	8.03	8.41	7.37	657	1,081	870	808	1.05
LPG	4.04	8.02	8.54	7.48	557	449	708	626	7.13
Other or None	--	8.22	8.34	Q	--	327	Q	Q	8.78
Ownership Status									
Own	3.99	8.05	8.43	7.77	619	987	785	800	1.22
Rent	3.97	8.03	8.41	7.03	557	900	702	610	.95
Annual Family Income									
Under $10,000	3.96	8.04	8.40	7.47	553	989	760	669	1.73
$10,000 to $19,999	3.97	8.03	8.45	7.40	582	874	739	720	1.45
$20,000 to $29,999	4.02	8.07	8.41	7.64	603	948	718	742	1.77
$30,000 or More	4.00	8.06	8.44	7.63	731	1,073	807	791	1.99
Number of People in Household									
Single Person	3.95	8.05	8.40	7.31	519	942	773	662	1.92
2 to 4 People	3.99	8.03	8.42	7.58	598	939	753	754	.96
5 or More People	3.99	8.10	8.49	7.72	667	1,054	741	754	2.51
Age of Household Head									
Less than 25 Years	3.97	8.01	8.44	7.27	577	937	661	551	2.40
25 to 59 Years	4.00	8.05	8.44	7.54	608	917	712	721	1.15
60 Years or Older	3.95	8.05	8.40	7.58	563	1,029	845	786	1.42

See footnotes at end of table.

Detailed Statistics

Table 25. Average Residential Prices and Expenditures for Fuel Oil/Kerosene, 1978 Through 1984 (Continued)

North Central

Household Characteristics	Fuel Price (Dollars per Million Btu)				Expenditures (Dollars per Household)				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	0.33	0.23	0.27	0.61	2.83	2.49	3.26	3.43	
All Households	$3.82	$7.92	$8.28	$7.67	$559	$610	$532	$376	2.80
Census Division									
East North Central	--	7.99	8.31	7.69	--	616	577	376	3.29
West North Central	--	7.72	8.08	7.62	--	594	368	377	4.85
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	3.75	7.87	8.15	7.44	683	575	594	526	4.87
5,500 to 7,000 HDD	3.86	7.99	8.47	7.98	550	676	496	290	3.75
4,000 to 5,499 HDD	3.84	Q	Q	7.83	451	Q	Q	263	7.46
Year of Construction									
Before 1950	3.84	7.95	8.25	7.86	585	659	659	420	3.39
1950 to 1974	3.79	7.87	8.23	7.80	495	526	367	331	3.40
After 1974	Q	7.95	8.51	7.10	Q	634	454	339	D
Main Space Heating Fuel									
Electricity	Q	Q	8.72	9.25	Q	Q	120	61	7.38
Natural Gas	--	8.07	8.63	7.76	--	213	40	83	6.49
Fuel Oil/Kerosene	3.82	7.95	8.25	7.60	564	732	740	704	2.62
LPG	--	Q	Q	Q	--	Q	Q	Q	Q
Wood	Q	7.57	Q	8.23	Q	205	Q	201	8.43
Other or None	--	Q	--	--	--	Q	--	--	Q
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	8.07	8.31	7.34	--	538	457	335	5.86
1,000 to 1,999	--	7.93	8.42	7.69	--	610	539	427	3.34
2,000 or More	--	7.84	8.07	7.98	--	651	567	341	4.87
Air Conditioning									
Yes	3.82	7.88	8.26	7.37	559	645	475	261	3.68
No	3.83	7.95	8.29	7.86	559	591	575	509	2.97
Main Water Heating Fuel									
Electricity	3.82	7.88	8.29	7.80	520	586	569	487	2.85
Natural Gas	3.83	8.20	8.16	7.79	606	509	341	145	7.09
Fuel Oil/Kerosene	Q	8.01	Q	Q	Q	980	Q	Q	3.84
LPG	Q	7.79	8.04	Q	Q	488	Q	Q	19.96
Other or None	--	Q	Q	Q	--	Q	Q	Q	Q
Ownership Status									
Own	3.83	7.91	8.26	7.87	583	579	524	368	3.03
Rent	3.76	7.95	8.34	7.19	437	741	575	401	4.79
Annual Family Income									
Under $10,000	3.81	7.90	8.34	7.56	497	640	650	505	4.29
$10,000 to $19,999	3.86	7.92	8.32	7.56	515	531	546	312	4.44
$20,000 to $29,999	3.80	7.97	8.30	7.91	609	558	406	440	3.92
$30,000 or More	3.82	7.91	8.09	7.76	665	816	548	299	4.52
Number of People in Household									
Single Person	3.79	8.09	8.41	7.33	450	689	674	452	4.78
2 to 4 People	3.84	7.91	8.21	7.81	574	610	531	360	3.43
5 or More People	3.80	7.82	8.51	8.06	607	546	347	279	6.03
Age of Household Head									
Less than 25 Years	3.88	Q	8.38	7.80	511	Q	432	634	5.82
25 to 59 Years	3.83	7.92	8.20	7.90	611	579	482	272	3.63
60 Years or Older	3.79	7.94	8.37	7.42	480	688	617	566	4.01

See footnotes at end of table.

Table 25. Average Residential Prices and Expenditures for Fuel Oil/Kerosene, 1978 Through 1984 (Continued)

South

Household Characteristics	Fuel Price (Dollars per Million Btu)				Expenditures (Dollars per Household)				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	0.33	0.23	0.27	0.61	2.83	2.49	3.26	3.43	
All Households	$3.94	$8.12	$8.51	$8.14	$291	$606	$383	$285	2.56
Census Division									
South Atlantic	--	8.12	8.52	8.12	--	620	417	315	2.66
East South Central	--	8.09	8.42	8.32	--	332	180	166	8.26
West South Central	--	Q	Q	8.66	--	Q	Q	Q	12.73
Weather Zone									
Fewer than 2,000 CDD and--									
5,500 to 7,000 HDD	Q	--	--	--	Q	--	--	--	Q
4,000 to 5,499 HDD	3.95	8.05	8.50	7.87	436	643	485	434	3.57
Fewer than 4,000 HDD	3.84	8.17	8.52	8.45	291	619	335	222	2.94
More than 2,000 CDD and Fewer than 4,000 HDD	4.31	8.40	8.71	8.71	144	390	130	151	5.21
Year of Construction									
Before 1950	3.90	8.10	8.56	8.21	351	658	543	435	2.73
1950 to 1974	3.96	8.14	8.46	8.02	270	605	322	218	3.74
After 1974	3.87	8.07	8.51	8.27	307	421	133	108	D
Main Space Heating Fuel									
Electricity	Q	Q	8.64	9.34	Q	186	56	31	5.20
Natural Gas	Q	Q	8.44	6.81	Q	Q	Q	104	9.17
Fuel Oil/Kerosene	3.94	Q	8.51	8.24	298	678	519	440	2.16
LPG	--	Q	Q	Q	--	Q	Q	Q	Q
Wood	Q	7.69	8.66	8.07	Q	66	118	Q	12.05
Other or None	--	--	Q	Q	--	--	Q	Q	Q
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	8.12	8.58	8.07	--	509	306	237	4.64
1,000 to 1,999	--	8.16	8.56	8.14	--	590	389	293	2.86
2,000 or More	--	8.05	8.38	8.23	--	826	481	375	3.60
Air Conditioning									
Yes	3.94	8.14	8.47	8.21	299	639	364	238	2.97
No	3.93	8.07	8.59	8.05	270	551	420	372	3.07
Main Water Heating Fuel									
Electricity	3.95	8.16	8.53	8.27	258	514	307	237	2.59
Natural Gas	Q	8.02	8.56	7.47	Q	680	351	249	5.19
Fuel Oil/Kerosene	3.87	8.06	8.53	8.19	542	878	792	790	4.58
LPG	3.97	8.20	8.61	8.23	321	514	Q	Q	8.43
Other or None	3.79	Q	Q	9.02	205	Q	Q	143	3.40
Ownership Status									
Own	3.94	8.13	8.50	8.19	296	604	362	294	2.64
Rent	3.92	8.10	8.53	8.02	255	610	441	265	4.65
Annual Family Income									
Under $10,000	3.91	8.16	8.62	7.94	241	602	423	422	3.89
$10,000 to $19,999	3.96	8.05	8.49	8.46	285	556	419	258	3.73
$20,000 to $29,999	3.97	8.14	8.36	8.38	350	598	326	142	5.62
$30,000 or More	3.90	8.12	8.50	8.17	347	733	337	225	4.63
Number of People in Household									
Single Person	3.89	8.15	8.60	8.04	297	661	490	446	4.05
2 to 4 People	3.95	8.12	8.50	8.19	283	578	369	250	3.08
5 or More People	3.95	8.06	8.43	8.07	338	708	315	220	5.37
Age of Household Head									
Less than 25 Years	3.98	Q	8.56	8.07	211	Q	439	302	11.96
25 to 59 Years	3.94	8.13	8.47	8.13	281	569	331	212	3.24
60 Years or Older	3.93	8.11	8.56	8.16	334	674	483	433	3.50

See footnotes at end of table.

Table 25. Average Residential Prices and Expenditures for Fuel Oil/Kerosene, 1978 Through 1984 (Continued)

West

Household Characteristics	Fuel Price (Dollars per Million Btu)				Expenditures (Dollars per Household)				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	0.33	0.23	0.27	0.61	2.83	2.49	3.26	3.43	
All Households	$3.77	$7.86	$8.58	$7.85	$382	$499	$408	$443	3.22
Census Division									
Mountain	--	Q	8.26	7.77	--	Q	417	369	11.65
Pacific	--	7.91	8.71	7.89	--	499	405	487	3.30
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	Q	Q	8.59	Q	Q	Q	Q	Q	16.87
5,500 to 7,000 HDD	3.74	7.66	Q	7.74	330	502	Q	415	8.43
4,000 to 5,499 HDD	Q	7.87	8.67	7.76	Q	474	393	477	3.39
Fewer than 4,000 HDD	--	Q	Q	Q	--	Q	Q	Q	Q
More than 2,000 CDD and Fewer than 4,000 HDD	Q	Q	Q	--	Q	Q	225	--	14.49
Year of Construction									
Before 1950	3.77	7.84	8.64	7.86	390	477	424	650	3.80
1950 to 1974	3.78	7.88	8.48	7.78	365	522	404	307	4.72
After 1974	--	--	8.67	Q	--	--	Q	Q	D
Main Space Heating Fuel									
Electricity	Q	Q	Q	Q	Q	Q	Q	Q	Q
Natural Gas	--	Q	Q	Q	--	Q	Q	Q	Q
Fuel Oil/Kerosene	3.77	7.87	8.56	7.83	398	545	526	628	2.99
LPG	--	Q	Q	--	--	Q	Q	--	Q
Wood	Q	7.46	8.93	7.86	Q	Q	186	Q	17.39
Other or None	--	Q	Q	Q	--	Q	225	Q	14.49
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	7.87	8.66	8.23	--	313	384	328	5.25
1,000 to 1,999	--	7.99	8.54	7.80	--	601	342	386	5.70
2,000 or More	--	7.68	8.53	7.78	--	490	554	603	5.24
Air Conditioning									
Yes	3.79	7.57	8.28	8.02	452	484	385	457	7.78
No	3.77	7.92	8.65	7.80	366	502	414	438	3.37
Main Water Heating Fuel									
Electricity	3.77	7.81	8.58	7.79	379	467	430	561	3.25
Natural Gas	--	Q	Q	Q	--	Q	Q	Q	Q
Fuel Oil/Kerosene	--	8.03	8.61	Q	--	579	422	Q	11.25
LPG	Q	Q	Q	7.96	Q	Q	Q	Q	26.84
Other or None	Q	--	--	Q	Q	--	--	Q	Q
Ownership Status									
Own	3.76	7.85	8.62	7.84	413	503	401	412	4.14
Rent	3.82	7.87	8.44	7.90	294	482	438	552	4.52
Annual Family Income									
Under $10,000	3.80	7.83	8.52	7.89	436	417	534	613	5.87
$10,000 to $19,999	3.81	7.77	8.47	7.92	368	499	427	598	4.95
$20,000 to $29,999	3.66	7.90	8.52	7.79	315	420	353	399	4.64
$30,000 or More	3.64	7.91	8.77	7.77	300	645	372	266	6.81
Number of People in Household									
Single Person	3.77	8.00	8.51	7.91	371	562	448	581	4.58
2 to 4 People	3.79	7.85	8.59	7.82	389	490	424	467	3.56
5 or More People	3.56	7.63	8.63	Q	334	456	303	205	10.78

See footnotes at end of table.

Table 25. Average Residential Prices and Expenditures for Fuel Oil/Kerosene, 1978 Through 1984 (Continued)

West

Household Characteristics	Fuel Price (Dollars per Million Btu)				Expenditures (Dollars per Household)				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	0.33	0.23	0.27	0.61	2.83	2.49	3.26	3.43	
Age of Household Head									
Less than 25 Years	Q	Q	Q	Q	Q	Q	Q	Q	Q
25 to 59 Years	3.80	7.80	8.59	7.90	364	510	377	436	3.92
60 Years or Older	3.74	7.99	8.57	7.74	414	504	467	485	4.56

-- Data not applicable or not available.
D The RSEs calculated using the row and column factors are unreliable. Reliable RSE estimates for each cell are found in Appendix A.
Q Data withheld due to large variance (1.96 * standard error > value).
Note: To obtain a Relative Standard Error Percent (RSE) for any table cell, multiply the cell's corresponding column and row factors.
See *Glossary for definition of terms used in this report.*
Data may not sum to totals because of rounding.
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

Detailed Statistics

Table 26. Counts of U.S. Households Using Fuel Oil/Kerosene, 1978 Through 1984

United States

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.44	1.15	1.05	0.98	0.99	0.88	0.86	0.78	
All Households	17.2	15.4	15.5	17.5	100.0%	100.0%	100.0%	100.0%	B
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	2.0	2.5	2.4	2.1	11.4	16.2	15.3	12.1	29.76
5,500 to 7,000 HDD	4.7	4.0	4.1	4.9	27.0	26.0	26.2	28.3	12.95
4,000 to 5,499 HDD	7.6	7.1	7.1	7.4	44.0	46.4	45.5	42.3	10.80
Fewer than 4,000 HDD	1.9	1.3	1.6	2.0	11.0	8.7	10.1	11.6	23.86
More than 2,000 CDD and Fewer than 4,000 HDD	1.1	.4	.5	1.0	6.6	2.7	2.9	5.7	30.74
Year of Construction									
Before 1950	9.8	8.6	8.0	8.7	56.8	55.7	51.5	49.9	6.48
1950 to 1974	7.0	5.9	6.3	6.7	40.7	38.3	40.5	38.2	8.02
After 1974	.4	.9	1.2	2.1	2.5	6.0	8.0	11.9	D
Main Space Heating Fuel									
Electricity	.1	.3	.9	1.2	.8	1.9	5.5	6.8	26.13
Natural Gas	Q	.5	1.0	2.0	Q	3.1	6.2	11.3	24.85
Fuel Oil/Kerosene	16.9	13.4	12.0	12.2	98.3	86.8	77.7	69.8	2.98
LPG	--	Q	Q	.3	--	Q	Q	2.0	58.72
Wood	.1	1.1	1.2	1.6	.6	7.4	7.7	9.1	22.23
Other or None	--	.1	.3	.2	--	.5	1.8	.9	34.31
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	5.3	4.9	6.0	--	34.3	31.7	34.3	6.89
1,000 to 1,999	--	5.9	6.3	7.1	--	38.3	40.8	40.9	5.91
2,000 or More	--	4.2	4.3	4.3	--	27.4	27.5	24.8	7.71
Air Conditioning									
Yes	8.8	7.5	8.0	9.2	51.2	48.6	51.4	52.6	6.29
No	8.4	7.9	7.5	8.3	48.8	51.4	48.6	47.4	6.90
Main Water Heating Fuel									
Electricity	8.2	5.9	6.5	7.5	47.4	38.4	41.9	43.2	7.78
Natural Gas	2.3	1.7	2.5	3.4	13.2	11.2	16.2	19.7	12.48
Fuel Oil/Kerosene	5.8	7.1	5.7	5.4	33.5	45.9	36.5	31.1	7.13
LPG	.9	.6	.7	.8	5.4	3.6	4.3	4.8	23.05
Other or None	.1	.1	.2	.2	.5	.8	1.1	1.2	33.74
Ownership Status									
Own	12.3	10.2	10.9	11.8	71.4	66.1	70.4	67.7	4.63
Rent	4.9	5.2	4.6	5.6	28.6	33.9	29.6	32.3	8.29
Annual Family Income									
Under $10,000	5.6	5.0	3.9	4.5	32.8	32.4	25.0	25.7	7.38
$10,000 to $19,999	5.9	5.0	4.6	4.6	34.2	32.5	30.0	26.3	7.15
$20,000 to $29,999	3.4	3.1	3.3	3.5	19.9	19.9	21.4	20.1	7.88
$30,000 or More	2.3	2.3	3.7	4.9	13.1	15.1	23.6	27.8	10.05
Number of People in Household									
Single Person	3.0	3.0	3.2	3.7	17.2	19.7	20.7	21.3	8.78
2 to 4 People	11.9	10.4	10.1	11.8	68.9	67.5	65.4	67.6	3.73
5 or More People	2.4	2.0	2.1	1.9	13.9	12.8	13.8	11.1	9.34
Age of Household Head									
Less than 25 Years	1.3	.8	.8	.8	7.5	5.1	5.1	4.7	19.06
25 to 59 Years	11.0	9.7	9.4	11.1	63.7	62.7	60.9	63.8	4.25
60 Years or Older	5.0	5.0	5.3	5.5	28.8	32.2	33.9	31.5	6.63

See footnotes at end of table.

Table 26. Counts of U.S. Households Using Fuel Oil/Kerosene, 1978 Through 1984 (Continued)

Northeast

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.44	1.15	1.05	0.98	0.99	0.88	0.86	0.78	
All Households	8.9	9.2	8.8	9.5	100.0%	100.0%	100.0%	100.0%	B
Census Division									
New England	--	2.7	2.5	2.5	--	29.3	28.3	26.3	9.38
Middle Atlantic	--	6.5	6.3	7.0	--	70.7	71.7	73.7	5.00
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	Q	Q	Q	1.1	Q	13.2	11.9	11.1	52.01
5,500 to 7,000 HDD	2.3	3.2	3.2	3.5	26.0	34.9	36.0	36.4	16.71
4,000 to 5,499 HDD	5.5	4.8	4.6	5.0	62.1	51.9	52.1	52.4	11.40
Year of Construction									
Before 1950	6.1	5.7	5.0	5.4	68.4	61.5	57.2	56.8	8.14
1950 to 1974	2.5	3.2	3.2	3.3	28.6	34.5	36.6	34.8	12.26
After 1974	Q	.4	.5	.8	Q	4.0	6.2	8.4	D
Main Space Heating Fuel									
Electricity	Q	Q	Q	.4	Q	Q	Q	3.7	63.48
Natural Gas	Q	.3	.4	.2	Q	3.2	4.8	2.1	40.59
Fuel Oil/Kerosene	8.8	8.2	7.6	8.2	99.5	89.2	85.7	86.0	3.06
LPG	--	--	Q	Q	--	--	Q	Q	Q
Wood	--	.6	.5	.6	--	6.1	5.8	6.8	32.53
Other or None	--	.0	.2	.1	--	.5	1.8	1.1	33.37
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	3.4	3.0	3.4	--	37.0	34.3	35.9	8.22
1,000 to 1,999	--	3.2	3.3	3.4	--	34.5	37.4	35.8	7.98
2,000 or More	--	2.6	2.5	2.7	--	28.4	28.3	28.3	9.84
Air Conditioning									
Yes	4.3	4.4	4.4	4.6	48.3	47.7	49.8	48.3	8.29
No	4.6	4.8	4.4	4.9	51.7	52.3	50.2	51.7	9.04
Main Water Heating Fuel									
Electricity	1.7	1.6	1.8	2.3	19.6	17.9	20.1	23.7	12.68
Natural Gas	1.5	1.1	1.7	1.7	16.8	12.4	19.2	17.9	15.43
Fuel Oil/Kerosene	5.2	6.1	5.0	5.1	58.3	66.4	57.2	53.7	6.02
LPG	.5	.2	.2	.4	5.2	2.4	2.5	3.9	33.03
Other or None	--	.1	.1	Q	--	.9	Q	Q	50.91
Ownership Status									
Own	5.3	5.8	5.7	6.2	59.7	62.6	65.1	65.0	6.91
Rent	3.6	3.4	3.1	3.3	40.3	37.4	34.9	35.0	9.50
Annual Family Income									
Under $10,000	3.1	2.8	2.3	2.2	35.0	30.8	25.6	23.4	9.32
$10,000 to $19,999	2.9	3.1	2.6	2.3	33.1	33.4	29.4	24.6	9.78
$20,000 to $29,999	1.8	1.9	1.9	2.2	20.1	20.6	21.4	22.7	10.89
$30,000 or More	1.1	1.4	2.1	2.8	11.9	15.2	23.6	29.2	14.50
Number of People in Household									
Single Person	1.7	1.9	2.0	2.1	19.4	20.9	23.2	21.8	12.02
2 to 4 People	5.7	6.1	5.5	6.1	63.9	65.9	62.6	64.5	4.88
5 or More People	1.5	1.2	1.2	1.3	16.7	13.1	14.2	13.7	12.51
Age of Household Head									
Less than 25 Years	.7	.4	.5	.5	7.7	4.2	5.2	4.8	21.42
25 to 59 Years	5.9	5.8	5.3	6.0	66.6	63.0	60.0	63.0	5.74
60 Years or Older	2.3	3.0	3.1	3.1	25.7	32.8	34.8	32.2	9.26

See footnotes at end of table.

Table 26. Counts of U.S. Households Using Fuel Oil/Kerosene, 1978 Through 1984 (Continued)

North Central

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.44	1.15	1.05	0.98	0.99	0.88	0.86	0.78	
All Households	3.2	2.0	2.4	2.6	100.0%	100.0%	100.0%	100.0%	B
Census Division									
East North Central	--	1.5	1.8	2.0	--	75.1	78.5	75.7	10.67
West North Central	--	.5	.5	.6	--	24.9	21.5	24.3	24.09
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	Q	1.3	1.3	1.0	Q	61.9	54.0	38.2	27.59
5,500 to 7,000 HDD	1.9	.7	.8	1.3	59.0	33.8	33.0	48.4	23.11
4,000 to 5,499 HDD	.6	Q	Q	.4	Q	Q	Q	13.4	53.68
Year of Construction									
Before 1950	2.1	1.2	1.2	1.3	65.1	57.3	52.3	48.7	14.54
1950 to 1974	1.0	.7	.8	.7	32.6	35.1	33.6	27.4	16.49
After 1974	Q	.2	.3	.6	Q	7.7	14.1	23.9	D
Main Space Heating Fuel									
Electricity	Q	Q	.3	.2	Q	Q	10.8	7.5	50.53
Natural Gas	--	.1	.3	.9	--	Q	11.2	33.5	26.49
Fuel Oil/Kerosene	3.1	1.5	1.6	1.2	98.3	76.5	66.8	45.0	9.30
LPG	--	Q	Q	Q	--	Q	Q	Q	Q
Wood	Q	.3	Q	.3	Q	14.9	Q	11.9	55.67
Other or None	--	Q	--	--	--	Q	--	--	Q
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	.4	.5	.7	--	18.4	19.1	28.6	20.29
1,000 to 1,999	--	1.0	1.1	1.1	--	48.2	48.3	43.7	15.62
2,000 or More	--	.7	.8	.7	--	33.5	32.6	27.8	15.26
Air Conditioning									
Yes	1.3	.7	1.0	1.4	41.8	35.2	42.5	53.6	16.22
No	1.8	1.3	1.4	1.2	58.2	64.8	57.5	46.4	14.42
Main Water Heating Fuel									
Electricity	2.0	1.5	1.6	1.5	63.5	73.6	68.2	58.8	12.28
Natural Gas	.7	.2	.4	.9	21.6	10.3	17.1	34.3	24.47
Fuel Oil/Kerosene	Q	.2	Q	Q	Q	8.9	Q	Q	59.49
LPG	Q	.1	Q	Q	8.5	6.5	Q	Q	47.85
Other or None	--	Q	Q	Q	--	Q	Q	Q	Q
Ownership Status									
Own	2.6	1.6	2.0	1.9	83.4	80.4	83.1	74.0	8.18
Rent	.5	.4	.4	.7	16.6	19.6	16.9	26.0	24.65
Annual Family Income									
Under $10,000	.8	.7	.6	.6	26.0	32.6	23.9	24.1	22.60
$10,000 to $19,999	1.0	.7	.7	.9	32.4	32.3	30.8	32.6	18.57
$20,000 to $29,999	.8	.4	.7	.4	24.6	21.8	27.8	16.9	19.81
$30,000 or More	.5	.3	.4	.7	17.0	13.4	17.5	26.4	23.62
Number of People in Household									
Single Person	.5	.3	.4	.7	15.7	16.0	18.0	25.3	22.12
2 to 4 People	2.2	1.3	1.6	1.7	70.3	64.5	68.6	66.2	10.84
5 or More People	.4	.4	.3	.2	13.9	19.5	13.4	8.5	28.45
Age of Household Head									
Less than 25 Years	.2	.1	Q	.1	6.6	6.0	Q	4.6	45.10
25 to 59 Years	1.9	1.2	1.4	1.7	58.8	57.6	58.6	65.4	12.11
60 Years or Older	1.1	.7	.9	.8	34.6	36.3	38.4	29.9	16.42

See footnotes at end of table.

Table 26. Counts of U.S. Households Using Fuel Oil/Kerosene, 1978 Through 1984 (Continued)

South

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.44	1.15	1.05	0.98	0.99	0.88	0.86	0.78	
All Households	4.3	3.6	3.7	4.6	100.0%	100.0%	100.0%	100.0%	B
Census Division									
South Atlantic	--	3.5	3.2	3.9	--	95.3	87.1	84.0	6.47
East South Central	--	.1	.4	.5	--	4.0	10.3	11.7	29.26
West South Central	--	Q	Q	.2	--	Q	Q	4.3	55.33
Weather Zone									
Fewer than 2,000 CDD and--									
5,500 to 7,000 HDD	Q	--	--	--	Q	--	--	--	Q
4,000 to 5,499 HDD	1.1	1.9	1.8	1.7	25.9	52.5	47.3	36.8	28.21
Fewer than 4,000 HDD	1.9	1.3	1.5	1.9	43.7	36.3	41.5	41.7	23.86
More than 2,000 CDD and Fewer than 4,000 HDD	1.1	.4	.4	1.0	26.0	11.2	11.2	21.6	31.45
Year of Construction									
Before 1950	1.1	1.5	1.3	1.7	24.5	40.7	35.6	37.3	11.52
1950 to 1974	3.2	1.7	2.0	2.3	73.3	48.3	54.9	50.0	10.52
After 1974	.1	.4	.4	.6	2.1	11.0	9.5	12.8	D
Main Space Heating Fuel									
Electricity	Q	Q	.4	.6	Q	Q	11.1	13.2	37.38
Natural Gas	Q	Q	.2	.8	Q	Q	6.6	17.4	50.65
Fuel Oil/Kerosene	4.2	3.1	2.5	2.4	96.9	86.5	67.2	51.3	8.23
LPG	--	Q	Q	Q	--	Q	Q	Q	Q
Wood	Q	.2	.4	.5	Q	6.9	11.0	11.5	35.26
Other or None	--	--	Q	Q	--	--	Q	Q	Q
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	1.4	1.2	1.7	--	38.4	32.9	36.4	17.00
1,000 to 1,999	--	1.5	1.6	2.3	--	41.7	44.1	48.8	13.41
2,000 or More	--	.7	.8	.7	--	19.9	23.0	14.8	17.95
Air Conditioning									
Yes	3.0	2.3	2.4	3.0	70.4	63.1	65.9	65.0	10.79
No	1.3	1.3	1.3	1.6	29.6	36.9	34.1	35.0	15.79
Main Water Heating Fuel									
Electricity	3.6	2.3	2.6	3.3	82.9	63.4	70.4	70.5	10.34
Natural Gas	Q	.3	.4	.7	Q	9.4	10.3	15.8	34.42
Fuel Oil/Kerosene	.4	.8	.4	.2	8.9	20.9	11.5	4.3	35.43
LPG	.2	.2	.2	.4	4.1	5.7	6.6	7.8	35.18
Other or None	.1	Q	Q	.1	1.9	Q	Q	1.7	61.28
Ownership Status									
Own	3.7	2.3	2.7	3.2	86.3	64.9	73.4	68.1	8.84
Rent	.6	1.3	1.0	1.5	13.7	35.1	26.6	31.9	20.66
Annual Family Income									
Under $10,000	1.4	1.4	.9	1.5	31.6	39.9	25.7	33.0	16.48
$10,000 to $19,999	1.6	1.1	1.1	1.2	37.9	30.9	31.1	25.8	14.19
$20,000 to $29,999	.7	.5	.6	.8	16.9	14.6	17.1	16.2	16.76
$30,000 or More	.6	.5	1.0	1.2	13.6	14.6	26.1	25.0	18.58
Number of People in Household									
Single Person	.5	.7	.6	.9	12.5	19.3	17.1	19.0	18.92
2 to 4 People	3.4	2.6	2.6	3.5	77.5	71.8	70.0	74.5	7.30
5 or More People	.4	.3	.5	.3	10.0	8.9	12.9	6.6	19.51
Age of Household Head									
Less than 25 Years	.4	Q	.3	.2	8.1	7.2	6.8	4.8	41.69
25 to 59 Years	2.7	2.3	2.4	3.0	63.6	64.2	64.1	64.1	8.79
60 Years or Older	1.2	1.0	1.1	1.4	28.3	28.5	29.1	31.2	14.20

See footnotes at end of table.

Table 26. Counts of U.S. Households Using Fuel Oil/Kerosene, 1978 Through 1984 (Continued)

West

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.44	1.15	1.05	0.98	0.99	0.88	0.86	0.78	
All Households	0.8	0.6	0.6	0.7	100.0%	100.0%	100.0%	100.0%	8
Census Division									
Mountain	—	Q	Q	.3	—	Q	27.0	37.7	54.95
Pacific	—	.5	.5	.4	—	82.6	73.0	62.3	16.55
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	Q	Q	Q	Q	Q	Q	Q	Q	Q
5,500 to 7,000 HDD	.3	Q	Q	Q	33.7	Q	Q	31.4	60.50
4,000 to 5,499 HDD	Q	.4	.4	.3	Q	67.0	64.0	48.3	24.75
Fewer than 4,000 HDD	—	Q	Q	.1	—	Q	Q	12.5	78.64
More than 2,000 CDD and Fewer than 4,000 HDD	Q	Q	.0	—	Q	Q	6.5	—	53.74
Year of Construction									
Before 1950	.6	.3	.4	.3	68.2	51.8	61.2	45.3	18.50
1950 to 1974	.3	.3	.2	.3	31.8	48.2	36.3	46.6	20.25
After 1974	—	—	.0	Q	—	—	2.5	Q	D
Main Space Heating Fuel									
Electricity	Q	Q	Q	Q	Q	Q	Q	Q	Q
Natural Gas	—	Q	Q	.1	—	Q	Q	Q	74.70
Fuel Oil/Kerosene	.8	.5	.4	.5	93.0	86.6	67.6	66.2	13.36
LPG	—	Q	Q	—	—	Q	Q	—	Q
Wood	Q	.0	.1	.1	Q	7.0	15.0	15.6	39.81
Other or None	—	Q	.0	Q	—	Q	6.5	Q	59.60
Measured Heated Area of Residence *(square feet)*									
Less than 1,000	—	.1	.2	.1	—	21.3	35.6	21.0	26.31
1,000 to 1,999	—	.2	.3	.3	—	41.7	40.2	47.2	24.34
2,000 or More	—	.2	.2	.2	—	37.0	24.2	31.7	27.60
Air Conditioning									
Yes	Q	.1	.1	.2	18.4	18.3	20.6	23.9	34.93
No	.7	.5	.5	.5	81.6	81.7	79.4	76.1	11.86
Main Water Heating Fuel									
Electricity	.8	.5	.5	.5	96.8	86.1	81.5	68.6	13.03
Natural Gas	—	Q	Q	Q	—	Q	Q	Q	Q
Fuel Oil/Kerosene	—	.0	.1	Q	—	6.2	10.4	Q	46.92
LPG	Q	Q	Q	.0	Q	Q	Q	6.4	80.28
Other or None	Q	—	—	Q	Q	—	—	Q	Q
Ownership Status									
Own	.6	.4	.5	.5	74.3	78.3	79.6	77.9	13.71
Rent	.2	.1	.1	.2	25.7	21.7	20.4	22.1	33.17
Annual Family Income									
Under $10,000	.4	.1	.1	.1	42.3	10.4	15.7	15.0	26.28
$10,000 to $19,999	.3	.2	.2	.2	33.2	30.6	28.1	28.8	26.90
$20,000 to $29,999	.1	.2	.2	.2	15.8	34.7	23.9	21.9	24.56
$30,000 or More	.1	.1	.2	.2	Q	24.3	32.2	34.4	25.32
Number of People in Household									
Single Person	.2	.1	.1	.1	24.4	15.9	17.7	14.1	26.29
2 to 4 People	.6	.4	.4	.5	71.0	75.6	65.9	70.5	12.28
5 or More People	.0	.0	.1	.1	4.6	8.5	16.5	15.4	29.87

See footnotes at end of table.

Table 26. Counts of U.S. Households Using Fuel Oil/Kerosene, 1978 Through 1984 (Continued)

West

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.44	1.15	1.05	0.98	0.99	0.88	0.86	0.78	
Age of Household Head									
Less than 25 Years	Q	Q	Q	Q	5.8	Q	Q	Q	74.51
25 to 59 Years	0.4	0.4	0.4	0.5	52.9	66.7	63.5	65.9	15.46
60 Years or Older	.3	.2	.2	.2	41.3	30.9	34.3	30.7	23.96

-- Data not applicable or not available.

B The RSEs for Percent of Households values given in this row are 0.0. The RSE Row Factor for Millions of Households values is 4.72 for United States totals, 5.95 for Northeast Census Region totals, 11.88 for North Central Census Region totals, 10.84 for South Census Region totals and 17.69 for West Census Region totals.

D The RSEs calculated using the row and column factors are unreliable. Reliable RSE estimates for each cell are found in Appendix A.

Q Data withheld due to large variance (1.96 * standard error > value).

Note: To obtain a Relative Standard Error Percent (RSE) for any table cell, multiply the cell's corresponding column and row factors.

See Glossary for definition of terms used in this report.

Data may not sum to totals because of rounding.

Percentages are calculated on unrounded numbers.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

Table 27. Average Residential Consumption for Liquefied Petroleum Gas, 1978 Through 1984

United States

Household Characteristics	Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	1.29	0.88	0.95	0.94	
All Households	47.2	47.6	39.4	40.1	5.92
Weather Zone					
Fewer than 2,000 CDD and--					
More than 7,000 HDD	Q	51.3	46.8	48.0	17.55
5,500 to 7,000 HDD	44.7	52.3	45.8	51.6	17.40
4,000 to 5,499 HDD	46.7	47.9	37.4	37.8	17.13
Fewer than 4,000 HDD	43.8	44.7	38.7	43.2	10.35
More than 2,000 CDD and Fewer than 4,000 HDD	44.8	43.2	31.1	25.7	12.11
Year of Construction					
Before 1950	47.2	46.5	38.5	42.4	10.27
1950 to 1974	45.4	48.8	37.8	36.7	8.39
After 1974	69.3	46.5	48.1	45.7	D
Main Space Heating Fuel					
Electricity	23.4	27.1	Q	14.1	28.79
Natural Gas	Q	Q	Q	Q	Q
Fuel Oil/Kerosene	16.9	12.1	12.1	13.6	10.87
LPG	80.1	76.8	58.5	60.4	5.80
Wood	30.3	28.5	23.6	27.0	9.94
Other or None	Q	20.2	17.1	23.9	18.91
Measured Heated Area of Residence (square feet)					
Less than 1,000	--	42.5	32.2	32.5	7.74
1,000 to 1,999	--	47.6	42.0	45.7	7.44
2,000 or More	--	59.1	50.6	51.7	13.76
Air Conditioning					
Yes	51.9	46.5	41.9	40.3	8.76
No	42.4	48.5	37.5	40.0	8.32
Main Water Heating Fuel					
Electricity	44.7	34.8	30.8	31.4	9.15
Natural Gas	Q	Q	Q	Q	Q
Fuel Oil/Kerosene	11.0	8.9	7.1	14.8	25.10
LPG	56.9	66.2	52.8	52.1	6.31
Other or None	Q	35.3	14.5	11.9	37.68
Ownership Status					
Own	50.3	48.4	39.8	40.4	6.35
Rent	37.4	44.7	38.2	39.3	10.54
Annual Family Income					
Under $10,000	39.4	40.1	38.5	42.1	8.57
$10,000 to $19,999	51.9	46.4	37.5	36.7	8.37
$20,000 to $29,999	48.0	60.8	46.0	42.8	13.41
$30,000 or More	77.5	56.7	38.9	39.3	17.70
Number of People in Household					
Single Person	44.5	42.3	36.8	38.8	14.10
2 to 4 People	44.4	45.7	36.9	39.4	6.62
5 or More People	65.3	63.8	54.2	46.7	14.09
Age of Household Head					
Less than 25 Years	39.4	50.4	26.9	30.2	20.00
25 to 59 Years	52.8	48.8	40.4	40.0	7.78
60 Years or Older	38.1	44.5	39.6	41.5	9.39

See footnotes at end of table.

Table 27. Average Residential Consumption for Liquefied Petroleum Gas, 1978 Through 1984 (Continued)

Northeast

Household Characteristics	Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	1.29	0.88	0.95	0.94	
All Households	22.1	21.3	20.5	20.1	20.27
Census Division					
New England	--	19.3	18.5	27.6	27.22
Middle Atlantic	--	22.8	21.9	15.9	29.99
Weather Zone					
Fewer than 2,000 CDD and--					
More than 7,000 HDD	Q	Q	24.4	21.8	32.81
5,500 to 7,000 HDD	Q	21.4	16.6	21.3	32.42
4,000 to 5,499 HDD	21.1	23.6	Q	Q	66.98
Year of Construction					
Before 1950	21.7	16.9	20.2	26.3	18.98
1950 to 1974	23.3	30.4	21.3	15.8	36.23
After 1974	Q	6.3	Q	Q	D
Main Space Heating Fuel					
Electricity	Q	Q	Q	Q	Q
Natural Gas	Q	Q	Q	--	Q
Fuel Oil/Kerosene	15.5	10.6	12.7	14.2	15.73
LPG	Q	82.1	63.3	69.6	17.42
Wood	Q	19.4	11.8	10.8	23.23
Other or None	Q	--	Q	23.9	66.65
Measured Heated Area of Residence (square feet)					
Less than 1,000	--	31.1	27.9	18.2	26.18
1,000 to 1,999	--	16.4	18.4	24.2	36.83
2,000 or More	--	17.5	13.2	19.2	28.65
Air Conditioning					
Yes	23.4	16.0	Q	15.7	36.55
No	21.2	23.4	22.7	22.5	21.93
Main Water Heating Fuel					
Electricity	15.5	21.6	18.9	16.2	26.38
Natural Gas	Q	Q	Q	--	Q
Fuel Oil/Kerosene	Q	9.2	5.4	15.6	24.87
LPG	35.0	34.2	34.7	27.5	22.57
Other or None	--	Q	Q	Q	Q
Ownership Status					
Own	22.0	17.1	16.3	21.3	22.56
Rent	22.2	41.4	39.2	16.4	32.32
Annual Family Income					
Under $10,000	9.7	16.4	27.8	26.2	29.94
$10,000 to $19,999	38.8	23.0	19.4	13.8	26.86
$20,000 to $29,999	15.9	23.9	17.5	21.1	27.40
$30,000 or More	Q	Q	12.6	17.5	44.40
Number of People in Household					
Single Person	Q	Q	19.7	Q	55.46
2 to 4 People	22.2	22.0	18.4	18.1	21.70
5 or More People	Q	24.2	29.4	26.2	42.97
Age of Household Head					
Less than 25 Years	9.2	Q	Q	18.3	30.79
25 to 59 Years	27.5	24.3	19.3	16.7	24.02
60 Years or Older	12.6	10.9	23.6	27.0	28.76

See footnotes at end of table.

Table 27. Average Residential Consumption for Liquefied Petroleum Gas, 1978 Through 1984 (Continued)

North Central

Household Characteristics	Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	1.29	0.88	0.95	0.94	
All Households	79.6	73.3	60.4	69.7	9.56
Census Division					
East North Central	--	74.6	55.8	67.7	9.91
West North Central	--	71.5	66.8	72.4	11.82
Weather Zone					
Fewer than 2,000 CDD and--					
More than 7,000 HDD	Q	67.0	56.8	62.2	18.00
5,500 to 7,000 HDD	Q	78.3	73.6	92.6	15.14
4,000 to 5,499 HDD	76.7	75.3	53.2	64.4	16.93
Year of Construction					
Before 1950	81.8	68.8	54.0	64.3	16.46
1950 to 1974	73.1	82.8	64.0	73.1	13.73
After 1974	Q	61.9	69.9	70.9	D
Main Space Heating Fuel					
Electricity	Q	Q	Q	Q	Q
Natural Gas	--	--	--	Q	Q
Fuel Oil/Kerosene	23.9	10.5	10.7	5.5	33.42
LPG	127.6	108.8	91.3	89.0	6.59
Wood	Q	34.9	25.7	42.0	20.51
Other or None	Q	Q	--	--	Q
Measured Heated Area of Residence (square feet)					
Less than 1,000	--	59.2	40.6	59.7	16.63
1,000 to 1,999	--	65.8	60.6	65.6	10.49
2,000 or More	--	98.2	75.7	97.5	15.25
Air Conditioning					
Yes	100.1	78.6	68.1	88.0	12.81
No	68.4	70.1	53.0	58.5	11.77
Main Water Heating Fuel					
Electricity	94.0	53.6	44.6	57.5	16.89
Natural Gas	--	--	--	Q	Q
Fuel Oil/Kerosene	Q	Q	--	--	Q
LPG	76.1	87.2	77.4	77.6	9.47
Other or None	Q	59.3	Q	--	46.15
Ownership Status					
Own	81.6	75.4	61.5	68.7	9.53
Rent	Q	62.9	46.5	75.4	24.34
Annual Family Income					
Under $10,000	65.2	56.4	63.9	71.4	13.54
$10,000 to $19,999	77.3	61.5	37.0	61.8	15.02
$20,000 to $29,999	Q	111.8	94.3	69.3	17.23
$30,000 or More	Q	100.0	66.3	80.0	19.15
Number of People in Household					
Single Person	Q	62.8	61.7	65.5	23.11
2 to 4 People	70.9	69.0	53.8	73.8	12.82
5 or More People	103.1	98.3	81.0	44.8	21.30
Age of Household Head					
Less than 25 Years	Q	67.8	Q	61.1	36.86
25 to 59 Years	92.4	78.4	60.1	66.8	14.02
60 Years or Older	59.9	64.6	67.8	74.8	13.63

See footnotes at end of table.

Table 27. Average Residential Consumption for Liquefied Petroleum Gas, 1978 Through 1984 (Continued)

South

Household Characteristics	Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	1.29	0.88	0.95	0.94	
All Households	40.9	41.6	34.0	32.1	8.86
Census Division					
South Atlantic	--	36.9	29.0	24.7	12.17
East South Central	--	50.5	34.8	35.7	17.08
West South Central	--	51.8	47.5	50.8	19.38
Weather Zone					
Fewer than 2,000 CDD and--					
5,500 to 7,000 HDD	Q	--	--	--	Q
4,000 to 5,499 HDD	23.2	24.8	27.8	23.3	25.41
Fewer than 4,000 HDD	44.1	45.8	39.4	44.4	11.93
More than 2,000 CDD and Fewer than 4,000 HDD	43.3	44.5	31.9	25.2	13.48
Year of Construction					
Before 1950	36.0	45.5	38.4	38.3	10.38
1950 to 1974	42.3	39.2	29.8	22.5	9.80
After 1974	Q	41.1	37.2	47.1	D
Main Space Heating Fuel					
Electricity	16.6	29.3	10.3	14.9	31.65
Natural Gas	Q	Q	--	Q	Q
Fuel Oil/Kerosene	14.5	14.7	11.9	12.7	14.55
LPG	57.7	58.1	43.2	43.4	8.70
Wood	33.2	23.6	25.8	23.0	13.84
Other or None	Q	Q	Q	Q	Q
Measured Heated Area of Residence (square feet)					
Less than 1,000	--	38.8	30.1	24.7	11.94
1,000 to 1,999	--	44.0	38.3	41.4	13.41
2,000 or More	--	46.1	34.7	21.2	34.49
Air Conditioning					
Yes	42.8	39.1	33.8	29.7	11.36
No	37.4	44.8	34.4	36.0	11.27
Main Water Heating Fuel					
Electricity	34.3	30.4	26.8	25.0	12.10
Natural Gas	--	Q	--	Q	Q
Fuel Oil/Kerosene	28.9	Q	Q	Q	37.35
LPG	52.3	61.8	44.9	44.8	11.04
Other or None	Q	Q	Q	Q	Q
Ownership Status					
Own	44.2	42.6	33.0	31.2	11.13
Rent	31.5	38.5	36.2	34.6	12.91
Annual Family Income					
Under $10,000	37.5	36.5	34.7	32.7	11.08
$10,000 to $19,999	43.5	48.3	37.8	30.1	11.18
$20,000 to $29,999	45.8	48.0	31.1	38.3	18.27
$30,000 or More	Q	34.2	22.8	29.4	31.41
Number of People in Household					
Single Person	41.2	39.3	36.7	29.1	20.04
2 to 4 People	39.8	40.3	32.4	28.5	9.55
5 or More People	48.0	53.2	39.2	56.6	20.20
Age of Household Head					
Less than 25 Years	36.6	46.8	30.5	Q	27.30
25 to 59 Years	43.5	40.3	33.5	33.6	8.19
60 Years or Older	37.9	42.3	35.4	29.5	15.27

See footnotes at end of table.

Table 27. Average Residential Consumption for Liquefied Petroleum Gas, 1978 Through 1984 (Continued)

West

Household Characteristics	Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	1.29	0.88	0.95	0.94	
All Households	66.5	49.4	42.7	39.4	10.04
Census Division					
Mountain	--	67.5	58.4	48.9	9.92
Pacific	--	34.1	29.2	35.2	16.08
Weather Zone					
Fewer than 2,000 CDD and--					
More than 7,000 HDD	--	67.9	70.5	52.3	14.37
5,500 to 7,000 HDD	95.1	64.9	50.7	49.2	16.57
4,000 to 5,499 HDD	Q	48.6	34.8	24.8	45.74
Fewer than 4,000 HDD	Q	38.7	34.4	38.9	20.04
More than 2,000 CDD and Fewer than 4,000 HDD	Q	29.2	24.7	29.6	17.05
Year of Construction					
Before 1950	Q	39.3	30.3	41.9	16.95
1950 to 1974	55.9	48.8	48.5	35.1	22.48
After 1974	Q	58.2	48.2	43.4	D
Main Space Heating Fuel					
Electricity	Q	29.8	Q	Q	33.13
Natural Gas	--	Q	--	Q	Q
Fuel Oil/Kerosene	Q	Q	Q	Q	Q
LPG	97.2	71.8	65.2	55.0	11.42
Wood	Q	34.9	29.0	25.4	15.57
Other or None	--	29.9	21.8	26.7	19.19
Measured Heated Area of Residence (square feet)					
Less than 1,000	--	43.8	35.7	38.1	14.00
1,000 to 1,999	--	69.2	45.4	43.7	21.67
2,000 or More	--	43.0	58.8	Q	42.80
Air Conditioning					
Yes	122.6	49.9	51.8	42.3	22.30
No	36.9	49.1	41.5	37.7	12.71
Main Water Heating Fuel					
Electricity	60.1	38.3	32.0	35.7	20.14
Natural Gas	--	Q	--	Q	Q
Fuel Oil/Kerosene	--	Q	16.4	--	30.51
LPG	Q	52.1	48.4	42.8	9.11
Other or None	--	--	Q	Q	Q
Ownership Status					
Own	70.9	51.9	43.8	35.8	14.84
Rent	Q	43.0	41.0	46.7	17.30
Annual Family Income					
Under $10,000	43.2	44.8	32.0	44.4	23.21
$10,000 to $19,999	Q	41.3	55.2	41.0	18.42
$20,000 to $29,999	Q	67.0	Q	32.8	23.64
$30,000 or More	Q	54.7	35.5	36.8	27.20
Number of People in Household					
Single Person	Q	49.2	26.0	Q	21.56
2 to 4 People	72.6	48.2	42.2	34.6	11.91
5 or More People	Q	53.3	57.7	46.9	13.84

See footnotes at end of table.

Table 27. Average Residential Consumption for Liquefied Petroleum Gas, 1978 Through 1984 (Continued)

West

Household Characteristics	Million Btu per Household				RSE Row Factor
	1978	1980	1982	1984	
RSE Column Factor:	1.29	0.88	0.95	0.94	
Age of Household Head					
Less than 25 Years	Q	Q	Q	Q	Q
25 to 59 Years	67.5	51.2	47.5	41.4	11.79
60 Years or Older	Q	44.4	32.9	34.4	18.60

-- Data not applicable or not available.
[D] The RSEs calculated using the row and column factors are unreliable. Reliable RSE estimates for each cell are found in Appendix A.
[Q] Data withheld due to large variance (1.96 * standard error > value).
Note: To obtain a Relative Standard Error Percent (RSE) for any table cell, multiply the cell's corresponding column and row factors.
See Glossary for definition of terms used in this report.
Data may not sum to totals because of rounding.
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

Detailed Statistics

Table 28. Average Residential Prices and Expenditures for Liquefied Petroleum Gas, 1978 Through 1984

United States

Household Characteristics	Fuel Price (Dollars per Million Btu)				Expenditures (Dollars per Household)				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	0.91	0.42	0.56	0.64	2.04	1.51	1.62	1.46	
All Households	$5.09	$7.92	$9.42	$9.91	$241	$377	$372	$398	2.88
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	Q	7.74	9.17	9.43	Q	397	429	453	8.36
5,500 to 7,000 HDD	5.43	7.88	8.91	9.55	243	412	408	493	8.22
4,000 to 5,499 HDD	4.97	7.83	9.35	9.91	232	375	350	374	8.16
Fewer than 4,000 HDD	5.03	7.95	9.43	9.84	220	355	365	425	4.77
More than 2,000 CDD and Fewer than 4,000 HDD	4.97	8.23	10.35	11.17	223	355	321	287	6.25
Year of Construction									
Before 1950	5.21	7.89	9.52	9.97	246	367	366	423	5.03
1950 to 1974	5.17	7.99	9.46	10.06	235	390	358	370	3.82
After 1974	3.92	7.77	9.07	9.34	271	362	437	427	D
Main Space Heating Fuel									
Electricity	5.83	8.20	9.75	13.08	137	223	305	185	14.67
Natural Gas	Q	Q	Q	Q	Q	Q	Q	Q	Q
Fuel Oil/Kerosene	7.81	10.39	12.90	14.23	132	126	156	194	6.07
LPG	4.58	7.61	8.89	9.30	367	585	521	562	2.81
Wood	4.98	8.29	10.04	10.25	151	236	237	277	5.16
Other or None	Q	11.45	16.26	13.36	Q	231	278	320	14.22
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	8.17	10.07	10.68	--	347	324	347	4.06
1,000 to 1,999	--	7.80	9.30	9.47	--	371	390	433	2.99
2,000 or More	--	7.71	8.69	9.28	--	455	440	479	6.23
Air Conditioning									
Yes	4.88	7.81	9.07	9.76	253	364	380	393	3.71
No	5.38	8.01	9.73	10.05	228	388	365	402	4.02
Main Water Heating Fuel									
Electricity	4.83	8.24	9.71	10.44	216	286	299	328	4.15
Natural Gas	Q	Q	Q	Q	Q	Q	Q	Q	Q
Fuel Oil/Kerosene	9.38	11.44	14.35	13.97	103	102	102	207	12.89
LPG	5.19	7.69	9.17	9.48	295	509	484	494	3.15
Other or None	Q	8.20	10.73	12.91	Q	290	156	154	18.52
Ownership Status									
Own	5.07	7.86	9.26	9.93	255	381	369	402	3.11
Rent	5.21	8.16	9.93	9.82	195	365	380	386	5.04
Annual Family Income									
Under $10,000	5.29	7.99	9.63	9.96	208	320	371	419	4.14
$10,000 to $19,999	5.20	8.12	9.52	10.17	270	377	357	374	4.10
$20,000 to $29,999	4.93	7.72	9.04	9.62	237	470	416	412	6.03
$30,000 or More	4.19	7.60	9.23	9.66	325	431	360	380	8.31
Number of People in Household									
Single Person	4.93	8.11	9.84	9.91	220	343	362	384	6.91
2 to 4 People	5.18	7.91	9.36	9.91	230	361	345	390	3.14
5 or More People	4.91	7.84	9.22	9.86	321	500	500	461	6.24
Age of Household Head									
Less than 25 Years	5.12	7.75	9.76	11.04	202	390	262	333	8.81
25 to 59 Years	5.09	7.94	9.34	9.72	269	388	377	388	3.46
60 Years or Older	5.10	7.93	9.54	10.14	194	353	378	421	4.85

See footnotes at end of table.

Table 28. Average Residential Prices and Expenditures for Liquefied Petroleum Gas, 1978 Through 1984 (Continued)

Northeast

Household Characteristics	Fuel Price (Dollars per Million Btu)				Expenditures (Dollars per Household)				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	0.91	0.42	0.56	0.64	2.04	1.51	1.62	1.46	
All Households	$7.93	$9.96	$11.52	$13.11	$175	$212	$237	$264	10.02
Census Division									
New England	--	10.28	11.50	11.97	--	199	213	330	13.49
Middle Atlantic	--	9.75	11.53	14.23	--	223	253	226	14.02
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	Q	10.40	11.63	11.93	Q	210	283	260	15.11
5,500 to 7,000 HDD	Q	9.67	12.09	13.76	Q	207	200	293	16.19
4,000 to 5,499 HDD	7.53	9.88	9.33	14.39	159	234	Q	Q	30.48
Year of Construction									
Before 1950	8.18	10.76	12.44	13.15	177	182	252	345	8.71
1950 to 1974	7.65	9.32	10.64	12.90	179	283	226	204	18.25
After 1974	Q	10.94	Q	14.77	Q	68	193	110	D
Main Space Heating Fuel									
Electricity	Q	Q	Q	Q	Q	Q	Q	Q	Q
Natural Gas	Q	Q	Q	--	Q	Q	Q	--	Q
Fuel Oil/Kerosene	8.96	11.38	13.69	14.70	139	121	174	209	7.24
LPG	Q	8.91	9.83	10.81	Q	732	622	752	11.40
Wood	Q	10.30	12.75	14.75	Q	200	151	159	11.63
Other or None	Q	--	Q	14.97	Q	--	Q	358	29.83
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	9.71	11.01	13.30	--	302	307	242	12.36
1,000 to 1,999	--	9.89	11.18	11.81	--	162	206	286	19.41
2,000 or More	--	10.46	13.64	14.60	--	183	180	280	12.68
Air Conditioning									
Yes	7.88	11.09	10.99	14.46	185	178	158	227	16.62
No	7.97	9.65	11.64	12.60	169	226	264	284	11.12
Main Water Heating Fuel									
Electricity	8.11	9.46	11.74	13.77	126	205	222	223	13.56
Natural Gas	Q	Q	Q	--	Q	Q	Q	--	Q
Fuel Oil/Kerosene	Q	11.34	15.24	13.72	Q	104	83	214	13.04
LPG	7.55	10.05	10.88	12.51	264	344	377	344	11.01
Other or None	--	Q	Q	15.33	--	Q	Q	100	1.34
Ownership Status									
Own	8.16	10.56	12.13	13.28	180	181	198	283	10.76
Rent	7.20	8.77	10.41	12.43	160	363	408	204	15.96
Annual Family Income									
Under $10,000	10.37	10.53	10.37	11.69	101	173	288	307	13.22
$10,000 to $19,999	6.99	10.15	12.53	15.22	271	233	243	210	12.80
$20,000 to $29,999	8.73	9.22	11.94	13.25	139	221	209	279	14.56
$30,000 or More	Q	9.90	13.11	14.11	Q	197	166	247	17.96
Number of People in Household									
Single Person	7.81	10.58	10.87	11.91	Q	Q	214	257	29.20
2 to 4 People	7.96	9.88	12.26	13.24	176	217	226	240	9.49
5 or More People	Q	9.96	10.65	14.18	Q	241	314	371	19.28
Age of Household Head									
Less than 25 Years	9.53	Q	Q	13.56	88	Q	Q	248	14.35
25 to 59 Years	7.74	9.83	11.50	13.84	213	239	222	232	10.88
60 Years or Older	8.62	11.88	11.53	12.18	109	130	272	329	15.56

See footnotes at end of table.

Table 28. Average Residential Prices and Expenditures for Liquefied Petroleum Gas, 1978 Through 1984 (Continued)

North Central

Household Characteristics	Fuel Price (Dollars per Million Btu)				Expenditures (Dollars per Household)				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	0.91	0.42	0.56	0.64	2.04	1.51	1.62	1.46	
All Households	$4.55	$7.38	$8.44	$8.67	$362	$540	$510	$604	4.19
Census Division									
East North Central	--	7.63	8.93	9.09	--	569	498	615	3.78
West North Central	--	7.02	7.86	8.13	--	502	526	589	5.12
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	Q	7.40	8.68	8.98	Q	495	493	559	8.28
5,500 to 7,000 HDD	Q	7.50	8.18	8.23	Q	588	602	762	6.91
4,000 to 5,499 HDD	4.25	7.24	8.40	8.69	326	545	447	560	7.78
Year of Construction									
Before 1950	4.61	7.24	8.40	8.60	377	498	453	553	6.16
1950 to 1974	4.55	7.54	8.46	8.74	333	624	541	639	6.25
After 1974	Q	7.27	8.47	8.54	Q	451	592	605	D
Main Space Heating Fuel									
Electricity	Q	Q	Q	Q	Q	Q	Q	Q	Q
Natural Gas	--	--	--	Q	--	--	--	Q	Q
Fuel Oil/Kerosene	6.21	9.17	11.29	12.17	148	97	121	67	16.65
LPG	4.30	7.28	8.21	8.59	548	793	750	765	3.38
Wood	Q	7.68	9.01	8.86	Q	268	232	372	8.44
Other or None	Q	Q	--	--	Q	Q	--	--	Q
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	7.55	8.80	9.21	--	447	357	550	6.88
1,000 to 1,999	--	7.33	8.64	8.64	--	482	523	567	4.40
2,000 or More	--	7.31	8.07	8.07	--	718	611	787	5.80
Air Conditioning									
Yes	4.33	7.16	8.21	8.38	433	562	559	737	5.95
No	4.72	7.52	8.72	8.95	323	528	462	523	5.40
Main Water Heating Fuel									
Electricity	4.27	7.56	8.72	9.13	402	405	389	525	6.73
Natural Gas	--	--	--	Q	--	--	--	Q	Q
Fuel Oil/Kerosene	Q	Q	--	--	Q	Q	--	--	Q
LPG	4.78	7.31	8.27	8.45	364	638	640	656	4.21
Other or None	Q	6.83	Q	--	Q	405	Q	--	14.81
Ownership Status									
Own	4.53	7.36	8.42	8.76	370	555	518	602	4.35
Rent	4.62	7.50	8.77	8.21	Q	472	408	619	10.46
Annual Family Income									
Under $10,000	4.55	7.44	8.73	9.18	297	420	557	655	6.42
$10,000 to $19,999	4.94	7.51	8.65	8.67	382	461	320	536	6.49
$20,000 to $29,999	Q	7.41	8.09	8.39	Q	828	762	582	10.26
$30,000 or More	Q	7.07	8.32	8.02	Q	707	552	642	7.34
Number of People in Household									
Single Person	3.96	7.45	8.56	8.82	Q	468	528	578	9.64
2 to 4 People	4.74	7.43	8.37	8.62	336	512	450	636	5.59
5 or More People	4.55	7.19	8.51	8.83	469	706	689	396	8.24
Age of Household Head									
Less than 25 Years	Q	7.49	Q	9.20	Q	507	Q	563	10.89
25 to 59 Years	4.66	7.39	8.41	8.42	430	579	505	563	5.35
60 Years or Older	4.31	7.33	8.46	9.03	258	473	574	675	6.76

See footnotes at end of table.

Table 28. Average Residential Prices and Expenditures for Liquefied Petroleum Gas, 1978 Through 1984 (Continued)

South

Household Characteristics	Fuel Price (Dollars per Million Btu)				Expenditures (Dollars per Household)				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	0.91	0.42	0.56	0.64	2.04	1.51	1.62	1.46	
All Households	$5.16	$8.12	$9.82	$10.38	$211	$337	$334	$334	4.12
Census Division									
South Atlantic	--	8.44	10.51	11.59	--	311	305	287	5.70
East South Central	--	7.70	9.29	9.75	--	389	323	348	5.17
West South Central	--	7.59	8.92	8.99	--	393	423	457	8.09
Weather Zone									
Fewer than 2,000 CDD and--									
5,500 to 7,000 HDD	Q	--	--	--	Q	--	--	--	Q
4,000 to 5,499 HDD	6.23	9.34	10.85	11.91	145	231	302	278	9.06
Fewer than 4,000 HDD	5.04	7.93	9.50	9.58	222	363	374	426	5.24
More than 2,000 CDD and									
Fewer than 4,000 HDD	5.11	8.02	9.80	11.01	221	357	313	278	6.49
Year of Construction									
Before 1950	5.14	8.09	9.72	10.14	185	368	374	388	5.47
1950 to 1974	5.23	8.22	10.07	11.51	221	322	300	259	4.41
After 1974	Q	7.79	9.29	9.25	Q	320	346	436	D
Main Space Heating Fuel									
Electricity	5.69	8.16	11.93	13.19	94	239	122	196	16.85
Natural Gas	Q	Q	--	Q	Q	Q	--	Q	Q
Fuel Oil/Kerosene	7.65	9.91	13.39	14.81	111	146	160	187	8.29
LPG	4.83	7.88	9.45	9.87	279	458	409	429	3.90
Wood	4.86	8.74	10.54	10.74	161	206	272	247	7.04
Other or None	Q	Q	Q	Q	Q	Q	Q	Q	Q
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	8.21	10.07	11.32	--	319	303	280	5.97
1,000 to 1,999	--	8.10	9.64	9.70	--	356	369	402	6.17
2,000 or More	--	7.84	9.59	11.29	--	362	333	240	15.97
Air Conditioning									
Yes	5.04	8.05	9.74	10.44	216	314	329	310	4.64
No	5.39	8.19	9.93	10.30	201	367	341	371	5.86
Main Water Heating Fuel									
Electricity	5.11	8.54	10.25	11.03	175	259	274	276	5.64
Natural Gas	--	Q	--	Q	--	Q	--	Q	Q
Fuel Oil/Kerosene	7.86	Q	Q	Q	227	Q	Q	Q	10.31
LPG	5.13	7.76	9.49	9.81	268	479	426	439	5.41
Other or None	Q	8.40	Q	Q	Q	283	Q	Q	27.94
Ownership Status									
Own	5.08	8.07	9.74	10.40	225	343	322	324	4.93
Rent	5.44	8.29	9.99	10.33	171	319	362	357	7.15
Annual Family Income									
Under $10,000	5.51	8.20	9.88	10.33	206	300	342	338	5.43
$10,000 to $19,999	4.95	8.17	9.68	10.72	215	395	366	323	5.44
$20,000 to $29,999	4.73	7.80	9.99	9.86	217	374	311	378	8.36
$30,000 or More	Q	8.10	9.87	10.34	Q	277	225	304	13.53
Number of People in Household									
Single Person	5.12	8.51	10.39	10.78	211	335	381	314	8.95
2 to 4 People	5.17	8.04	9.64	10.72	206	324	312	305	4.41
5 or More People	5.14	8.11	9.69	9.11	246	432	380	516	9.14
Age of Household Head									
Less than 25 Years	5.60	7.89	9.89	Q	205	369	301	Q	11.80
25 to 59 Years	5.03	8.11	9.80	10.19	219	326	328	343	3.83
60 Years or Older	5.22	8.22	9.85	10.73	198	348	348	317	7.16

See footnotes at end of table.

Table 28. Average Residential Prices and Expenditures for Liquefied Petroleum Gas, 1978 Through 1984 (Continued)

West

Household Characteristics	Fuel Price (Dollars per Million Btu)				Expenditures (Dollars per Household)				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	0.91	0.42	0.56	0.64	2.04	1.51	1.62	1.46	
All Households	$4.18	$7.91	$9.68	$10.56	$278	$391	$413	$417	5.95
Census Division									
Mountain	--	7.21	8.63	9.26	---	487	504	453	4.36
Pacific	--	9.09	11.49	11.36	---	310	335	400	10.81
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	--	7.04	8.35	8.99	---	477	589	470	7.14
5,500 to 7,000 HDD	3.93	7.48	8.88	9.80	374	486	450	482	6.35
4,000 to 5,499 HDD	Q	7.24	9.11	10.16	Q	352	316	251	23.73
Fewer than 4,000 HDD	Q	8.10	8.99	10.84	Q	314	309	422	11.84
More than 2,000 CDD and Fewer than 4,000 HDD	Q	11.56	15.80	12.41	Q	338	391	367	10.07
Year of Construction									
Before 1950	Q	8.23	10.06	10.21	Q	323	305	428	11.20
1950 to 1974	4.26	7.63	9.58	11.42	238	372	465	401	14.56
After 1974	Q	8.28	9.56	9.90	Q	482	461	429	D
Main Space Heating Fuel									
Electricity	Q	8.03	Q	Q	Q	239	Q	Q	11.91
Natural Gas	--	Q	--	Q	--	Q	--	Q	Q
Fuel Oil/Kerosene	Q	Q	Q	Q	Q	Q	Q	Q	Q
LPG	3.94	7.39	8.59	9.76	383	531	561	536	6.30
Wood	Q	7.72	9.25	12.22	Q	269	268	310	8.42
Other or None	--	11.32	16.38	12.75	--	338	356	341	11.48
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	8.22	10.81	11.02	---	360	386	419	10.09
1,000 to 1,999	--	7.28	9.01	9.93	--	504	409	434	10.78
2,000 or More	--	8.08	8.51	10.49	---	348	500	347	18.39
Air Conditioning									
Yes	3.56	8.02	9.06	10.36	Q	400	469	438	11.46
No	5.27	7.86	9.78	10.71	194	386	406	404	7.48
Main Water Heating Fuel									
Electricity	4.24	7.79	8.96	10.38	255	298	287	370	9.77
Natural Gas	--	Q	—	Q	---	Q	—	Q	Q
Fuel Oil/Kerosene	--	Q	12.96	--	--	Q	213	--	16.40
LPG	Q	7.93	9.68	10.50	Q	413	468	449	5.96
Other or None	--	--	Q	Q	--	--	Q	Q	Q
Ownership Status									
Own	4.31	7.67	9.49	10.98	305	398	415	393	8.83
Rent	Q	8.64	10.02	9.93	Q	371	410	464	8.98
Annual Family Income									
Under $10,000	4.34	7.76	10.28	10.02	188	348	329	445	13.79
$10,000 to $19,999	4.03	8.25	9.19	10.97	Q	341	508	450	7.66
$20,000 to $29,999	Q	7.61	8.89	10.79	Q	509	402	353	12.99
$30,000 or More	Q	8.30	10.67	10.48	Q	454	379	386	16.03
Number of People in Household									
Single Person	Q	7.63	9.85	Q	Q	375	256	Q	8.13
2 to 4 People	4.14	7.68	9.62	11.16	301	370	406	386	6.48
5 or More People	Q	8.96	9.76	10.34	Q	478	563	485	11.39

See footnotes at end of table.

Table 28. Average Residential Prices and Expenditures for Liquefied Petroleum Gas, 1978 Through 1984 (Continued)

West

Household Characteristics	Fuel Price (Dollars per Million Btu)				Expenditures (Dollars per Household)				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	0.91	0.42	0.56	0.64	2.04	1.51	1.62	1.46	
Age of Household Head									
Less than 25 Years	Q	Q	Q	Q	Q	Q	Q	Q	Q
25 to 59 Years	4.26	7.99	9.63	10.19	287	409	458	422	6.92
60 Years or Older	Q	7.76	9.78	11.79	Q	345	322	405	9.55

-- Data not applicable or not available.
[D] The RSEs calculated using the row and column factors are unreliable. Reliable RSE estimates for each cell are found in Appendix A.
[Q] Data withheld due to large variance (1.96 * standard error > value).
Note: To obtain a Relative Standard Error Percent (RSE) for any table cell, multiply the cell's corresponding column and row factors.
See Glossary for definition of terms used in this report.
Data may not sum to totals because of rounding.
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

Detailed Statistics

Table 29. Counts of U.S. Households Using Liquefied Petroleum Gas, 1978 Through 1984

United States

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.49	1.03	1.16	1.02	1.12	0.75	0.83	0.79	
All Households	6.9	7.7	7.3	7.8	100.0%	100.0%	100.0%	100.0%	B
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	Q	1.3	1.4	1.5	Q	17.4	19.0	19.2	38.72
5,500 to 7,000 HDD	1.4	1.4	1.3	1.1	20.1	18.6	17.6	14.5	20.12
4,000 to 5,499 HDD	1.7	1.6	1.3	1.6	24.8	20.9	18.3	20.0	27.77
Fewer than 4,000 HDD	1.8	1.8	1.6	1.8	26.8	23.0	21.6	22.9	27.59
More than 2,000 CDD and Fewer than 4,000 HDD	1.5	1.5	1.7	1.8	21.9	20.0	23.5	23.4	19.25
Year of Construction									
Before 1950	2.5	3.0	3.1	2.8	36.8	38.9	41.8	36.3	13.02
1950 to 1974	4.0	3.6	3.3	3.8	58.3	47.6	45.1	48.8	9.16
After 1974	.3	1.0	1.0	1.2	4.9	13.6	13.0	15.0	D
Main Space Heating Fuel									
Electricity	.3	.5	.3	.5	4.7	6.7	4.5	6.5	23.59
Natural Gas	Q	Q	Q	Q	Q	Q	Q	Q	Q
Fuel Oil/Kerosene	2.4	1.8	1.5	1.3	35.1	23.1	20.1	16.9	15.71
LPG	3.1	3.7	3.8	3.9	45.2	48.3	51.7	49.7	9.55
Wood	.8	1.4	1.5	1.7	11.2	18.5	19.9	22.0	17.64
Other or None	Q	.2	.3	.3	Q	3.2	3.6	3.4	24.40
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	3.4	3.0	3.7	--	44.2	41.7	47.6	10.02
1,000 to 1,999	--	2.8	3.0	3.1	--	35.9	40.3	39.8	11.21
2,000 or More	--	1.5	1.3	1.0	--	19.9	18.0	12.6	16.83
Air Conditioning									
Yes	3.5	3.4	3.2	3.8	51.3	43.9	44.2	48.3	9.97
No	3.4	4.3	4.1	4.1	48.7	56.1	55.8	51.7	9.56
Main Water Heating Fuel									
Electricity	3.2	3.3	3.3	3.4	46.4	43.6	44.5	43.3	9.44
Natural Gas	Q	Q	Q	Q	Q	Q	Q	Q	Q
Fuel Oil/Kerosene	.4	.5	.4	.3	5.8	6.2	4.8	3.6	28.16
LPG	3.1	3.6	3.5	3.8	44.9	46.5	47.3	49.0	9.18
Other or None	.2	Q	.2	.2	2.2	3.2	3.3	2.5	38.00
Ownership Status									
Own	5.3	6.0	5.5	5.9	76.1	78.4	75.7	75.2	6.30
Rent	1.7	1.7	1.8	1.9	23.9	21.6	24.3	24.8	14.55
Annual Family Income									
Under $10,000	3.1	2.8	2.7	2.8	45.1	36.9	36.3	35.4	10.53
$10,000 to $19,999	2.4	2.7	2.3	2.4	34.5	34.9	31.9	30.3	9.84
$20,000 to $29,999	1.0	1.2	1.2	1.4	14.4	15.8	16.2	17.5	13.36
$30,000 or More	.4	.9	1.1	1.3	6.0	12.4	15.7	16.8	17.93
Number of People in Household									
Single Person	1.1	1.2	1.5	1.7	16.5	15.1	20.6	21.8	14.42
2 to 4 People	4.8	5.5	4.7	5.2	70.1	71.2	64.4	65.9	6.65
5 or More People	.9	1.0	1.1	1.0	13.4	13.7	15.0	12.3	14.98
Age of Household Head									
Less than 25 Years	.8	.6	.4	.3	11.8	7.7	5.2	3.8	26.48
25 to 59 Years	4.2	4.8	4.6	4.8	61.0	62.2	63.0	61.8	7.03
60 Years or Older	1.9	2.3	2.3	2.7	27.2	30.1	31.8	34.4	10.73

See footnotes at end of table.

Table 29. Counts of U.S. Households Using Liquefied Petroleum Gas, 1978 Through 1984 (Continued)

Northeast

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.49	1.03	1.16	1.02	1.12	0.75	0.83	0.79	
All Households	1.3	1.3	1.1	1.4	100.0%	100.0%	100.0%	100.0%	B
Census Division									
New England	--	.5	.5	.5	--	42.6	40.4	36.0	25.87
Middle Atlantic	--	.7	.7	.9	--	57.4	59.6	64.0	25.21
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	Q	Q	Q	Q	Q	35.4	42.8	37.3	60.41
5,500 to 7,000 HDD	Q	.6	.5	.6	44.2	48.0	45.9	42.2	34.58
4,000 to 5,499 HDD	.5	.2	.1	.3	Q	Q	Q	20.5	52.23
Year of Construction									
Before 1950	.7	.7	Q	.6	51.7	51.7	48.7	47.5	28.35
1950 to 1974	.6	.5	.5	.6	45.9	39.6	45.1	44.6	24.36
After 1974	Q	.1	Q	Q	Q	8.7	Q	7.8	D
Main Space Heating Fuel									
Electricity	Q	Q	Q	Q	Q	4.6	Q	Q	71.39
Natural Gas	Q	Q	Q	--	Q	Q	Q	--	Q
Fuel Oil/Kerosene	1.1	.8	.6	.8	86.2	62.9	49.0	57.8	17.67
LPG	.1	Q	Q	.2	Q	Q	17.1	11.9	43.39
Wood	Q	.2	.3	Q	Q	19.5	25.1	Q	46.56
Other or None	Q	--	.1	.1	Q	--	5.0	4.0	41.77
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	.4	.4	.6	--	31.2	37.3	47.0	23.90
1,000 to 1,999	--	.5	.4	.4	--	37.0	35.8	27.7	24.92
2,000 or More	--	.4	.3	.3	--	31.8	27.0	25.3	27.65
Air Conditioning									
Yes	.5	.4	.3	.5	39.4	27.9	25.9	35.2	23.85
No	.8	.9	.8	.9	60.6	72.1	74.1	64.8	19.27
Main Water Heating Fuel									
Electricity	.4	.6	.4	.5	31.1	44.0	39.2	38.7	26.79
Natural Gas	Q	Q	Q	--	Q	Q	Q	--	Q
Fuel Oil/Kerosene	.3	.4	.3	.3	23.0	27.7	23.6	18.6	31.02
LPG	.6	.3	.4	.5	42.3	26.1	33.5	39.0	25.78
Other or None	--	Q	Q	Q	--	Q	Q	Q	Q
Ownership Status									
Own	1.0	1.0	.9	1.0	76.6	82.6	81.5	76.0	13.65
Rent	.3	.2	.2	.3	23.4	17.4	18.5	24.0	29.19
Annual Family Income									
Under $10,000	.4	.3	.4	.4	33.9	22.3	34.0	31.2	27.72
$10,000 to $19,999	.5	.5	Q	.3	37.2	42.9	28.4	23.0	29.40
$20,000 to $29,999	Q	.3	.2	.3	20.9	22.0	17.5	20.9	30.73
$30,000 or More	Q	.2	.2	.3	8.0	12.8	20.1	24.9	36.22
Number of People in Household									
Single Person	.2	Q	Q	.3	17.8	13.4	27.5	22.3	32.76
2 to 4 People	.9	.9	.6	.8	70.2	73.1	56.2	62.3	15.88
5 or More People	Q	.2	.2	.2	Q	13.5	16.3	15.4	34.43
Age of Household Head									
Less than 25 Years	Q	.1	Q	.1	Q	5.1	Q	10.2	48.34
25 to 59 Years	.8	.9	.7	.8	64.7	69.1	60.3	58.4	17.21
60 Years or Older	.4	.3	Q	.4	29.7	25.8	34.7	31.4	28.74

See footnotes at end of table.

Table 29. Counts of U.S. Households Using Liquefied Petroleum Gas, 1978 Through 1984 (Continued)

North Central

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.49	1.03	1.16	1.02	1.12	0.75	0.83	0.79	
All Households	1.5	2.1	1.8	1.9	100.0%	100.0%	100.0%	100.0%	B
Census Division									
East North Central	--	1.2	1.0	1.1	--	57.5	58.4	58.1	19.64
West North Central	--	.9	.7	.8	--	42.5	41.6	41.9	22.82
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	Q	.7	.8	.9	Q	35.5	43.2	46.3	52.24
5,500 to 7,000 HDD	Q	.6	.5	.4	Q	30.4	27.9	22.2	35.60
4,000 to 5,499 HDD	.7	Q	Q	.6	50.4	34.2	Q	31.5	44.54
Year of Construction									
Before 1950	.8	1.0	.8	.7	52.1	47.1	44.5	37.2	18.92
1950 to 1974	.7	.8	.7	1.1	45.4	39.0	40.5	54.9	22.48
After 1974	Q	.3	.3	.2	Q	13.9	15.0	7.8	D
Main Space Heating Fuel									
Electricity	Q	Q	Q	Q	Q	Q	Q	Q	Q
Natural Gas	--	--	--	Q	--	--	--	Q	Q
Fuel Oil/Kerosene	.5	.3	.4	.1	32.1	14.6	21.6	6.6	28.93
LPG	.8	1.2	1.0	1.3	52.8	57.4	53.2	64.7	12.30
Wood	Q	.5	.4	.5	Q	24.7	21.1	26.5	32.22
Other or None	Q	.0	--	--	Q	1.0	--	--	38.13
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	.6	.5	.8	--	30.0	25.1	39.3	22.92
1,000 to 1,999	--	.8	.8	.8	--	40.9	42.8	40.7	13.08
2,000 or More	--	.6	.6	.4	--	29.1	32.1	20.1	25.89
Air Conditioning									
Yes	.5	.8	.9	.7	35.3	37.0	49.1	37.9	22.86
No	1.0	1.3	.9	1.2	64.7	63.0	50.9	62.1	17.38
Main Water Heating Fuel									
Electricity	.6	.8	.9	.7	38.9	38.3	49.9	38.4	14.15
Natural Gas	--	--	--	Q	--	--	--	Q	Q
Fuel Oil/Kerosene	Q	Q	--	--	Q	Q	--	--	Q
LPG	.8	1.2	.9	1.2	55.8	59.4	49.2	60.8	13.00
Other or None	Q	.0	Q	--	Q	1.4	Q	--	63.08
Ownership Status									
Own	1.2	1.7	1.7	1.7	83.9	83.0	92.4	85.4	7.87
Rent	.2	.4	.1	.3	16.1	17.0	7.6	14.6	24.01
Annual Family Income									
Under $10,000	.6	.7	.5	.7	41.8	31.8	25.9	34.8	19.17
$10,000 to $19,999	.6	.8	.6	.6	38.6	37.8	34.0	28.7	16.16
$20,000 to $29,999	.2	.3	.3	.4	10.3	14.6	16.7	20.3	24.31
$30,000 or More	.1	.3	.4	.3	9.3	15.8	23.4	16.3	29.56
Number of People in Household									
Single Person	.3	.2	.3	.4	18.1	11.5	15.6	21.5	23.32
2 to 4 People	.8	1.5	1.2	1.4	57.0	71.3	64.5	70.4	11.21
5 or More People	.4	.4	.4	.2	24.9	17.1	19.9	8.1	22.93
Age of Household Head									
Less than 25 Years	Q	.1	Q	.0	Q	6.6	6.2	2.2	45.74
25 to 59 Years	.9	1.3	1.2	1.2	61.3	61.4	68.1	60.8	12.66
60 Years or Older	.5	.7	.5	.7	31.5	32.0	25.7	37.0	20.92

See footnotes at end of table.

Table 29. Counts of U.S. Households Using Liquefied Petroleum Gas, 1978 Through 1984 (Continued)

South

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.49	1.03	1.16	1.02	1.12	0.75	0.83	0.79	
All Households	3.7	3.5	3.5	3.7	100.0%	100.0%	100.0%	100.0%	B
Census Division									
South Atlantic	--	2.4	2.2	2.3	--	67.2	62.8	63.2	17.45
East South Central	--	.5	.5	.5	--	15.7	14.3	14.6	30.90
West South Central	--	.6	.8	.8	--	17.1	22.9	22.2	30.70
Weather Zone									
Fewer than 2,000 CDD and--									
5,500 to 7,000 HDD	Q	--	--	--	Q	--	--	--	Q
4,000 to 5,499 HDD	.4	.6	Q	.6	Q	17.7	Q	17.3	47.50
Fewer than 4,000 HDD	1.8	1.5	1.4	1.4	48.6	42.5	38.4	37.7	29.49
More than 2,000 CDD and Fewer than 4,000 HDD	1.4	1.4	1.5	1.7	38.8	39.8	43.4	45.0	20.59
Year of Construction									
Before 1950	1.0	1.2	1.4	1.3	26.3	33.8	40.9	34.5	19.98
1950 to 1974	2.5	1.9	1.7	1.8	68.8	53.7	49.4	48.4	12.42
After 1974	.2	.4	.3	.6	4.9	12.4	9.8	17.1	D
Main Space Heating Fuel									
Electricity	.2	.3	.2	.3	4.8	8.6	6.0	9.2	31.70
Natural Gas	Q	Q	--	Q	Q	Q	--	Q	Q
Fuel Oil/Kerosene	.8	.7	.5	.4	21.8	18.6	13.9	10.2	31.71
LPG	2.0	2.0	2.3	2.1	54.1	56.7	64.3	56.3	12.81
Wood	.5	.5	.5	.8	14.3	13.2	15.2	21.2	25.37
Other or None	Q	Q	Q	Q	Q	Q	Q	Q	Q
Measured Heated Area of Residence (square feet)									
Less than 1,000	--	1.8	1.7	1.8	--	52.2	48.7	50.3	15.57
1,000 to 1,999	--	1.3	1.5	1.7	--	35.8	43.5	45.2	17.78
2,000 or More	--	.4	.3	.2	--	12.0	7.8	4.4	34.40
Air Conditioning									
Yes	2.4	2.0	2.0	2.2	63.9	56.3	55.6	61.1	12.05
No	1.3	1.5	1.6	1.4	36.1	43.7	44.4	38.9	16.75
Main Water Heating Fuel									
Electricity	2.0	1.9	1.8	1.9	53.5	52.9	50.7	52.5	13.97
Natural Gas	--	Q	--	Q	--	Q	--	Q	Q
Fuel Oil/Kerosene	.1	Q	Q	Q	Q	Q	Q	Q	70.66
LPG	1.5	1.3	1.5	1.5	41.6	37.8	43.4	41.0	18.39
Other or None	Q	Q	.2	Q	3.2	Q	4.3	3.3	49.72
Ownership Status									
Own	2.7	2.7	2.4	2.6	73.8	75.8	68.5	71.6	9.73
Rent	1.0	.8	1.1	1.0	26.2	24.2	31.5	28.4	20.96
Annual Family Income									
Under $10,000	1.9	1.6	1.5	1.4	50.6	44.8	43.9	39.1	15.31
$10,000 to $19,999	1.2	1.1	1.1	1.2	33.0	31.6	30.9	33.1	14.57
$20,000 to $29,999	.5	.5	.6	.5	13.3	13.5	16.8	13.8	21.09
$30,000 or More	.1	.4	.3	.5	3.1	10.1	8.5	14.0	33.85
Number of People in Household									
Single Person	.6	.5	.8	.8	16.6	15.5	22.0	21.8	22.33
2 to 4 People	2.7	2.6	2.4	2.4	73.5	73.7	67.4	65.7	10.08
5 or More People	.4	.4	.4	.5	9.9	10.7	10.6	12.5	25.86
Age of Household Head									
Less than 25 Years	Q	.3	.2	.1	15.6	9.9	4.9	2.8	39.71
25 to 59 Years	2.1	2.1	2.1	2.2	57.1	58.6	58.6	61.0	12.10
60 Years or Older	1.0	1.1	1.3	1.3	27.3	31.5	36.5	36.2	16.70

See footnotes at end of table.

Table 29. Counts of U.S. Households Using Liquefied Petroleum Gas, 1978 Through 1984 (Continued)

West

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.49	1.03	1.16	1.02	1.12	0.75	0.83	0.79	
All Households	0.4	0.8	0.9	0.9	100.0%	100.0%	100.0%	100.0%	B
Census Division									
Mountain	—	.4	.4	.3	—	45.7	46.3	30.7	23.94
Pacific	—	.4	.5	.6	—	54.3	53.7	69.3	20.95
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	—	.1	.1	Q	—	18.4	15.2	Q	45.74
5,500 to 7,000 HDD	.2	.2	.3	.1	Q	23.1	30.6	15.5	25.99
4,000 to 5,499 HDD	Q	Q	.1	.0	Q	Q	6.0	5.4	54.38
Fewer than 4,000 HDD	Q	.3	Q	.4	Q	34.1	25.8	46.8	52.70
More than 2,000 CDD and Fewer than 4,000 HDD	Q	.1	.2	.2	Q	16.5	22.4	20.3	27.56
Year of Construction									
Before 1950	Q	.2	.3	.2	Q	19.2	31.4	24.4	33.51
1950 to 1974	.2	.4	.3	.4	50.1	55.5	37.6	43.0	30.51
After 1974	Q	.2	.3	.3	21.2	25.3	31.0	32.6	Q
Main Space Heating Fuel									
Electricity	Q	.1	Q	.1	Q	12.8	Q	7.2	46.36
Natural Gas	—	Q	—	Q	—	Q	—	Q	Q
Fuel Oil/Kerosene	Q	Q	Q	Q	Q	Q	Q	Q	Q
LPG	Q	.4	.4	.4	59.6	44.5	43.2	47.2	25.40
Wood	Q	.2	.3	.2	Q	23.6	29.4	18.9	38.42
Other or None	—	.1	.2	.2	—	17.2	21.3	20.3	19.63
Measured Heated Area of Residence (square feet)									
Less than 1,000	—	.5	.5	.5	—	66.6	53.0	55.6	21.54
1,000 to 1,999	—	.2	.2	.3	—	22.1	28.3	33.8	32.92
2,000 or More	—	.1	.2	.1	—	11.3	18.6	10.6	42.39
Air Conditioning									
Yes	Q	.3	.1	.3	Q	33.0	11.5	38.4	32.47
No	.3	.5	.8	.5	65.4	67.0	88.5	61.6	16.44
Main Water Heating Fuel									
Electricity	.3	.1	.1	.2	57.3	16.1	14.8	23.2	27.74
Natural Gas	—	Q	—	Q	—	Q	—	Q	Q
Fuel Oil/Kerosene	—	Q	.0	—	—	Q	3.3	—	62.10
LPG	Q	.7	.7	.6	42.7	82.9	76.7	71.6	13.73
Other or None	—	—	Q	Q	—	—	Q	Q	Q
Ownership Status									
Own	.3	.6	.5	.6	68.1	71.2	62.6	66.7	21.87
Rent	Q	.2	.3	.3	Q	28.8	37.4	33.3	35.21
Annual Family Income									
Under $10,000	.2	.3	.3	.2	42.8	38.4	30.0	27.7	29.71
$10,000 to $19,999	.1	.2	.3	.3	24.7	29.5	36.5	33.4	24.48
$20,000 to $29,999	Q	.2	.1	.2	Q	19.5	10.8	21.5	34.58
$30,000 or More	Q	.1	.2	.2	Q	12.7	22.7	17.4	34.51
Number of People in Household									
Single Person	Q	.2	.1	.2	Q	25.2	16.7	21.7	39.06
2 to 4 People	.4	.5	.5	.6	85.0	57.0	62.6	62.3	13.72
5 or More People	Q	.1	.2	.1	Q	17.8	20.7	16.0	27.82

See footnotes at end of table.

Table 29. Counts of U.S. Households Using Liquefied Petroleum Gas, 1978 Through 1984 (Continued)

West

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.49	1.03	1.16	1.02	1.12	0.75	0.83	0.79	
Age of Household Head									
Less than 25 Years	Q	Q	Q	Q	Q	Q	Q	Q	Q
25 to 59 Years	0.4	0.6	0.6	0.6	82.0	69.1	73.6	72.4	13.63
60 Years or Older	Q	.2	.2	.2	Q	25.4	22.1	26.0	38.00

-- Data not applicable or not available.

[B] The RSEs for Percent of Households values given in this row are 0.0. The RSE Row Factor for Millions of Households values is 8.72 for United States totals, 22.54 for Northeast Census Region totals, 15.23 for North Central Census Region totals, 14.18 for South Census Region totals and 18.27 for West Census Region totals.

[D] The RSEs calculated using the row and column factors are unreliable. Reliable RSE estimates for each cell are found in Appendix A.

[Q] Data withheld due to large variance (1.96 * standard error > value).

Note: To obtain a Relative Standard Error Percent (RSE) for any table cell, multiply the cell's corresponding column and row factors.
See Glossary for definition of terms used in this report.
Data may not sum to totals because of rounding.
Percentages are calculated on unrounded numbers.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

Appendix A

Quality of the Data

Appendix A
Quality of the Data
Introduction

The data presented in this report are based on six national surveys of occupied residential housing units and their fuel suppliers. These Residential Energy Consumption Surveys (RECS) were conducted in a similar fashion, and thus, it is meaningful to compare the results from the different surveys. Examining the six RECS as a series gives data on trends in residential use of energy during the 7-year period 1978 through 1984. (A RECS was not fielded in 1983). Beginning in 1984, the survey is to be conducted every 3 years.

Data from each RECS are subject to many sources of sampling error, nonsampling error, and bias. Sampling error is a measure of the data variability that results from surveying a sample, rather than the entire population. Because each RECS used probability sampling techniques, sampling errors of the survey estimates can be estimated and used as a guide in making inferences from the sample estimates to the total population.

Nonsampling error and bias are measures of variability because of the conduct of the surveys. They can include population undercoverage during sampling, response bias and variance, interviewer error, coding and/or keypunching error, and nonresponse bias. 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. In addition, response adjustments and ratio estimation techniques were incorporated into the survey estimation procedures to help reduce both sampling and nonsampling error.

The six surveys are listed below along with a reference for details on how each individual survey was run, including details of the procedures to control nonsampling error.

Survey Year	Reference
1978	RECS: Consumption and Expenditures, April 1978 Through March 1979; July 1980, DOE/EIA-0207/5, GPO Stock No. 061-003-00189-1, $8.50.
1979	RECS: Consumption and Expenditures, Part 1: National Data (Including Conservation); April 1981, DOE/EIA-262/1, GPO Stock No. 061-003-00191-2, $6.50.
1980	RECS: 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.
1981	RECS: Consumption and Expenditures, April 1981 Through March 1982, Part 1: National Data; September 1983, DOE/EIA-0321/1(81), GPO Stock No. 061-003-00340-1, $6.00.
1982	RECS: Consumption and Expenditures, April 1982 Through March 1983, Part 1: National Data; November 1984, DOE/EIA-0321/1(82), GPO Stock No. 061-003-00411-3, $7.00.
1984	RECS: 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.

Appendix A

This appendix summarizes the similarities and differences of the six Residential Energy Consumption Surveys with respect to survey design, data collection, and data processing. Additionally, a discussion of the effect of the changes in the survey procedures on the estimates obtained from the survey data is presented. Finally, the method for obtaining estimates of sampling errors for the survey results and the impact of the similarities of the six survey designs on the sampling errors for estimates of change across surveys are described.

Survey Design

For all six surveys, the sample households were selected using a multiple-stage area-probability sampling design that was similar in nature, however, there were some differences. The 1978 and 1979 surveys used a sampling design that was a general purpose design. The 1980, 1981, 1982, and 1984 surveys used a sampling design especially created for the Residential Energy Consumption Surveys. This design was adjusted prior to the 1984 survey to reflect the results of the 1980 Census and to reflect changes in EIA's requirements for precision.

Generally, the design for the surveys can be broken into two groups: Group 1 is composed of the 1978 and 1979 surveys and Group 2 is composed of the 1980, 1981, 1982, and 1984 surveys. For Group 2, the cluster size was smaller (4, rather than 10 for Group 1), more Primary Sampling Units (PSU) were used (131 in 1980, 1981, and 1982, and 129 in 1984, rather than 103 for Group 1), and greater stratification was used that incorporated information related to energy use (main heating fuel and weather).[16] These procedures, along with a somewhat larger sample size, contributed to a reduced sampling error for Group 2.

Universe for Surveys

For all six surveys, the universe included all occupied residential housing units. Group housing units such as college dormitories, military barracks and hotels were not in the universe. Also excluded from the universe were unoccupied housing units, second homes, and units that are occupied fewer than 6 months annually. For the 1978 and 1979 surveys, this universe was restricted to occupied residential housing units in the 48 contiguous States and the District of Columbia minus all housing units on military bases. The universe for the surveys was expanded in 1980. Occupied residential housing units in Alaska and Hawaii were added to the sample, as were occupied residential housing units (apart from barracks) on military bases in any of the 50 States and the District of Columbia.

By Census definition, the number of occupied residential housing units equals the number of households. Estimates of the total number of occupied residential housing units were derived from Current Population Survey (CPS) figures on the number of households by interpolating from March (the date of the CPS figures) to November (the date of the RECS). There was a discontinuous increase in these

[16] The sample for the 1984 survey can be divided into two panels (incoming panel and longitudinal panel). There were 129 PSU's for the incoming panel and 131 PSU's for the longitudinal panel.

Appendix A

CPS figures when adjustments from the 1980 Census were incorporated into the estimating procedure. The number of households counted in the 1980 Census was larger than had been expected in the CPS estimates before the 1980 Census. Therefore, the total count of households in the series of RECS does not increase evenly (Table A1). The 1978 and 1979 population estimates have not been corrected to adjust for the underestimation of about 4 percent revealed by the 1980 Census and by the change in the universe. The underestimates of the size of the universe for 1978 and 1979 affect aggregate consumption and expenditures data for these surveys, but these data are not included in this report. This report focuses on average consumption and expenditures per household. These data are affected little by the jump in population size. In this report, the household counts for 1978 and 1979 are included and the underestimation of these numbers has not been corrected. The following table lists the universe size and the sample size for each of the six surveys.

Table A1. Size of Sample and Increase in Universe Size for the Six Residential Energy Consumption Surveys

Survey Year	Sample Size	Universe Size	Increase in Estimated Size of Universe (Percent Annual Increase)
1978	4,081	76,608,000	-
1979	4,033	77,524,000	1.2
1980	6,051	81,645,000	5.3
1981	6,269	83,141,000	1.8
1982	4,724	83,788,000	0.8*
1984	5,682	86,328,000	1.5

*Calculated on an annual basis

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, The Residential Energy Consumption Surveys, 1978, 1979, 1980, 1982, and 1984.

The housing units included in the 1978, 1979, and 1981 surveys were sampled only once. The sample for the 1980, 1982, and 1984 surveys can each be divided into two panels. Any of the panels for these three surveys can be used as a full national sample in itself, by adjusting the weights of the housing units. For each survey, the two panels can be denoted as the incoming panel and the longitudinal panel. The incoming panel for any survey and the longitudinal panel for the 1980 survey contains only housing units that have never been sampled for a RECS before. The incoming panel for the 1980 survey becomes the longitudinal panel for the 1982 survey and the incoming panel for the 1982 survey becomes the longitudinal panel for the 1984 survey.

However, as with most longitudinal surveys, the composition of the panels changes over time. The housing units in the incoming panel of the 1980 survey and the longitudinal panel of the 1982 survey are not exactly the same. The same applies to the incoming panel for the 1982 survey and the longitudinal

Appendix A

panel for the 1984 survey. Some of the reasons for the differences are changes in the target sample size, nonresponse to either survey, procedural error, interviewer error, demolition, new construction, out-of-scope units changing to residential units and residential units changing to out-of-scope units. The longitudinal panel for the 1982 survey contains a total of 2,337 housing units. Of these units, there were 1,983 housing units that appeared in the 1980 incoming panel. Of these 1,983 common housing units, 1,616 were occupied by the same family in both surveys and 367 were occupied by different families.

Similarly, the longitudinal panel for the 1984 survey contains a total of 2,724 housing units, of which 1,780 housing units appeared in the incoming panel for the 1982 survey. Of these 1,780 common housing units, 1,358 were occupied by the same family in both surveys and 422 were occupied by different families. The presence of the same housing units, especially the same households, would have the effect of reducing the sampling error for comparisons (between 1980 and 1982 and between 1982 and 1984) that are based on statistics covering categories that contain a large proportion of these longitudinal housing units. This effect will be discussed in more detail later in this appendix.

Data Collection

Personal interviews were conducted with adult residents of about 85 percent of the eligible units in each survey, with a further 5 percent responding to a mailed questionnaire containing a shorter version of the personal-interview questionnaire (Table A2). The drop in the mail questionnaire response rate for the 1984 survey was probably because of the discontinuation of the $2 incentive for filling out the mail questionnaire.

Table A2. Response Rates for Residential Energy Consumption Surveys (Percent)

Survey Year	Personal Interview Response Rate	Mail Questionnaire Response Rate	Additional* Respondents Added by Mail Questionnaire	Total Response Rate
1978	85.2	35.9	5.3	90.5
1979	85.5	41.2	5.1	90.6
1980	87.5	38.1	3.7	91.2
1981	86.8	44.0	4.8	91.6
1982	84.9	35.4	4.7	89.6
1984	81.1	19.5	3.0	84.2

* The mail questionnaire was not sent to all nonrespondents to the personal interview.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, The Residential Energy Consumption Surveys, 1978, 1979, 1980, 1982, and 1984.

Upon receiving written permission from the household, the household's fuel suppliers were asked to supply billing records for fuel purchases. For the 1980 survey, usable records were received for 83 percent of households using

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electricity, 75 percent of those using natural gas, 55 percent of those using fuel oil or kerosene, and 66 percent of those using LPG. These figures have not changed substantially throughout the surveys, except with respect to fuel oil and kerosene.

For the 1984 survey, the consumption of kerosene was not combined with the consumption of fuel oil as it was in all previous surveys. This change was made because of the increased use of portable kerosene heaters. Kerosene for these heaters was typically bought on a cash-and-carry basis. As a result, there was very little supplier data. The percentage of usable records for both fuel oil and kerosene decreased in 1984 from previous surveys. For the 1984 survey, data on kerosene consumption was based on supplier data for 10 percent of the households using kerosene, on household estimates for 50 percent, and was imputed for 40 percent. For the 1984 survey, data on fuel oil consumption was based on supplier data for 43 percent of the households using fuel oil, on household estimates for 1 percent, and was imputed for 56 percent. There was a decrease in the percentage of usable energy supplier data for other fuels as well, but the decrease was not as large.

Records are not available for households whose fuel costs are included in the rent, and some records cannot be used because they represent an unknown portion of a year. These problems are particularly acute for fuel oil/kerosene data. The fuel oil/kerosene data (especially for apartments) are, therefore, of lower quality than data for the other fuels throughout the six surveys.

For all six surveys, the household interviews were conducted in the fall of the year. November has been taken as the midpoint of the survey period. The data on consumption and expenditures generally cover the period from the April before the autumn interview through March of the following year. The monthly billing records were adjusted to a full year, and regression procedures were used to impute data for households with few or no billing records. The regression equations were different for each survey. Questions were added to the survey when their need became apparent. In many cases, responses to these additional questions were used in the regression equations to improve the ability of the equations to predict energy consumption. In addition, the experience gained in estimating regression equations in the early surveys helped to improve these equations for later surveys.

Nonhousehold Use of Energy. To avoid double counting of energy used in nonsample households or for nonhousehold purposes (such as for a welding business or grain drying), adjustments were made to the household's fuel bills. The adjustment was based on the respondents' description of the nonhousehold use and estimate of the proportion of energy used for the nonhousehold purposes. These adjustments were made to few households. In 1982, the adjustments were made to sample households representing the following estimated totals.

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Energy Source	Millions Households
Electricity	2.0
Natural Gas	0.6
Fuel Oil/Kerosene	0.2
LPG	0.2

The adjustments were always in the direction of reducing consumption of and expenditures for the households affected.

The effect of the reduction of electricity consumption for the 1982 survey, when spread over all 83.7 million users of electricity, was a decrease of 0.4 million Btu of electricity per household. This represents a decrease of 1.3 percent from 29.3 million Btu to 28.9 million Btu.

The decrease in natural gas consumption when spread over all 54.2 million users of natural gas was 0.6 million Btu per household. This represents a decrease of 0.7 percent from 88.7 million Btu per household to 88.1 million Btu.

The reduction of LPG was 2.1 million Btu per household averaged over the 7.3 million households using LPG. This reduction represented a 5.0 percent decrease from 41.5 million Btu per household to 39.4 million Btu.

The reduction of fuel oil/kerosene was 0.5 million Btu per household averaged over the 15.5 million households using fuel oil/kerosene. This reduction represented a 0.6 percent decrease from 73.9 million Btu per household to 73.4 million Btu.

Subtraction of nonhousehold energy use from the household's billing records was carried out for the 1980, 1981, and 1984 surveys, similar to what has been described for the 1982 survey. No adjustment was made for the 1979 survey because data on this topic was not collected in that survey. In 1978, households with nonhousehold use of fuels had their consumption imputed via a regression equation regardless of the availability of billing records from the utility company.

Master-Meter Apartments. Some apartments are master-metered, with one meter recording the energy used by a group of apartments. Under these conditions, billing data are not available from the utility company for individual apartments and the annual consumption for these apartments in the RECS sample must be imputed. The imputation procedure assumes that the regression equations developed from data for households with actual billing records can be used to predict the energy consumption for master-metered apartments. If this assumption is not valid, then the estimates of annual consumption and end-use consumption estimates will be biased.

For the 1981 and 1982 surveys, adjustments were made in the regression equations used in the imputation procedures for consumption of electricity and natural gas. These adjustments take into account some differences between patterns of energy consumption for households living in master-metered buildings and those

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living in buildings with individual meters. The effect of these adjustments was to increase the imputed values of electricity for apartments where electricity was used for air conditioning and of natural gas for apartments where natural gas was used, but not used as the main space heating fuel. The regression equation used for imputations for the 1984 survey were designed to better handle differences caused by housing type and household behavior. As a result, the adjustments were not used for the 1984 survey.

To assess the effect of these adjustments on consumption trends, a special effort was undertaken to study the adjustments made to the consumption data for the 1982 survey. In that year, the adjustment to the regression equation for electricity added 0.077 quadrillion Btu to the consumption of 4.4 million apartments (the adjustment was to multiply the imputed electricity consumption by 1.84 for sampled apartments where electricity was used for air conditioning and where the electricity consumption was imputed). The adjustment for natural gas (consumption times 2.04) added 0.051 quadrillion Btu of natural gas to the consumption of 2.5 million apartments that used natural gas, but not as the main space heating fuel and where the natural gas consumption was imputed. (The adjustment factors were determined by a comparison of the regression estimates with a disaggregation of the specially collected billing records for buildings containing sample units. The disaggregation provided an estimate for individual apartments by dividing the buildings consumption by the number of apartments in the building.)

The effect of these adjustments for electricity and natural gas was to increase the average electricity consumption over all apartments by 20.0 percent (from 17.1 million Btu per household to 20.6) and the average natural gas consumption over all apartments by 5.0 percent (from 60.2 million Btu per household to 63.2). Because of these uneven adjustments, which affect the year-to-year comparisons for apartments, data are not reported separately for apartments in this report.

Single-Person Household. The 1982 and 1984 surveys used an intermediate ratio adjustment to bring the RECS estimates of single-person households more in line with the Current Population Survey. The proportion of single-person households was 23.0 percent in the 1982 RECS, 19.3 percent in 1980, and averaged 19.1 percent in the first four surveys.

The effect of this adjustment for the 1982 survey was to reduce the average consumption per household by about 1 percent (from 104.2 to 102.9 million Btu per household), since single-person households use less energy per unit than multi-person households.

The estimate of the consumption without the adjustment was calculated by summing the cross products (0.190 x 80.2, 0.674 x 105.8, and 0.136 x 130.0). The first number in the cross product is the proportion of households with single-persons, 2 to 4 people, and 5 or more people averaged over the 1978 and 1980 surveys (Table 17, Chapter 5). The second number is the consumption of all fuels for 1982 for households with 1, 2 to 4, and 5 or more persons (Table 15, Chapter 5).

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Data Editing. Changes in data-editing procedures that have occurred since the first RECS, have a small effect on the average consumption and expenditures statistics. In particular, some household records contain a zero value for consumption or expenditures for a fuel that conflicts with other information on the record that indicates that the fuel is used. The 1978 RECS contained 0.221 million households that have zero consumption of and expenditures for natural gas, but the record indicated they used natural gas as their main heating fuel. The 1979 survey contained 0.017 million households in this category. No such records exist in the 1980-1984 surveys for natural gas or for electricity for any year. Such records exist in each survey for fuel oil/kerosene and LPG (except 1979 for LPG), but these records may not indicate a data error because it is possible for a household to use a portion of its fuel supply during the course of a year without needing to have the fuel tank resupplied.

It is impossible to tell what effect the inclusion of the zero-value records for natural gas would have on consumption and expenditures statistics, because it is not clear how the conflicting cases would be resolved. In any case, the effect is likely to be very small, because so few cases were involved.

Tertiary Space Heating. The 1982 and 1984 RECS collected data on tertiary equipment used for space heating. None of the earlier surveys had done this, so some increase in the use of auxilary heating equipment in 1982 would result from the expanded data collection. About 5 percent of households use three or more types of heating equipment and, as such, may increase the proportion of households that used a particular equipment type for auxilary heating. Electricity space heaters, portable kerosene heaters, and wood burning equipment are the equipment types most affected.

All six surveys collected data on any auxiliary use (secondary or tertiary) of natural gas, LPG, fuel oil, kerosene, and electricity for space heating. The 1982 and 1984 surveys also collected data on any auxiliary (secondary or tertiary) use of wood, coal, and solar for space heating. The four earlier surveys only collected data on the use of wood, coal, and solar as the primary or secondary source of space heating, but not as a tertiary source. Hence, any increase in the use of wood for auxiliary heating may be affected by this change.

Summary. The cumulative effect of all these differences (with one exception) is not thought to affect the general pattern of trends in consumption and expenditures significantly. The one exception is the shift of households into warmer climate zones in the West that occurred with the 1980 survey.

Geographic Shift. The revised sample design first used for the 1980 survey has some changes in the distribution of population characteristics. Some of these changes can probably be attributed to the revised stratification scheme. Incorporating information on main heating fuel to the stratification appears to be related to the 1980 drop in consumption in the North Central region, where a higher proportion of homes were heated by electricity or wood and a lower proportion were heated by natural gas in 1980 than 1978. Part of this shift in the distribution of households by main heating fuel may have been caused by the improved stratification.

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The stratification by weather conditions appears to have led to some shifts in the population distribution by weather zone. The reason for this is that in most cases, the households in a Primary Sampling Unit (first-level sampling among groups of counties) are located in the same weather zone, so when a Primary Sampling Unit is selected it adds a large increment to the weather zone it is located in. This effect is most pronounced in the West, the region with the widest range of climate conditions among the four Census regions. The 1980 survey and subsequent surveys have a higher proportion of households in the West residing in warmer climate zones than the 1978 and 1979 surveys did. This shift may have been large enough to have noticeably affected the results presented in this report.

The possible effect of this shift was analyzed by first determining the relative proportion of the weighted observations that fall in each American Institute of Architects (AIA) weather zone by Census region for the 1978 and 1980 surveys. The proportion for the 1980 survey was determined after Alaska and Hawaii were dropped. (The effect of adding Alaska and Hawaii to the survey in 1980 is discussed below.) This verified the fact that the 1978 survey did have a higher proportion of households in colder areas in the West Census Region than the 1980 survey. The shift in the other regions was a slight shift in the opposite direction. The weights for the 1978 survey were then ratio adjusted so that the proportions matched those for the 1980 survey. The average energy consumption for 1978 was then reestimated using these weights and compared with the original estimates. The results showed that reweighting lowered the estimated average natural gas consumption in the West Census region by 25 percent, but the estimated average electricity consumption increased by 5 percent. The consumption changes estimated for the national averages were a 0.7 percent increase for electricity, a 2 percent decrease for natural gas, a 12 percent increase for LPG, and a 6 percent increase for fuel oil/kerosene.

The only comparison that seems to be adversely effected by this shift is the comparison between the average natural gas consumption in the West Census region between the 1978 survey and the results for the 1980 survey and later surveys. About one-half of the drop in natural gas consumption in the West Census region from the 1978 survey to the 1980 survey can possibly be attributed to the shifts in the distribution of households by weather zone.

Part of the reason for the change in the West was the addition of Alaska and Hawaii to the sample in 1980. Including Alaska added 0.1 million households to the coldest weather region in the West, and including Hawaii added 0.3 million households in the warmest weather zone in the West. However, when the 1980 sample for the West is compared to the 1979 sample, the change in population distribution by weather zone is far greater than could be explained by the addition of these two States to the West region.

The effect of not covering Alaska and Hawaii in the 1978 survey was examined by analyzing the results for the 1980, 1981, 1982, and 1984 surveys. The estimated average electricity consumption in the West Census region increased for all four surveys when Alaska and Hawaii were dropped. The increase ranged from 0.4 percent to 0.5 percent. The change in the estimated average natural gas consumption ranged from a 1.2 percent decrease to a 0.7 percent decrease. The

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change in the estimated average LPG consumption ranged from a 5.5 percent increase to a 15 percent increase. The change in the estimated average fuel oil/kerosene consumption ranged from a 3 percent decrease to a 3 percent increase.

The effects of dropping Alaska and Hawaii on the national averages were similar in direction to the West Census region changes but were smaller. For all four surveys analyzed and all four fuels, the changes were less than 1.0 percent. In particular, the increase in the estimated average electricity consumption ranged from a 0.07 percent increase to a 0.15 percent increase. The decrease in the estimated average natural gas consumption ranged from a 0.1 percent decrease to a 0.2 percent decrease.

Sampling Errors

One component of total survey error that can be estimated is sampling error. Sampling error occurs because the different samples that could be drawn would each produce different values for the survey statistics. The magnitude of the sampling error is measured by the variance, which is the expected squared difference between (1) the estimate based on the sample and (2) the true value in the target population.

For some types of surveys, a convenient algebraic formula for computing variances can be obtained. However, each RECS used a multistage area sample design of such complexity that it is virtually impossible to construct an exact algebraic expression for estimating variances. Instead, the method used to estimate sampling variances for these surveys was balanced half-sample replication (National Center for Health Statistics 1966, 1969). This numerical method involves pairing primary sampling units (PSU's) in strata so that differences between the members of each pair can be used to build an estimate of sampling variance.

Half-sample replication involves repeatedly drawing pair members from each strata. Each replication is called a "half-sample" because only one member of the pair within each of the strata is selected. The sampling weights of housing units in any selected member are adjusted upward so that they represent not only themselves but all housing units in the stratum. In this way, each half-sample can produce unbiased survey statistics based on roughly one-half of the data.

For each survey, using different combinations of members from the pairs, it is possible to produce a total of over 1 billion unique half-samples. Although desirable for good variance estimation, a 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 strata) to produce estimates of variance that are identical to estimates based on all possible unique half-samples for linear survey statistics. With this balancing method, each half-sample is constructed by using an orthogonal matrix adapted from Plackett and Burman (1946) to control the selection of pair members from strata. The 1978 and 1979 surveys used 72 half-samples, the 1980, 1981, and 1982 surveys used 32 half-samples, and the 1984 survey used 128 half-samples.

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The variances are estimated from the half-sample statistic in the following way. Let X' be a survey estimate of characteristic X for a certain category of buildings (for example, total consumption of natural gas in the West Census region). Then, the estimated variance of X' is given by:

$$S^2_{X'} = (1 / NH) \sum_{i=1}^{NH} (X'_i - X')^2 ,$$

where X'_i is the i-th half-sample estimate of X and NH is the number of half-samples. The standard error of X' is given by:

$$S_{X'} = \sqrt{S^2_{X'}} .$$

The relative standard error (percent) of X' is given by:

$$RSE(X') = (S_{X'} / X') \times 100.$$

Generalized Variances

For every estimate in this report, a relative standard error (RSE) was computed by the methods described above. 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 tables in Chapter 5. For an estimate in the i-th row and j-th column of a particular table, the approximation RSEA(i,j) for the original half-sample estimate of RSE(i,j) is given by the simple formula:

$$RSEA(i,j) = R(i)\ C(j),$$

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.

The use of the row and column RSE factors is illustrated in Figure A1, from a portion of the first page of Table 17. Using the row of the table, labeled "Main Space Heating Fuel: Natural Gas," and the column, labeled "Percent of Households: 1980," gives an estimate of 54.6 for the percentage. The RSE row factor is R(11) = 3.42 . The RSE column factor is C(6) = 0.87. The approximate RSE for the estimate is, therefore:

$$RSEA(11,6) = (3.42)(.87) = 2.98 \text{ percent.}$$

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Figure A1. Use of RSE Row and Column Factors

United States

Household Characteristics	Millions of Households				Percent of Households				RSE Row Factor
	1978	1980	1982	1984	1978	1980	1982	1984	
RSE Column Factor:	1.33	0.87	0.98	0.89	1.33	0.87	0.98	0.89	
All Households	76.6	81.6	83.8	86.3	100.0%	100.0%	100.0%	100.0%	0.00
Weather Zone									
Fewer than 2,000 CDD and--									
More than 7,000 HDD	6.3	8.5	8.5	9.0	8.2	10.4	10.2	10.4	19.98
5,500 to 7,000 HDD	21.6	20.9	21.0	21.5	28.2	25.7	25.1	24.9	7.72
4,000 to 5,499 HDD	20.3	21.1	22.1	22.5	26.5	25.9	26.4	26.1	9.24
Fewer than 4,000 HDD	16.8	19.0	19.6	20.0	21.9	23.3	23.3	23.1	8.47
More than 2,000 CDD and Fewer than 4,000 HDD	11.6	12.1	12.6	13.3	15.1	14.8	15.0	15.4	8.22
Year of Construction									
Before 1950	32.7	30.8	30.6	32.2	42.7	37.7	36.6	37.3	3.44
1950 to 1974	38.7	39.5	40.2	39.0	50.5	48.4	48.0	45.2	3.10
After 1974	5.2	11.3	12.9	15.2	6.8	13.9	15.4	17.6	D
Main Space Heating Fuel									
Electricity	12.1	14.3	13.4	14.5	15.8	17.5	16.0	16.8	7.73
Natural Gas	41.8	44.6	47.5	47.8	54.6	54.6	56.7	55.4	3.42
Fuel Oil/Kerosene	16.9	13.4	12.0	12.2	22.1	16.4	14.4	14.1	5.69
LPG	3.1	3.7	3.8	3.9	4.1	4.5	4.5	4.5	11.97
Wood	1.9	4.7	5.6	6.5	2.5	5.8	6.7	7.5	13.14
Other or None	.8	1.0	1.5	1.4	1.0	1.2	1.7	1.6	24.93

$$\text{RSE}\left\{\begin{array}{l}\text{Percent of Households Using}\\ \text{Natural Gas as the Main}\\ \text{Space Heating Fuel}\end{array}\right\} = (3.42)(0.87)$$

$$= 2.98$$

$$\text{Standard Error}\left\{\begin{array}{l}\text{Percent of Households Using}\\ \text{Natural Gas as the Main}\\ \text{Space Heating Fuel}\end{array}\right\} = (2.98)(54.6)/100$$

$$= 1.63$$

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

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This value for the RSE can be used to construct confidence intervals and to perform hypothesis tests. However, because the generalized variance procedure gives only approximate RSE's, such confidence intervals and statistical tests must also be regarded as only approximate.

The RSE is the ratio (standard error of the statistic divided by the value of the statistic) multiplied by 100:

$$RSE(X) = 100 * (SE(X)/X).$$

For the example above, the estimated percent of households using natural gas as their main space heating fuel is 54.6. Since the estimated RSE is 2.98 percent, the estimate for the standard error is:

$$SE(X) = (RSE(X) * X)/100 = (2.98)*(54.6)/(100) = 1.63$$

The 95-percent confidence interval is constructed by adding and subtracting the product 1.96*SE from the estimated value. For this example, the estimate for the 95-percent confidence interval for the percent of households using natural gas as their main heating fuel is the interval from 51.4 to 57.8.

Notice that the column factors can be used to relate the efficiency of each survey. In particular, the column factors tend to follow the reverse order as the sample size. Major exceptions to this are Tables 24, 25, and 26, which deal with fuel oil/kerosene consumption. The percent of households that are using fuel oil has declined, but the percentage of households using kerosene has increased. The households that have started to use kerosene tend to use it for portable space heaters. The kerosene consumption for these households tends to be considerably less than the fuel oil consumption of the households that use fuel oil. This may explain why the pattern for the column factors for these tables does not follow the pattern that they do for the other tables.

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:

$$\log RSEA(i,j) = m + a(i) + b(j).$$

The least-squares estimates for this model are given (Cochran and Cox, 1957) by:

$$m = \overline{(\log RSE)}$$

$$a(i) = \overline{(\log RSE)}_{i.} - \overline{(\log RSE)}$$

$$b(j) = \overline{(\log RSE)}_{.j} - \overline{(\log RSE)},$$

where

$\overline{(\log RSE)}$ = mean of log RSE(i,j) over all rows and columns,

$\overline{(\log RSE)}_{i.}$ = mean over all columns for a particular row i,

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and

$$\overline{(\log RSE)}_{.j} = \text{mean over all rows for a particular column } j.$$

The row and column RSE factors are then computed as:

$$R(i) = \text{antilog } (m + a(i)) = \text{antilog } \overline{(\log RSE)}_{i.}$$

$$C(j) = \text{antilog } b(j) = \text{antilog } \left(\overline{(\log RSE)}_{.j} - \overline{(\log RSE)} \right).$$

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), is an adjustment factor with geometric mean equal to 1.0.

For a few table cells, there was no basis for computing an RSE because the RSE could not be calculated because of a very small sample size or were missing data on the 1978 survey. For example, the 1978 survey did not list the Census division that the housing unit was located (only the Census region). Additionally, during the 1978 survey the square footage was not measured (a respondent estimate was obtained). Consequently, there are no statistics for the 1978 survey based on Census division data or square footage data. Thus, some of the tables had a few missing values for the RSE's. 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 procedure used to compute these estimates is described in Cochran and Cox (1957, p. 110).

There is no listed row factor for any of the tables where the row is restricted to statistics concerning households built after 1974. For this row, the addition of new housing to the universe results in a much larger number of sample observations in this category for the later RECS than for the earlier RECS. This makes the assumptions behind the calculation of the row and column factors untenable. Hence, these rows were excluded from the calculation of the row and column factor. The tables below list the RSE's for these rows.

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Table A3. Relative Standard Errors for Table 15 — Row for Year of Construction: After 1974 (Percent)

Region	Btu Per Household				Adj Btu Per Household			
	1978	1980	1982	1984	1978	1980	1982	1984
United States:	8.8	3.8	3.6	3.1	6.5	2.7	3.1	3.0
Northeast:	35.8	14.4	17.6	11.3	22.3	5.6	11.3	9.0
North Central:	8.5	8.8	7.4	5.3	8.2	5.6	7.6	7.0
South:	8.6	7.2	7.1	6.4	4.7	4.6	5.6	5.5
West:	19.8	5.9	7.1	6.1	11.0	4.0	4.2	4.3

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, The Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

Table A4. Relative Standard Errors for Table 16 — Row for Year of Construction: After 1974 (Percent)

Region	Dollars per household			
	1978	1980	1982	1984
United States:	6.2	3.6	3.3	2.9
Northeast:	18.6	9.3	13.2	9.8
North Central:	9.1	6.0	6.6	6.0
South:	4.7	5.8	5.5	5.5
West:	17.1	4.5	4.5	4.5

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, The Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

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Table A5. Relative Standard Errors for Tables 17, 20, 23, 26, and 29 — Row for Year of Construction: After 1974 (Percent)

Table and Region	Millions of Households				Percent of Households			
	1978	1980	1982	1984	1978	1980	1982	1984
TABLE 17:								
United States:	17.9	7.5	7.4	5.9	17.9	7.5	7.4	5.9
Northeast:	68.9	20.1	13.5	14.3	68.9	20.1	13.5	14.3
North Central:	27.0	15.9	19.6	13.5	27.0	15.9	19.6	13.5
South:	13.0	9.3	11.1	10.4	13.0	9.3	11.1	10.4
West:	36.0	11.4	9.6	7.4	36.0	11.4	9.6	7.4
TABLE 20:								
United States:	17.9	7.5	7.4	5.9	17.9	7.5	7.4	5.9
Northeast:	68.9	20.1	13.5	14.3	68.9	20.1	13.5	14.3
North Central:	27.0	15.9	19.6	13.5	27.0	15.9	19.6	13.5
South:	13.0	9.3	11.1	10.4	13.0	9.3	11.1	10.4
West:	36.0	11.4	9.6	7.4	36.0	11.4	9.6	7.4
TABLE 23:								
United States:	21.1	11.8	11.9	8.8	21.7	12.4	11.5	8.2
Northeast:	54.7	36.1	36.2	35.3	58.4	31.8	34.2	32.8
North Central:	31.8	23.7	25.1	15.7	32.3	23.6	24.3	15.4
South:	37.7	17.8	18.6	20.0	37.8	17.0	17.5	18.2
West:	61.4	18.9	17.8	11.1	62.3	18.4	16.6	10.1
TABLE 26:								
United States:	40.0	20.6	18.0	12.2	43.1	18.4	18.3	12.2
Northeast:	59.0	20.5	28.3	20.0	64.7	21.4	29.5	20.0
North Central:	74.7	41.2	42.9	22.6	80.4	34.1	42.9	19.9
South:	48.9	34.1	32.4	23.1	46.9	29.1	30.6	23.4
West:	NSC	NSC	31.0	61.5	NSC	NSC	37.3	65.0
TABLE 29:								
United States:	31.6	19.5	21.0	21.2	29.2	15.0	20.9	19.0
Northeast:	98.2	37.7	58.4	53.2	96.3	38.3	87.6	44.8
North Central:	70.3	28.1	31.0	26.7	86.6	21.0	25.8	27.5
South:	48.8	31.8	37.4	34.0	44.0	24.2	41.4	27.8
West:	50.4	30.7	29.0	40.1	27.9	23.7	28.5	38.1

NSC = No Sample Cases

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, The Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

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Table A6. Relative Standard Errors for Tables 18, 21, 24, and 27 — Row for Year of Construction: After 1974 (Percent)

Table and Region	Million Btu per Household 1978	1980	1982	1984
TABLE 18:				
United States:	10.0	3.7	4.7	4.2
Northeast:	25.6	10.1	8.7	11.8
North Central:	20.8	11.2	14.8	13.9
South:	7.2	4.8	5.9	6.1
West:	29.4	5.3	6.2	5.8
TABLE 21:				
United States:	10.1	5.3	5.3	3.5
Northeast:	38.6	11.3	33.6	14.8
North Central:	10.2	11.2	11.9	6.6
South:	17.8	12.0	12.9	6.4
West:	26.0	6.6	6.0	6.3
TABLE 24:				
United States:	15.6	11.8	12.1	14.4
Northeast:	NC	13.5	8.3	10.4
North Central:	22.7	28.8	39.7	34.8
South:	26.0	31.8	43.7	29.5
West:	NSC	NSC	74.7	58.2
TABLE 27:				
United States:	45.0	12.6	12.6	17.4
Northeast:	NC	37.3	54.0	54.5
North Central:	NC	13.2	18.6	16.4
South:	NC	35.3	25.0	30.4
West:	NC	15.2	29.0	12.3

NC = Not Calculated
NSC = No Sample Cases
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, The Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

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Table A7. Relative Standard Errors for Tables 19, 22, 25, and 28 — Row for Year of Construction: After 1974 (Percent)

Table and Region	(Fuel Price) Dollars per Million Btu 1978	1980	1982	1984	(Expenditures) Dollars per household 1978	1980	1982	1984
TABLE 19:								
United States:	7.7	2.9	2.6	2.1	7.6	3.5	3.9	3.8
Northeast:	12.2	5.3	6.3	3.7	19.8	8.8	8.9	13.6
North Central:	6.7	6.8	9.5	6.6	18.2	7.9	9.6	9.1
South:	1.9	4.6	2.6	2.5	6.9	5.5	5.7	6.1
West:	43.9	5.5	3.8	4.1	11.1	4.4	6.2	6.0
TABLE 22:								
United States:	4.9	2.5	4.8	1.7	8.4	4.7	8.3	3.1
Northeast:	16.5	15.2	6.4	7.3	27.2	18.8	34.8	14.8
North Central:	2.3	4.2	4.0	2.0	9.7	9.8	10.6	6.5
South:	7.2	6.2	9.8	4.0	18.8	12.6	11.5	6.8
West:	41.4	2.3	3.8	3.2	27.7	5.2	5.3	5.5
TABLE 25:								
United States:	0.5	0.5	0.5	2.9	15.6	11.7	12.0	14.6
Northeast:	NC	0.6	0.8	1.0	NC	13.2	8.4	10.6
North Central:	NC	1.9	2.0	10.0	NC	29.0	39.3	38.6
South:	1.9	0.8	2.6	5.8	26.2	31.6	42.9	25.8
West:	NSC	NC	1.8	NC	NSC	NC	74.6	NC
TABLE 28:								
United States:	11.5	1.7	3.6	4.7	36.9	11.3	10.6	13.6
Northeast:	NC	9.5	NC	15.0	NC	28.6	47.5	44.7
North Central:	NC	1.6	2.5	3.5	NC	11.7	16.8	14.5
South:	NC	8.1	6.1	10.0	NC	32.4	21.5	23.0
West:	NC	2.2	15.4	3.6	NC	15.0	22.6	10.0

NC = Not Calculated
NSC = No Sample Cases
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, The Residential Energy Consumption Surveys, 1978, 1980, 1982, and 1984.

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Additionally, the rows giving the total number of households for each survey were not used in the row column calculations (for example, row 1 of Table 17). For each survey, the total number of households was a fixed number based on Census Bureau's CPS results. Any error in this number can be considered a bias and not a sampling error.

Simultaneous Inference

In Chapter 1, confidence intervals were introduced as a method of displaying the uncertainty in statistical estimates. In most parts of the text, 95-percent confidence intervals were used. The 95-percent confidence interval has the following interpretation: if the survey were repeated with every possible sample, the true mean value of the statistic in question should fall within this confidence interval, calculated for each survey, for 95 percent of the surveys. The relation between confidence intervals and statistical significance was utilized in the text. In particular, a difference will be considered statistically significant from 0 if the 95-percent confidence interval for the difference does not overlap 0.

In Chapters 2 and 3 the regions with the largest and smallest consumption amounts were discussed. In Chapter 4 the relative rank of the four fuels was discussed. Confidence intervals were used to determine if one of the four regions had the largest (smallest) value or if one of the four fuels contributed the most (least) energy in a certain region.

To maintain an overall confidence level of 95 percent, simultaneous inference techniques need to be used. For example, to say that the North Central Census region has the highest energy consumption, three confidence intervals need to be examined. The probability that an individual 95-percent confidence interval will cover the true difference is 0.95. But the joint probability that all three 95-percent confidence intervals will simultaneously cover the true differences is less than 0.95. In order for the joint probability to be at least 0.95, the size of the confidence intervals will have to be increased.

Since we also frequently identify which region that has the smallest value and which region that has the largest value, we decided to always use 6 (number of ways of comparing the four regions two at a time) as the number of simultaneous comparisons that were made. The Bonferroni Inequality (Miller, 1966) then implies that if we use $1 - 0.05/6 = 0.99167$ as the level for each individual confidence interval, then the overall level of the 6 confidence intervals will be at least 0.95. A 0.99167-level confidence interval can be constructed by adding and subtracting 2.64 times the standard error for the statistic to the estimated value of the statistic.

Standard Error Using Common Sample Design

The row column factors were based on RSE's calculated for the individual surveys. The 1978 and 1979 surveys used 72 half-samples; the 1980, 1981, and 1982 surveys used 32 half-samples; and the 1984 survey used 128 half-samples. These RSE's are designed to give the RSE's for individual statistics. When comparing statistics across surveys, these RSE's will, in many cases, overestimate the appropriate RSE.

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This is because the results of one survey may not be independent of the results for another survey. This happens because some of the surveys have Primary Sampling Units (PSU's) and Secondary Sampling Units (SSU's) in common. For all surveys, the PSU's are composed of individual or groups of counties and cities and the SSU's are composed of minor civil divisions. Within a sampled SSU, a Census enumeration district (ED) is selected and within the sampled ED's a cluster of housing units is selected. The housing units selected for the surveys are selected from the cluster. The fact that housing units within the same PSU and SSU are similar in many ways that affect energy consumption is one cause of the dependencies between results of some of the surveys.

In addition, the presence of longitudinal households adds additional dependencies between results of the 1980 and 1982 surveys and the 1982 and 1984 surveys. If two surveys use the same PSU's and SSU's and/or have longitudinal housing units in common, then a better estimate of the RSE of a change can be obtained by using a common half-sample design for the two surveys and calculating the difference for each half-sample.

Let $DX = X_1 - X_2$ where X_1 was a statistic obtained for one survey and X_2 was the corresponding statistic obtained from another survey. If the results of the two surveys are independent, then the variance of DX equals the sum of the variances of X_1 and X_2. From the variance, the standard error and the RSE can be calculated using the usual relations. These are denoted as the "Independent Samples" variance, standard error, and RSE. If the two surveys are not independent (such as the 1980 survey and any of the 1981, 1982, and 1984 surveys), then the RSE may be substantially less than the Independent Samples RSE. One way to calculate a better estimate of the RSE is to use a common half-sample design for the two surveys and calculate the difference for each half-sample and use the half-sample variance estimation technique on the differences. These estimate are denoted as the "Dependent Samples" variance, standard error, and RSE.

The PSU's and SSU's for the 1978 and 1979 survey were the same. Also the half-sample matrix used for the RSE estimation was the same, hence, this common half-sample matrix can be used to calculate the "Dependent Samples" estimate for the RSE of statistics giving the change between the results of the 1978 and 1979 surveys. Similarly the PSU's and SSU's for the 1980, 1981, and 1982 survey were the same. There were a few changes in the PSU's and SSU's for the 1984 survey, but a large majority of them were the same. The 128 half-sample matrix that was created to estimate the RSE for the 1984 survey can be used to estimate the RSE for any of the last four of the surveys (1980, 1981, 1982, and 1984). Using this 128 half-sample design, it is also possible to estimate the "Dependent Samples" RSE of statistics giving the changes between any of the last four surveys. When examining differences between one of the first two surveys and one of the last four surveys, it is necessary to assume that the surveys were independent. Tables A8 and A9 give the estimated RSE assuming two independent surveys, the RSE using the dependencies between the surveys, and the percent drop in the RSE for a few statistics.

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Table A8. Dependent and Independent Sample Estimates of Standard Errors for Changes in Percent of Households in American Institute of Architects Weather Zone 2

	Survey Year					
	1978	1979	1980	1981	1982	1984
Percent of Households in American Institute of Architects Weather Zone 2	28.2	27.4	25.6	25.2	25.1	24.9
Standard Error of Percent	2.9	2.6	1.7	1.8	1.8	1.5
Change from 1978 to Survey Year	0.0	-.8	-2.5	-3.0	-3.1	-3.3
Independent Sample Standard Error	NA	3.9	3.4	3.4	3.4	3.3
Dependent Sample Standard Error	NA	1.4	NA	NA	NA	NA
Drop in Standard Error (percent)	NA	64.5	NA	NA	NA	NA
Change from 1980 to Survey Year	2.5	1.7	0.0	-.4	-.6	-.7
Independent Sample Standard Error	3.4	3.1	NA	2.5	2.4	2.3
Dependent Sample Standard Error	NA	NA	NA	.4	.3	.8
Drop in Standard Error (percent)	NA	NA	NA	82.6	86.2	64.0

NA = Not Applicable

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, The Residential Energy Consumption Surveys, 1978, 1979, 1980, 1981, 1982, and 1984.

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Table A9. Dependent and Independent Sample Estimates of Standard Errors for Changes in Percent of Households that Use Natural Gas as their Main Space Heating Fuel

	Survey Year					
	1978	1979	1980	1981	1982	1984
Percent of Households Using Natural Gas as Their Main Space Heating Fuel	54.6	54.7	54.6	55.6	56.7	55.4
Standard Error of Percent	2.5	2.4	2.1	1.7	1.9	1.5
Change from 1978 to Survey Year	0.0	0.1	0.0	1.0	2.1	0.8
Independent Sample Standard Error	NA	3.5	3.3	3.0	3.2	3.0
Dependent Sample Standard Error	NA	.9	NA	NA	NA	NA
Drop in Standard Error (percent)	NA	74.3	NA	NA	NA	NA
Change from 1980 to Survey Year	0.0	0.1	0.0	1.0	2.1	0.8
Independent Sample Standard Error	3.3	3.2	NA	2.7	2.9	2.6
Dependent Sample Standard Error	NA	NA	NA	1.2	0.9	1.4
Drop in Standard Error (percent)	NA	NA	NA	54.7	68.5	49.0

NA = Not Applicable

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, The Residential Energy Consumption Surveys, 1978, 1979, 1980, 1981, 1982, and 1984.

Notice that the percentages for Weather Zone 2 are close to each other for the Group 1 survey. Similarly, they are close for the Group 2 surveys. But there appears to be a change from the Group 1 results to the Group 2 results. This change is not statistically significant. The reason why the results for the surveys in the same group are so similar is that the same design was used. Note that the dependent sample standard error for the weather zone case is much smaller than the independent sample standard deviation.

Additional precision on the changes may sometimes be obtained by comparing the incoming panel of the 1980 survey with the longitudinal panel for the 1982 survey or the incoming panel of the 1982 survey with with the longitudinal panel for the 1984 survey. In these two cases, the overlap in the households is maximized. The table below lists the results for changes in the percentage of households using natural gas as the main heating fuel. Note that the estimate using a single panel is not necessarily the same as the estimate using an entire sample.

There is no significant difference between the standard error from the full sample comparison of the 1980 and 1982 surveys and the longitudinal panel comparison with respect to the percentage of households that use natural gas as the main heating fuel. Even though the longitudinal panel for 1982 contains a majority of housing units that were also in the 1980 incoming panel, the drop in the sample size from the full sample to a panel (drop equals approximately one-half) counteracts any

gain in precision for this statistic. For other statistics, the full sample standard error may be smaller or larger than the longitudinal panel standard error. The gain in using a longitudinal panel can be seen in that the percentage drop from the "Independent Samples" to the "Dependent Samples" standard errors tends to be greater when the two surveys have a panel in common.

Table A10. Dependent Sample Estimates of Standard Errors for Changes in Percentage of Households with Natural Gas Main Space Heating

	Survey Year and Panel			
	1980 Incoming	1982 Longitudinal	1982 Incoming	1984 Longitudinal
Percentage of Households with Natural Gas Main Heat	55.7	57.2	56.2	54.7
Standard Error	2.2	2.5	2.0	1.8
Change from 1980 Survey Incoming Panel	0.0	1.5	0.5	-1.0
Dependent Sample Standard Error	NA	.9	2.1	2.1
Change from 1982 Survey Incoming Panel	-0.5	1.0	0.0	-1.4
Dependent Sample Standard Error	2.1	2.3	NA	0.9

NA = Not Applicable

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, The Residential Energy Consumption Surveys, 1978, 1980, 1982 and 1984.

The difference between the independent samples standard error and the dependent samples standard error is not constant. It varies by the statistic and the surveys involved. Tables A11, A12, and A13 present the percentage drops from the independent samples standard error to the dependent samples standard error for several statistics involving average consumption. These tables can be used to approximate roughly the percentage drop for statistics where the independent samples standard error is available but the dependent samples standard error is not available. The independent samples standard error for many statistics can be estimated using the row column factors presented in the tables in Chapter 5. The dependent samples standard error is presented for only a limited number of statistics.

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Table A11. Comparison of Independent Samples Standard Errors and Dependent Samples Standard Errors for Changes in Consumption Between the 1982 RECS and the 1984 RECS

	Average Consumption			Standard Error of Change		Percentage Drop in Standard Error
	1982	1984	Difference	Independent Samples	Dependent Samples	
Total Energy Consumption						
National	102.9	104.7	1.7	2.2	1.1	47.9
North East	121.7	125.2	3.6	4.8	2.8	41.5
North Central	121.9	129.4	7.5	4.1	3.0	27.0
South	87.8	85.1	-2.7	4.9	2.0	58.4
West	83.7	85.0	1.3	3.1	1.9	39.2
Electricity Consumption						
National	28.9	28.8	-0.2	0.9	0.5	48.9
North East	21.2	22.3	1.1	1.3	0.6	53.6
North Central	27.0	25.2	-1.8	1.9	0.9	54.9
South	37.4	36.3	-1.1	1.7	1.1	34.1
West	25.5	27.4	1.8	1.4	0.8	41.1
Natural Gas Consumption						
National	88.1	89.9	1.8	2.1	1.4	32.4
North East	85.0	79.2	-5.9	5.8	4.2	26.4
North Central	110.2	118.0	7.8	4.0	3.1	22.4
South	77.7	80.3	2.7	4.8	2.5	48.1
West	74.4	73.2	-1.3	3.2	1.9	40.0
Fuel Oil/Kerosene Consumption						
National	73.4	71.9	-1.5	3.4	2.7	21.6
North East	89.7	97.3	7.6	3.8	3.8	1.7
North Central	64.3	49.1	-15.2	6.4	7.2	-12.3
South	45.0	35.0	-10.0	6.1	3.2	47.6
West	47.6	56.3	8.8	10.0	6.5	32.2
LPG Consumption						
National	39.4	40.1	0.7	3.3	2.6	21.3
North East	20.5	20.1	-0.4	4.3	3.9	8.2
North Central	60.4	69.7	9.2	6.8	7.8	-14.0
South	34.0	32.1	-1.9	4.8	3.5	26.6
West	42.7	39.4	-3.3	5.3	4.6	12.6

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, The Residential Energy Consumption Surveys, 1982 and 1984.

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Table A12. Comparison of Independent Samples Standard Errors and Dependent Samples Standard Errors for Changes in Consumption Between the 1980 RECS and the 1984 RECS

	Average Consumption			Standard Error of Change		Percentage Drop in Standard Error
	1980	1984	Difference	Independent Samples	Dependent Samples	
Total Energy Consumption						
National	114.2	104.7	-9.5	2.3	1.7	25.2
North East	137.7	125.2	-12.4	4.6	3.4	26.2
North Central	138.7	129.4	-9.3	4.1	4.4	-5.7
South	96.0	85.1	-10.9	4.7	2.4	50.1
West	86.3	85.0	-1.3	3.0	2.8	4.9
Electricity Consumption						
National	30.1	28.8	-1.4	0.8	0.4	44.9
North East	22.2	22.3	0.2	1.3	0.9	30.1
North Central	28.4	25.2	-3.2	1.6	0.9	42.9
South	39.3	36.3	-3.0	1.5	1.0	34.5
West	25.9	27.4	1.5	1.3	0.9	31.4
Natural Gas Consumption						
National	95.7	89.9	-5.8	2.2	1.8	20.0
North East	84.8	79.2	-5.6	6.5	3.5	46.7
North Central	129.8	118.0	-11.7	4.1	4.7	-13.3
South	83.8	80.3	-3.4	4.7	2.2	53.0
West	74.6	73.2	-1.4	3.1	2.6	16.3
Fuel Oil/Kerosene Consumption						
National	100.8	71.9	-28.9	3.4	3.4	0.6
North East	118.7	97.3	-21.4	4.1	4.6	-10.2
North Central	77.0	49.1	-28.0	5.8	6.3	-8.2
South	74.7	35.0	-39.6	7.5	5.2	31.5
West	63.5	56.3	-7.1	9.6	8.5	12.1
LPG Consumption						
National	47.6	40.1	-7.5	3.4	3.2	6.3
North East	21.3	20.1	-1.2	6.2	6.4	-3.6
North Central	73.3	69.7	-3.6	7.0	6.6	5.7
South	41.6	32.1	-9.4	4.8	4.7	1.7
West	49.4	39.4	-9.9	5.0	4.5	8.3

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, The Residential Energy Consumption Surveys, 1980 and 1984.

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Table A13. Comparison of Independent Samples Standard Errors and Dependent Samples Standard Errors for Changes in Consumption Between the 1980 RECS and the 1982 RECS

	Average Consumption			Standard Error of Change		Percentage Drop in Standard Error
	1980	1982	Difference	Independent Samples	Dependent Samples	
Total Energy Consumption						
National	114.2	102.9	-11.2	2.3	1.2	48.8
North East	137.7	121.7	-16.0	5.0	2.5	49.9
North Central	138.7	121.9	-16.8	4.4	2.7	38.1
South	96.0	87.8	-8.2	4.9	1.7	64.3
West	86.3	83.7	-2.6	2.9	1.9	33.5
Electricity Consumption						
National	30.1	28.9	-1.2	0.4	0.4	58.8
North East	22.2	21.2	-1.0	1.3	0.8	41.9
North Central	28.4	27.0	-1.5	1.8	0.8	57.2
South	39.3	37.4	-1.9	1.7	0.8	55.6
West	25.9	25.5	-0.4	1.5	0.6	62.8
Natural Gas Consumption						
National	95.7	88.1	-7.6	2.2	1.4	35.5
North East	84.8	85.0	0.2	6.8	4.1	40.4
North Central	129.8	110.2	-19.5	3.9	2.8	28.1
South	83.8	77.7	-7.1	4.3	2.4	44.0
West	74.6	74.4	-0.2	2.6	1.9	28.1
Fuel Oil/Kerosene Consumption						
National	100.8	73.4	-27.0	3.5	2.0	41.7
North East	118.7	89.7	-29.0	4.9	2.3	52.6
North Central	77.0	64.3	-12.7	6.7	6.7	-0.2
South	74.7	45.0	-29.7	7.4	3.8	48.5
West	63.5	47.6	-15.9	7.1	5.7	19.0
LPG Consumption						
National	47.6	39.4	-8.2	3.4	2.1	37.9
North East	21.3	20.5	-0.8	6.2	5.5	12.0
North Central	73.3	60.4	-12.9	7.8	5.3	31.6
South	41.6	34.0	-7.5	4.1	3.3	19.2
West	49.4	42.7	-6.6	5.8	4.1	29.1

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, The Residential Energy Consumption Surveys, 1980 and 1982.

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The cases where the percentage drop is negative should be treated as a zero percentage drop. The estimates of the dependent and the independent samples standard errors are themselves random variables. Even if the actual dependent samples standard error is less than the actual independent samples standard error, there will be some cases where by chance the estimate for the dependent samples standard error is greater than the estimate for the independent samples standard error, which forces the percentage drop to be negative. The percentage drop could be negative if the two estimates are negatively correlated. For the consumption estimates from RECS it is reasonable to assume that the correlation is positive or zero but not negative.

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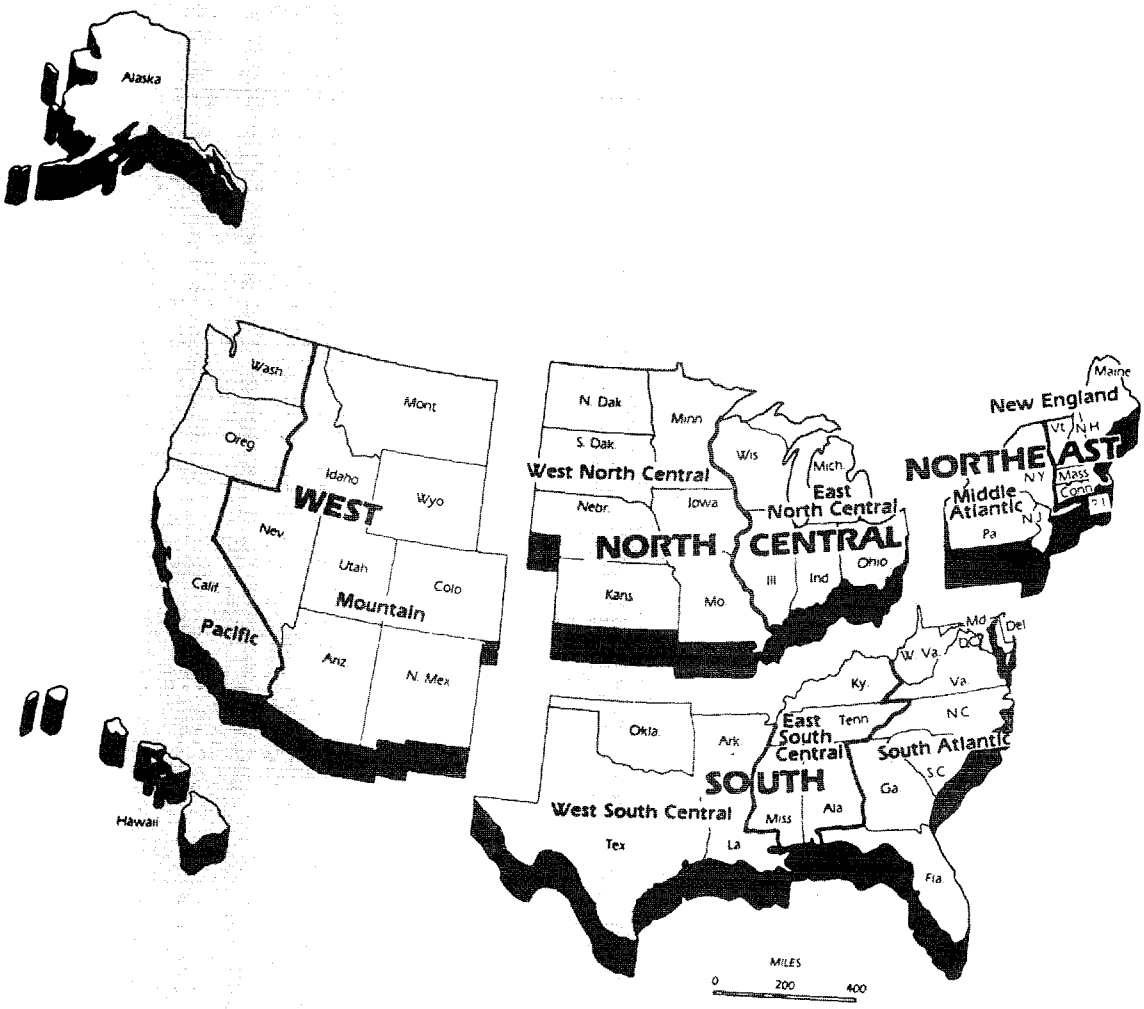
Appendix B

U.S. Census Regions

Appendix B

U.S. Census Regions and Divisions

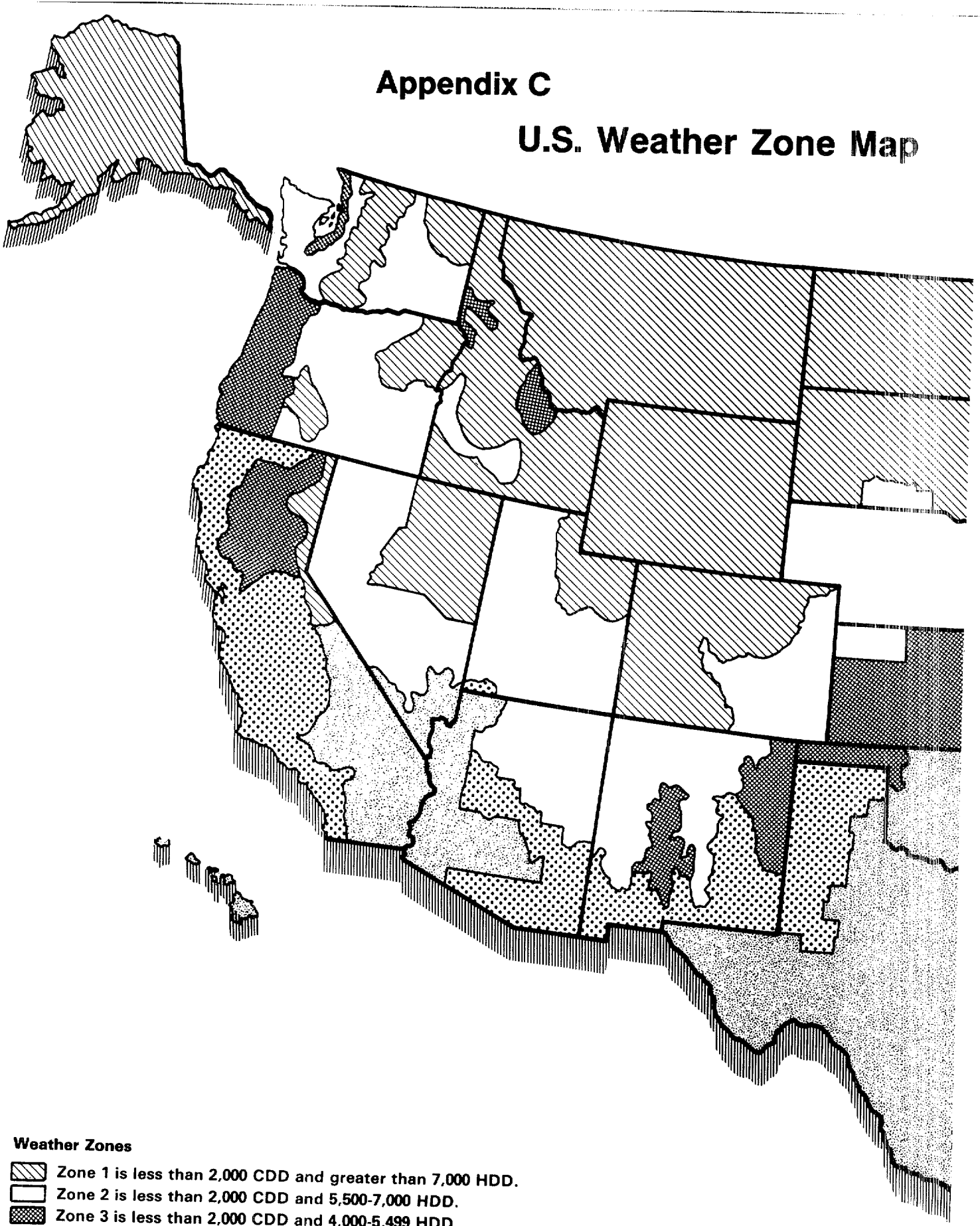


Appendix C

U.S. Weather Zones

Appendix C

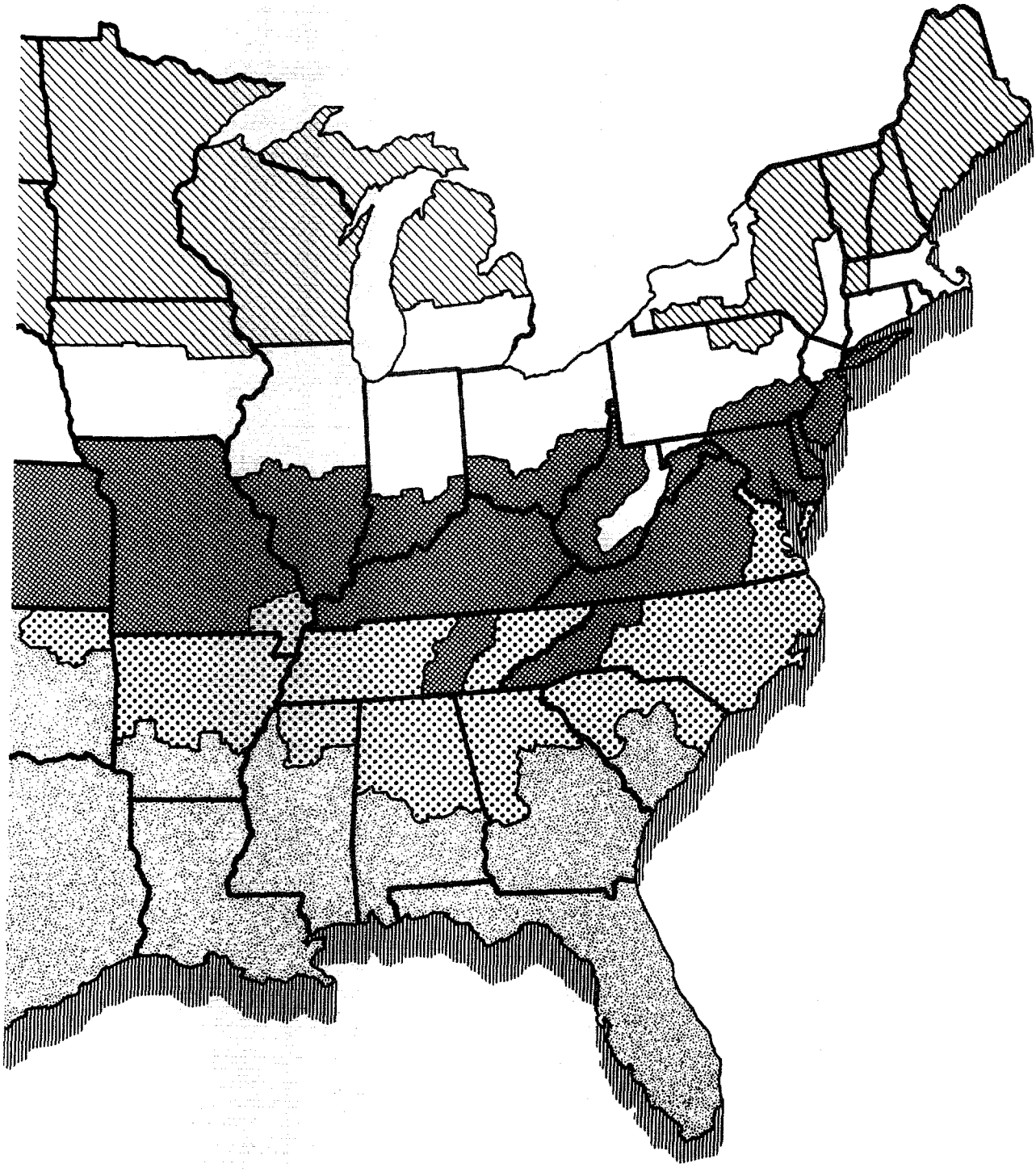
U.S. Weather Zone Map



Weather Zones

- Zone 1 is less than 2,000 CDD and greater than 7,000 HDD.
- Zone 2 is less than 2,000 CDD and 5,500-7,000 HDD.
- Zone 3 is less than 2,000 CDD and 4,000-5,499 HDD.
- Zone 4 is less than 2,000 CDD and less than 4,000 HDD.
- Zone 5 is greater than 2,000 CDD and less than 4,000 HDD.

Appendix C



Appendix D

Related Publications on Energy Consumption

Appendix D

Related Publications on Energy Consumption

Residential Sector

Housing Characteristics

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.).

Consumption and Expenditures

Residential Energy Consumption Survey: Consumption and Expenditures, April 1984 Through March 1985, Part 1: National Data ; March 1987, DOE/EIA-0321/1(84).

Residential Energy Consumption Survey: Consumption and Expenditures, April 1984 Through March 1985, Part 2: Regional Data ; May 1987, DOE/EIA-0321/2(84).

Residential Energy Consumption Survey: Consumption and Expenditures, April 1982 Through March 1983, Part 1: National Data ; November 1984, DOE/EIA-0321/1(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-0321/2(82), GPO Stock No. 061-003-00414-8, $9.50.

Appendix D

Residential Energy Consumption Survey: Consumption and Expenditures, April 1981 Through March 1982, Part 1: National Data ; September 1983, DOE/EIA-0321/1(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-0321/2(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

Residential Energy Consumption Survey: Trends in Consumption and Expenditures 1978-1984 (Forthcoming).

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. 061-003-00347-8, $5.00.

National Interim Energy Consumption Survey: Exploring the Variability In Energy Consumption; July 1981, DOE/EIA-0272, GPO Stock No. 061-003-00205-6, $5.00.

National Interim Energy Consumption Survey: Exploring 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.).

Appendix D

Residential Transportation Sector

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

Characteristics of Buildings

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: 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

Nonresidential Building Energy Consumption Survey: Commercial Buildings, Consumption and Expenditures 1983; October 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.

Appendix D

Industrial Sector

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.).

Cross-Sector

Natural Gas: Use and Expenditures; April 1983, DOE/EIA-0382, GPO Stock No. 061-003-00307-9, $5.50.

Note: Prices are subject to change.

See inside front cover for information concerning copies of these publications.

Glossary

Glossary

Adjusted Electricity: See Electricity.

Air Conditioning: Cooling of air by a refrigeration unit powered by electricity or gas. This does not include fans, blowers, or evaporative cooling systems or "swamp coolers" that are not connected to a refrigeration unit. Air-conditioning units that are not currently in working condition or are not used, but are in place in the housing unit, are included in the surveys.

All-Electric Home: A home in which electricity is the main source of energy for space heating, water heating, and cooking. Other fuels may be used for supplementary heating or for other purposes.

Annual Consumption Period: A 365-day period beginning as close as possible to April 1 of the survey year. For natural gas and electricity, the actual beginning date for a household may have varied from April 1 in either direction by several weeks, depending on the household's billing cycle. For fuel oil or kerosene and LPG, the beginning date was always April 1, but the amounts represent deliveries received by the household during the 365-day period, not gallons consumed. (The expenditures for fuel oil or kerosene and LPG represent expenditures for the amount of fuel delivered to the home, not the amount of fuels consumed.) See Expenditures and Consumption.

Annual Family Income: See Family Income.

Appliance: A device or instrument designed for household use. "Appliances used" is defined in the surveys as those possessed and used by the household during the year. Appliances possessed by the household but not used are not counted, except that air-conditioned units are included whether or not they are used. Appliances loaned to the household for its regular use are included. 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.

In the 1978 survey, the following appliances (if used in the home) were specifically included: refrigerator, cooking appliances (small electric appliances as a single category, oven, range, or grill), washing machine, dishwasher, freezer, dryer, and outdoor gas light. In the 1979 survey, specific appliances were not listed, but questions were asked about fuels used for "cooking" and "other appliances."

In the 1980 and 1981 surveys, the following appliances (if used in the home) were specifically included: swimming-pool heater, refrigerator, freezer, cooking appliances (oven, range, and small appliances), outdoor gas grill, clothes washer, dishwasher, clothes dryer, outdoor gaslight, dehumidifier, humidifier, evaporative cooler (swamp cooler), black-and-white television set and color television set. In the 1982 survey, "whole house" cooling fan and window or ceiling fan were added to the list of appliances covered in the two previous surveys. In the 1984 survey, "electric blanket" and "water bed with heater" were added, the category "outdoor gas grill" was made into two categories, one for natural gas and one for LPG, and an open-ended question was added that asked for other appliances that used "a lot" of energy.

Glossary

"Swimming-pool heater" applies only to swimming pools that are for exclusive use of the housing unit. Swimming pools in apartment buildings, condominiums, or cooperatives that are for the use of many residential households are not included. Ponds, or children's wading pools are not included. Hot tubs and jacuzzis were not included in 1982 or earlier surveys but were included in 1984. "Oven" does not include toaster ovens. An "evaporative cooler" (swamp cooler) is a unit that moistens and cools air by saturating it with water vapor. A "freezer" is a freezing unit that is a separate appliance from the refrigerator. A "frost-free" freezer or refrigerator is one that does not require defrosting, because frost does not build up inside the freezing compartment. Refrigerators without freezer sections are included in the nonfrost-free category.

Availability of Natural Gas in the Neighborhood: Ability of a household to hook up to a gas line. Respondents who did not use natural gas answered "yes," "no," or "don't know" to the question, "Is gas from underground pipes available in this neighborhood?" Because respondents were not provided with a definition of "availability" or "neighborhood," some variation is expected in the concepts understood by each respondent. The intent of this question was to determine whether a household could hook up to a gas line. In the 1978 and 1979 survey, this question was not asked. In the 1980 survey, this question was asked only of households living in single-family or mobile homes. In post-1980 surveys, this question was asked of all households.

Btu (British Thermal Unit): A measure of the heat content of various fuels. An average Btu content of a fuel is a heat value per unit quantity of the fuel as determined from tests of fuel samples. A Btu is the amount of energy required to raise the temperature of 1 pound of water 1 degree Fahrenheit at or near 39.2 degrees Fahrenheit and 1 atmosphere pressure. One Btu is equivalent to about 252 calories, or approximately the amount of heat given off by a blue-tip match.

In this report, figures for household energy consumption combine different fuels on the basis of Btu content. The following Btu conversion factors have been used in the surveys summarized in this report:

Site Electricity .....3,412 Btu per kilowatthour (all RECS).

Adjusted Electricity .....10,236 Btu per kilowatthour (see Electricity).

Natural Gas .....1,021 Btu per cubic foot (1978, 1979, and 1980 RECS).
1,027 Btu per cubic foot (1981 and 1982 RECS)
1,031 Btu per cubic foot (1984 RECS)

Fuel Oil .....135,000 Btu per gallon - Fuel Oil No.1
135,000 Btu per gallon - Kerosene
138,690 Btu per gallon - Fuel Oil No.2
(1980, 1981, 1982, and 1984 RECS)
138,690 Btu per gallon (includes Kerosene)
(1978 and 1979 RECS).

LPG (propane) .....91,330 Btu per gallon (1980, 1981, 1982, and 1984 RECS)
91,500 Btu per gallon (1978 and 1979 RECS)

Glossary

Other conversion factors: 1 therm = 100,000 Btu
1 barrel = 42 gallons.

Because almost all LPG reported by fuel suppliers was propane, the LPG conversion factors used were those for propane.

CDD: See Cooling Degree-Days.

Census Division: An area consisting of various States selected by the U.S. Bureau of the Census according to the population, size, and physical location. The States are grouped into nine divisions and four regions: (See map in Appendix B.)

Region	Division	States
Northeast	New England	Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont
Northeast	Middle Atlantic	New Jersey, New York, and Pennsylvania
North Central	East North Central	Illinois, Indiana, Michigan, Ohio, and Wisconsin
North Central	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
South	East South Central	Alabama, Kentucky, Mississippi, and Tennessee
South	West South Central	Arkansas, Louisiana, Oklahoma, and Texas
West	Mountain	Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming
West	Pacific	Alaska, California, Hawaii, Oregon, and Washington (the sample for 1978 and 1979 did not include Alaska or Hawaii.)

Census Region: See Census Division or the map in Appendix B.

Consumption: The amount of electricity or natural gas used by the household during the 365-day period covered by the survey. For fuel oil, kerosene, and LPG, consumption represents the quantity of fuel purchased, not fuel consumed. If the level of fuel in the household's fuel tank was the same at the beginning as at the 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 data collection.) See Annual Consumption Period and Expenditures.

Glossary

Cooling Degree-Days (CDD): A quantity used to estimate the need for cooling systems in buildings. Normally, cooling is not required in a building when the outdoor average daily temperature is below 65 degrees. (The average daily temperature is the mean of the maximum and minimum temperatures for a 24-hour period.) Cooling degree-days are determined by substracting 65 from the average daily temperature. For example, a day with an average temperature of 85 degrees has 20 cooling degree-days (85 - 65 = 20), while a day with an average temperature of 65 degrees or lower has none. After being calculated for each day, the number of cooling degree-days can be summed over a larger unit of time (a month, a year).

Cooling degree-days can also be calculated using a base temperature other than 65 degrees. The computation is performed in an analogous manner. The cooling degree-days based at temperatures higher than 65 degrees may be a more accurate measure of the demand for air conditioning. The appropriate base to use may vary from household to household depending on the ability of the structure to keep out the heat during the day, the amount of heat generated in the dwelling by appliances, and the desired indoor temperature. This report uses cooling degree-days based at 65 degrees because that is the base for which cooling degree-days are most commonly reported.

Cooling degree-days for RECS households in the 48 contiguous States and the District of Columbia were assigned according to the NOAA division in which each household was located. For households in Alaska and Hawaii, cooling degree-days were assigned by appropriate nearby weather stations. See NOAA Division, Weather Zone.

Electricity: Metered electric power supplied by a central utility company to a residence via underground or aboveground power lines. Electricity generated onsite for the exclusive use of the residence is not included (in this case, the fuel used for the generator would be reported).

In this report, a distinction is made between "site-electricity" and "adjusted electricity" in comparing the price or consumption of electricity with those of other fuels on the basis of Btu content. The Btu values and prices for "site-electricity" are based on the electricity consumption reported in the surveys in terms of actual kilowatthours metered at the site of consumption (the housing unit). However, electricity is a derived energy source, usually generated from energy produced by burning other fuels, and it takes several Btu of the "primary" fuel burned to produce 1 Btu of electricity at the site of consumption. Hence, electricity has a much higher price in dollars per Btu than other fuels, and a direct comparison of "site-electricity" consumption or prices with those for other fuels can be misleading. Therefore, for more realistic comparisons, "site-electricity" is converted to "adjusted electricity" by multiplying its Btu value by a factor of 3. This conversion factor of 3 is a rough approximation of the Btu content of fossil fuels used to generate electricity in a steam-generation power plant (See Energy Information Administration, Monthly Energy Review, "Conversion Factors," DOE/EIA). This conversion has the effect of reducing the price of "adjusted electricity" by a factor of 3. See Fuel.

Glossary

Expenditures: The amount paid for electricity or natural gas consumed during the 365-day period covered by the survey. For households on a budget plan, the expenditures are for actual consumption. Expenditures for fuel oil, kerosene, and LPG are for the amount of fuel purchased during the 365-day period, which may differ from the amount of fuel consumed. For households that do not pay their fuel suppliers directly, expenditures for fuels are estimated. Expenditures include State and local taxes, but exclude merchandise, repairs, or special service charges. See Consumption and Annual Consumption Period.

Family Income: The total combined income during the calendar year preceding the survey year for all members of the family from all sources, before taxes and deductions. This includes wages, salaries, tips, commissions, and income from Social Security, pensions, interest, dividends, rent, public assistance, and unemployment insurance. The family income includes the total income for all family members who lived in the household during the year preceding the survey year, regardless of whether they were living there at the time of the survey interview. Income of nonfamily members of the household is not included. "Family" includes mother, father, sister, brother, son, daughter, father-in-law, uncle, aunt, niece, grandchild, foster child, and similar relationships.

For each survey year except 1984, family income is reported in the dollars of the preceding year (for example, family incomes reported in the 1980 survey represent 1979 calendar year income in 1979 dollars). There is no overlap in any case between the period represented by family income and the period represented by consumption (for example, consumption reported in the 1980 survey is for April 1980 through March 1981, whereas family income reported in the same survey is for January 1979 through December 1979). The 1984 survey recorded income for the 12 months prior to the interview (November 1984 was the midpoint of interviewing), so there is an overlap between April 1984 and the date of the interview for income and consumption.

Fuel: An energy source delivered to a residential site. The fuel may be consumed directly to produce energy, or it may be converted at the site into some other form. Electricity is included in this report as a fuel. See Btu and Major Fuels.

"Electricity" refers to metered electric power supplied by a central utility company to a residence via underground or aboveground power lines. The Btu equivalent for electricity is the energy value of electricity as received by the household (site) (3,412 Btu per kilowatthour). To take into account the Btu content of energy used to produce electricity, an adjusted-electricity value is also used in this report. The adjusted value is 3 times the site value of electricity. See Electricity.

"Fuel oil" refers to No. 1, No. 2, or No. 4 grade fuel oil or residual oil that is burned for space or water heating. No. 1 distillate fuel oil is a form of heating oil used mostly as a blending stock to assure that heavier grades of fuel will flow in severe cold weather. No. 2 distillate collectively refers to No. 2 heating oil and No. 2 diesel fuel. Although these products are not identical, they are interchangeable in most applications. No. 2 fuel oil is the most common form of heating oil. No. 4 distillate is a blend of No. 2 and No. 5 or No. 6

Glossary

residual fuel oil used in large stationary diesel engines and boilers equipped with fuel-preheating equipment. "Residual fuel oil" refers to the heavier oils that remain after the distillate fuel oils and lighter hydrocarbons have been boiled off in refinery operations.

"Kerosene" refers to a distilled product of oil or coal with the generic name "kerosene." Kerosene is similar to No. 1 distillate fuel oil and is used for space heating or water heating or for lighting equipment using wicks. It is sometimes sold under the names "range oil," "stove oil," and "coal oil."

"LPG" or "liquefied petroleum gas" refers to any fuel gas supplied to a residence in liquid form. Almost all LPG reported by fuel suppliers is propane. It is usually delivered by tank truck and stored near the residence in a tank or cylinder until used. Household use of LPG solely for outdoor gas grills is not considered sufficient to mark the household as a user of the fuel.

"Natural gas" refers to utility gas supplied by underground pipeline from a central utility company to individual housing units. Gas from privately owned gas wells operated by the household is not included.

"Wood" refers to any amount of wood burned in a home fireplace, stove, or furnace to produce heat.

Fuel Oil: See Fuel.

HDD: See Heating Degree-Days.

Heat Pump: A year-round heating and air-conditioning system in which refrigeration equipment supplies both heating and cooling through ducts leading to individual rooms (also referred to as a "reverse cycle system"). It generally consists of a compressor, both indoor and outdoor coils, and a thermostat.

Heating Degree-Days (HDD): A quantity used to estimate the need for heating systems in buildings. Normally, heating is not required in a building when the outdoor average daily temperature is above 65 degrees. (The average daily temperature is the mean of the maximum and minimum temperature for a 24-hour period.) Heating degree-days are determined by subtracting the average daily temperature below 65 degrees from the base 65. For example, a day with an average temperature of 50 degrees has 15 heating degree-days (65 - 50 = 15), while one with an average temperature of 65 or higher has none.

Heating degree-days can also be calculated using a base temperature other than 65 degrees. The computation is performed in an analogous manner. The heating degree-days based at temperatures lower than 65 degrees may be a more accurate measure of the demand for space heating. The appropriate base to use may vary from household to household depending on the ability of the structure to retain heat, the amount of heat generated in the dwelling by appliances, and the desired indoor temperature. This report uses heating degree-days based at 65 degrees because that is the base for which heating degree-days are most commonly reported.

Glossary

The heating degree-days for RECS households in the 48 contiguous States and the District of Columbia were assigned according to the NOAA division in which each household is located. Heating degree-days for households in Alaska and Hawaii were assigned by appropriate nearby weather stations. See NOAA Division and Weather Zone.

Household: A family, an individual, or a group of up to nine unrelated persons occupying the same housing unit. "Occupying" means that the housing unit was the individual's usual or permanent place of residence at the time of the first field contact. The household includes babies, lodgers, boarders, employed persons who live in the housing unit, and persons who usually live in the housing unit but are away traveling or in a hospital. The household does not include 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. By definition, the count of households is the same as the count of occupied housing units. See Housing Unit.

Household Head: The individual responding to the survey; if the respondent was married and living with his or her spouse, the male was considered to be the household head.

Housing Structure: One of four structure types used to categorize the building in which a housing unit is located. See Housing Unit.

"Single-family housing unit" refers to a structure that provides living space for one household or family. The structure may be detached, attached on one side (semi-detached), or attached on two sides. An attached house is considered a single-family house as long as the house 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. (In the 1982 and 1984 surveys, a mobile home with one or more rooms added was classified as a single-family home.)

"House or building with two to four housing units" refers to a structure that is divided into living quarters for two, three, or four families or households. 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 living quarters of this type are separate apartments, downstairs and upstairs apartments, and one apartment on each of three or four floors.

"Building with five or more housing units" refers to a building containing living quarters for five or more separate households or families.

"Mobile home" or "trailer" refers to a structure that has all the facilities of a dwelling unit but is built on a movable chassis. It may be placed on a permanent or temporary foundation and may contain one or more rooms. In the 1978, 1979, 1980, and 1981 surveys, a structure was still considered a mobile home even if rooms had been added. This definition was changed in the 1982 and 1984 surveys, so that a mobile home with one or more rooms added was classified as a single-family housing unit.

Glossary

Housing Unit: A structure or part of a structure in which a household (family or individual) lives or could live. It is accessible directly from the outside of the building or through a common hall. Group quarters, such as prisons, hospitals, dormitories, nursing homes, fraternity houses, or convents, where 10 or more unrelated persons live, are not included. Hotel rooms, motel rooms, and mobile homes or trailers are considered housing units when occupied by a household.

Kerosene: See Fuel.

Liquefied Petroleum Gas or LPG: See Fuel.

Main Space Heating Fuel: The fuel named by the respondent in answer to the question, "What is the main fuel used for heating your home?"

Main Water Heating Fuel: The fuel named by the respondent in answer to the survey question, "Which fuel is used most for heating water?" The phrase, "other than just for cooking purposes," was added to the 1982 and later surveys to make it clear that the question refers to hot water used for bathing and washing. Households that did not have running water in their homes were also asked this question.

Major Fuels: Electricity, natural gas, fuel oil or kerosene, and liquefied petroleum gas (LPG). Wood is not included as a major fuel, primarily because (1) the available data for wood-fuel consumption are not as high in quality as the data for the other fuels, (2) expenditure data are not available for wood, and (3) in the 1978 and 1979 surveys no data on wood-fuel consumption were collected. See Fuel.

Measured Heated Area of Residence: The floor area of the housing unit that is enclosed from the weather. Basements are included whether or not they contain finished space. Garages are included if they have a wall in common with the house. Attics that have finished space and attics that have some heated space are included. Crawl spaces are not included, even if they are enclosed from the weather. Sheds and other buildings that are not attached to the house are not included. "Measured" area means that the measurement of the dimensions of the home were not based on the respondent's reports, but was an actual measurement by the interviewer using a metallic, retractable, 50-foot tape measure. "Heated area" is that portion of the measured area that is heated during most of the season. Rooms that are shut off during the heating season to save on fuel use are not counted as heated area. Attached garages that are unheated and unheated areas in basements and attics are not counted as heated area. Housing units were not measured in the 1978 and 1979 surveys.

Natural Gas: See Fuel.

NOAA Division: One of the 344 weather divisions designated by the National Oceanic and Atmospheric Administration (NOAA) encompassing the 48 contiguous States and the District of Columbia. These divisions usually follow county borders to encompass counties with similar weather conditions. The NOAA divisions do not follow county borders when weather conditions vary considerably

within a county, as is likely to happen when a county borders the ocean or contains high mountains. On the average, each State contains seven NOAA divisions, and each NOAA division includes nine counties.

Number of People in Household: See Household.

Occupied Housing Unit: A housing unit that was occupied by someone as his or her usual or permanent place of residence at the time of the first field contact in a given survey.

Ownership Status: The status of a household--as owner or renter--with regard to the housing structure occupied (not the land on which it is located). The household is classified as "renter" even if the rent is paid by someone outside the household or if the housing structure is occupied rent free, unless this status is shown as separately. "Rent free" means that the unit is not owned or being bought, and no money is being 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.) "Rent free" also includes occupants who pay only for utilities. The household is classified as "owner" if the owner or co-owner of the housing unit is a household member, even if the unit is mortgaged or not fully paid for.

Panel: Either of two subsets of sample clusters for the 1980 RECS, the 1982 RECS or the 1984 RECS. The set of housing units in each subset is itself a national sample. For a given survey, the two panels are denoted as the longitudinal panel and the incoming panel. The longitudinal panel for the 1982 RECS corresponds to the incoming panel for the 1980 RECS, and the longitudinal panel for the 1984 RECS corresponds to the incoming panel for the 1982 RECS. In general, a panel survey is one in which the sample unit is reinterviewed. In this report, the panel includes some housing units where only one interview occurred. This happened because housing units were constructed, rehabilitated, or torn down in between interviews and the occupants of some units responded to one survey, but not to the other.

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 1,800 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.

Residential: Refers to occupied housing units, including mobile homes, single-family housing units (attached and detached), and apartments. The definition of housing units used in this report and in the reports of the surveys summarized here is the same as that used by the Bureau of the Census. See Household, Housing Structure, and Housing Unit.

RSE or Relative Standard Error: A measure of the reliability or precision of the survey statistics we used. Variability occurs in survey statistics because the different samples that could be drawn would each produce different values

for the survey statistics. Relative Standard Error, or RSE is a measure of precision on a percentage scale. The RSE is defined as the standard error of a survey estimate, divided by the survey estimate and multiplied by 100. (Standard error is the square root of the variance.) For example, an RSE of 50 percent means that the standard error is half as large as the survey estimate. (See Appendix A, "Quality of the Data," for a discussion of sampling errors.)

RSE Column Factor: An adjustment factor that appears with each column of the main tables 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 particular "cell." (See RSE, RSE Row Factor, and the section on Sampling Errors in Appendix A.)

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 the 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 particular "cell." (See RSE, RSE Column Factor, and the section on Sampling Errors in Appendix A.)

Site-Electricity: See Electricity.

Weather Zone: One of seven distinct areas, designated by the American Institute of Architects (AIA) for the U.S. Department of Energy and the U.S. Department of Housing and Urban Development, that are used to classify housing units or buildings by long-term weather conditions. The zones are defined by the annual sums of heating degree-days (HDD) and cooling degree-days (CDD) averaged over 45 years, as follows:

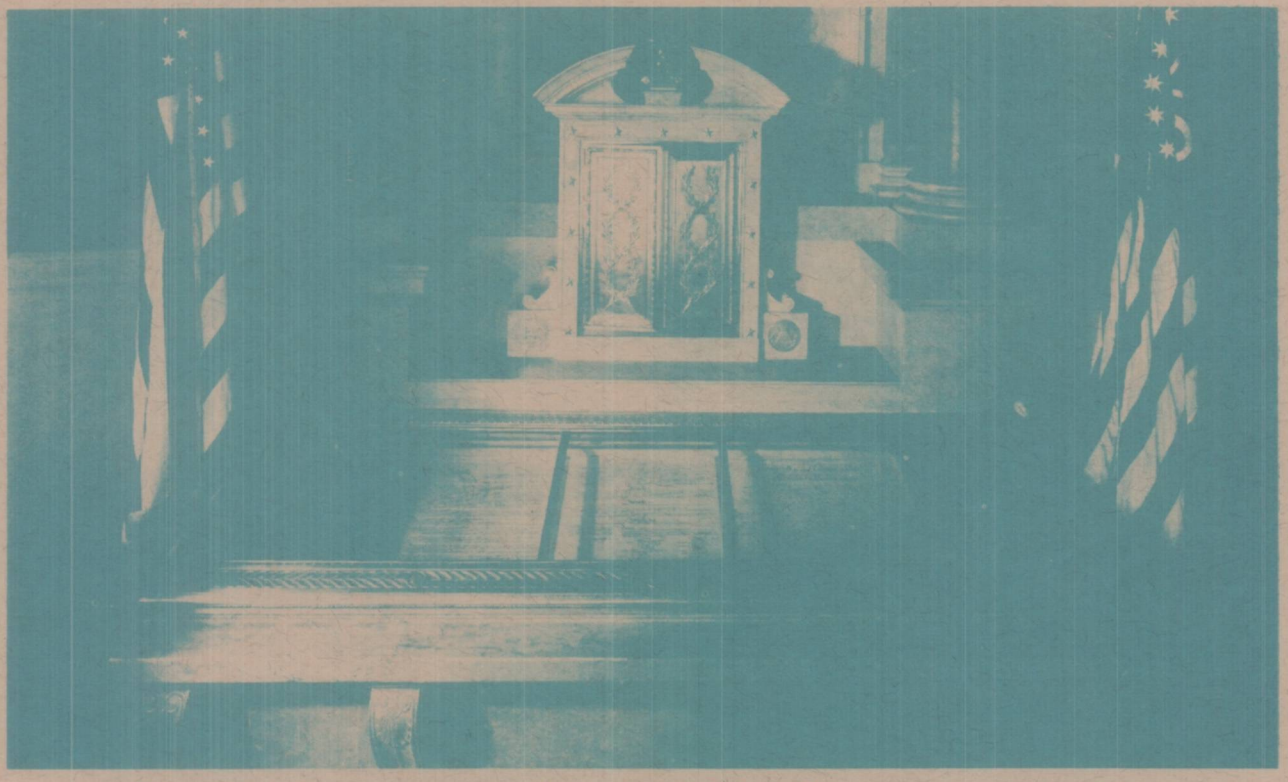
Zone 1 has fewer than 2,000 CDD and more than 7,000 HDD.
Zone 2 has fewer than 2,000 CDD and 5,500 to 7,000 HDD.
Zone 3 has fewer than 2,000 CDD and 4,000 to 5,499 HDD.
Zone 4 has fewer than 2,000 CDD and 2,000 to 3,999 HDD.
Zone 5 has fewer than 2,000 CDD and fewer than 2,000 HDD.
Zone 6 has more than 2,000 CDD and fewer than 2,000 HDD.
Zone 7 has more than 2,000 CDD and 2,000 to 3,999 HDD.

Zones 4 and 5 and Zones 6 and 7 were combined for this report. A building was assigned to a weather zone on the basis of its geographic location. See Heating Degree-Days, Cooling Degree-Days, and NOAA Division.

Year of Construction: The year the original structure was completed or when any part of the structure was first occupied. Year of construction does not refer to the date of a later remodeling, addition, or conversion. For a mobile home, year of construction is the model year.

THE PRESIDENT DOESN'T TAKE AN OATH TO DEFEND THE AMERICAN FLAG OR THE STATUE OF LIBERTY.

The President takes an oath to defend something even more important than a majestic symbol of our country.



The President takes an oath to defend the Constitution of the United States. A document that has been described as the greatest leap forward for freedom in human history. A document that is the foundation of our country. And the means by which we achieve the rule of law and protect our freedom.

As we commemorate the Bicentennial of the Constitution, there is no better way for you as an American to reaffirm the principles for which our country stands than to learn more about the Constitution.

The words we live by.

THE CONSTITUTION

The words we live by

To learn more about the Constitution write: Constitution, Washington, D.C. 20599. The Commission on the Bicentennial of The U.S. Constitution. Ad Council

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