

# Household Energy Consumption and Expenditures 1987

Part 1: National Data



Energy  
Information  
Administration

Residential Energy Consumption Survey

Cover Caption: *The single-family home, mobile home, rowhouses and apartment buildings are examples of sampled housing units in the Residential Energy Consumption Survey.*

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# Household Energy Consumption and Expenditures 1987

## Part 1: National Data

**Energy Information Administration**  
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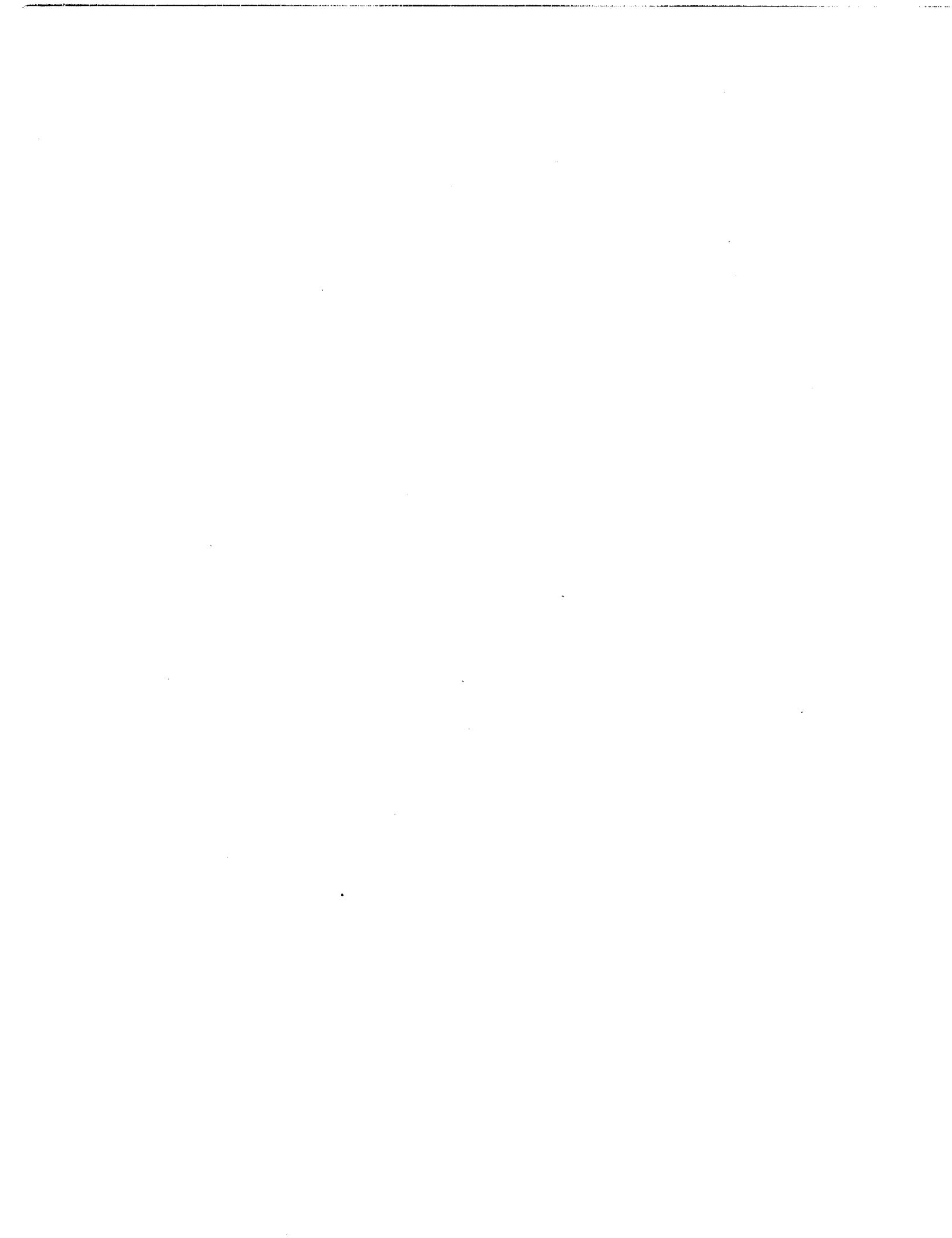
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# Executive Summary

Residential energy consumption and expenditure patterns were different in 1987 than in previous years. In contrast to previous RECS findings, the 1987 RECS reported an increase in average household electricity consumption and a decrease in average household energy expenditures. These findings are from the 1987 Residential Energy Consumption Survey (RECS), conducted by the Energy Information Administration (EIA).

Other key findings include:

- Nationally, over one-half of all household energy is used for space heating.
- In 1987, households used more energy for air conditioning and less energy for space heating and water heating compared with 1984. This difference in consumption patterns was due partially to warmer weather in both the summer and winter months.
- The decrease in space-heating consumption was more pronounced among households that heated with natural gas or electricity.
- The per household amount of energy used for electrical appliances was greater in 1987 than 1984, while less energy was used for natural gas appliances in 1987 than in 1984.
- In housing units constructed in 1980 or after, the average heating intensities (Btu per square foot and per heating degree-day) of all main space-heating fuels was significantly lower than in homes constructed in the 1950's and 1960's.
- The elderly used more energy for space heating and less energy for water heating, air conditioning, and appliances than the nonelderly.

This is the second report based on 1987 RECS data. The 1987 RECS, the seventh in a series of national surveys of households and their energy suppliers, provides baseline information on how households in the United States use energy. A randomly selected set of housing units that includes single-family detached homes, townhouses, apartment buildings, condominiums, and mobile homes were selected for the survey. Data from the RECS and a companion survey, the Residential Transportation Energy Consumption Survey, are available to the public in published reports such as this one and on public use tapes.<sup>1</sup>

Table ES1 summarizes energy consumption and expenditures for 1978, 1981, 1984, and 1987 and allows the reader to discern household trends. Between 1978 and 1987, total energy consumption decreased by 14 percent while the number of households increased by 18 percent. This decline in consumption shows the strong effect of past energy conservation efforts.<sup>2</sup> Figure ES1 shows the proportion of household energy that was used for space heating, water heating, air conditioning, and appliances in 1987.

<sup>1</sup>See Appendix G, "Related EIA Publications on Energy Consumption" for a list of EIA publications available concerning the consumption of energy.

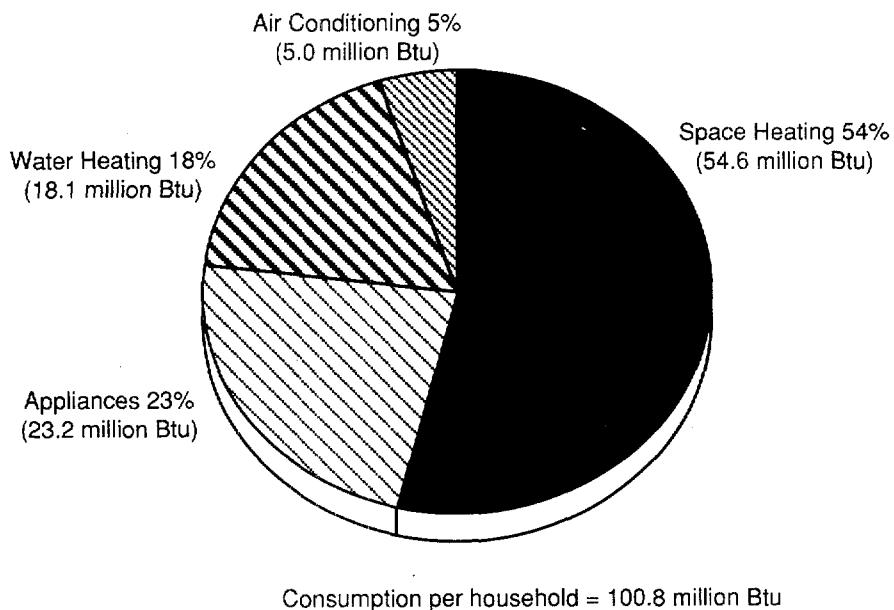
<sup>2</sup>The trend, not adjusted for weather effects, may be slowing since 1987 RECS data indicate increased usage of household air conditioning and heating systems since 1985.

**Table ES1. U.S. Household Energy Consumption and Expenditures for 1978, 1981, 1984, and 1987**

|  | 1978  | 1981  | 1984  | 1987  |
|--|-------|-------|-------|-------|
| <b>Total Households (million)</b>      | 76.6  | 83.1  | 86.3  | 90.5  |
| <b>Energy Consumption</b>              |       |       |       |       |
| Total (quadrillion Btu)                | 10.6  | 9.5   | 9.0   | 9.1   |
| Average (million Btu per household)    | 137.9 | 114.4 | 104.7 | 100.8 |
| <b>Energy Expenditures</b>             |       |       |       |       |
| Total (billion dollars)                | 55.5  | 85.0  | 97.0  | 97.7  |
| Average (dollars per household)        | 724   | 1,022 | 1,123 | 1,080 |
| <b>Price (dollars per million Btu)</b> |       |       |       |       |
| All Fuels                              | 5.26  | 8.93  | 10.73 | 10.71 |
| Natural Gas                            | 2.69  | 4.55  | 5.97  | 5.41  |
| Electricity                            | 11.85 | 18.51 | 21.94 | 22.34 |
| Fuel Oil/Kerosene                      | 3.93  | 8.89  | 7.64  | 5.89  |
| Liquefied Petroleum Gas                | 5.05  | 8.74  | 9.91  | 8.91  |

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, the 1978, 1981, 1984 and 1987 Residential Energy Consumption Surveys.

**Figure ES1. U.S. Energy Consumption per Household by End Use, 1987**



Notes: • End-use estimates are based on the 1987 Residential Energy Consumption Survey and were obtained using a nonlinear regression technique. • The electricity component is site electricity. No adjustment was made for the primary fuels consumed to produce the electricity. See "Glossary" for definition of site energy. • Data may not sum due to rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, 1987 Residential Energy Consumption Survey.

# Introduction

*Household Energy Consumption and Expenditures 1987, Part 1: National Data* is the second publication in a series from the 1987 Residential Energy Consumption Survey (RECS). It is prepared by the Energy End Use Division (EEUD) of the Office of Energy Markets and End Use (EMEU), Energy Information Administration (EIA). The EIA collects and publishes comprehensive data on energy consumption in occupied housing units in the residential sector through the RECS.

## Background

The data for this report are based both on the household interviews from the 1987 RECS, conducted in the fall of 1987, and on energy billing data collected from the households' energy suppliers in early 1988. The billing data cover the 12-month period from January 1987 through December 1987. The 1987 RECS represents 90.5 million households in the 50 States and the District of Columbia.

The RECS is a national multistage probability sample survey currently conducted on a triennial basis. The 1987 RECS is the seventh survey in the series. Previous RECS were conducted annually from 1978 to 1982 and then in 1984. The RECS data are collected in two stages. In the first stage, household characteristics data are collected via a personal interview with the household. At the end of that interview, the respondent is asked to sign an authorization form allowing the suppliers of energy to the household to release household billing information to the survey contractor. The second stage of RECS is a mail survey requesting household energy consumption and expenditure information from the energy suppliers. The RECS includes both a longitudinal component that measures energy changes over time and a subsample that provides information on residential vehicles. The longitudinal component collects data on the same housing units in two subsequent surveys. The transportation subsample is drawn from the RECS based on initial information on household vehicles. Additional vehicle-related data are then collected in the Residential Transportation Energy Consumption Survey (RTECS) and reported in the publication titled *Household Vehicles Energy Consumption 1988* to be published at the end of 1989. The EIA also conducts energy consumption surveys in the commercial and manufacturing sectors. See Appendix G,

"Related EIA Publications on Energy Consumption" for a listing of publications from the RECS and other EIA surveys in the residential transportation, commercial, and manufacturing sectors.

This report covers household energy consumption, expenditures, and prices for natural gas, electricity, fuel oil and kerosene, and liquefied petroleum gas (LPG) as well as household wood consumption. Data are presented in the form of aggregate totals and household averages. Also included are estimates of consumption and expenditures for the four end uses of residential energy: space heating, air conditioning, water heating and appliances. The values presented for the end-use estimates are based on the 1987 RECS and are disaggregations of actual bills using a nonlinear regression technique. (See Appendix B, "End-Use Estimation Methodology" for details on the procedures used to calculate the end-use estimates.)

Measures of energy use are also presented in the form of heating and air-conditioning intensities. These intensities are ratios of consumption to weather and floorspace. The values for space-heating intensities are presented as Btu or cents for space heating per heating degree-day (HDD) and per heated square foot. Values for air conditioning are presented as Btu or cents for air conditioning per cooling degree-day (CDD) and per cooled square foot. (See Appendix C, "Quality of the Data" for a comparison of the methods used to calculate the 1984 and 1987 Btu per HDD and per square foot.)

*Housing Characteristics 1987*, published in May 1989, was the first report based on the 1987 RECS. It focused on the energy-related characteristics of housing units and the change in household attitudes toward energy usage and conservation since 1984. Energy characteristics included type, size, and age of the housing structure; energy sources used for main and secondary heating; types of heating and air-conditioning equipment; types of appliances, insulation and retrofits; thermostat settings and uses of air-conditioning equipment. Household demographic data and climate data were also included.

A third report, titled *Household Energy Consumption and Expenditures 1987, Part 2: Regional Data*, is planned for release in late 1989. It will contain consumption, expenditure and price data by Census region and Census division.

The data presented in this report provide objective, accurate energy information for a wide audience including Congress, Federal and State agencies, industry, and the general public. The data presented were collected and published by the EIA to fulfill its responsibilities as specified in the Federal Energy Administration Act of 1974 (Public Law 93-275), as amended.

The statistics published in this report are based on a sample from the population of all residential housing units in the United States as of November 1987. As a result, all the numbers are estimates rather than exact measures for the population. As described in Appendix C, "Quality of the Data," the accuracy of each estimate is indicated by the relative standard error (RSE). In general, no estimates were published that were based on fewer than 10 sample households or that had an RSE greater than 50 percent. Most of the tables of estimates in the section titled "Detailed Statistics" include corresponding RSE's that can be calculated using row/column RSE factors that are shaded on each table. Tables 13 and 21 do not have readily identified RSE's. These tables contain median values for which RSE's were unavailable. All comparisons reported in the text were made at the 0.05 level of statistical significance. No adjustments were made for simultaneous inference. Unless otherwise noted, consumption is reported for all fuels in terms of energy (Btu) delivered to the site of use. No adjustment was made for the primary fuels consumed to produce electricity.

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

## Organization of the Report

A detailed discussion of the highlights presented in the Executive Summary follows this section. Tables and figures interspersed throughout the text highlight information of special interest or summarize a finer breakdown given in the "Detailed Statistics" section. Extensive cross-tabulations of housing characteristics, household characteristics, energy consumption and expenditures, and end use appear in the "Detailed Statistics" section, following the main text. The detailed tables in this section are divided into two types, the Consumption and Expenditure Data Tables and the Energy End-Use Tables. The first group of tables display energy consumption and expenditures data that are obtained directly from the RECS. The second group of tables display energy consumption and expenditures for four end uses--space heating, water heating, air conditioning, and appliance usage. These estimates are based on the 1987 RECS and were obtained using a nonlinear regression technique. Appendices A through C contain information on how the survey was conducted, how the end-use estimates were calculated, and on the quality of the data. Procedures for calculating RSE's are located in Appendix C, "Quality of the Data."

The data for the RECS are collected on Forms EIA-457A through G found in Appendix D, "Survey Forms." The Climate Zone and Census Regions and Divisions maps are located in Appendices E and F. A list of related EIA publications is found in Appendix G. Definition of the terms used in this report are located in the "Glossary."

### Change in Annual Consumption Period

The annual period for the RECS consumption data has changed beginning with the 1987 RECS. Consumption data are now collected for the calendar year (January through December of the report year). Previous RECS collected consumption data for the 12-month period of April through March. For example, the 1984 RECS reports contained consumption data for April 1984 through March 1985. The change in the annual consumption period was made to make the RECS consumption estimates more consistent with other EIA data systems that are based on data for a calendar year.

The change to calendar year could increase the potential bias of the estimates of total energy consumption and total energy expenditures because of a change in the midpoint of the consumption period. The change should not affect the estimates of average consumption or average expenditures (See Appendix C, "Quality of the Data").

This change is not anticipated to have a major effect on the quality of the consumption and expenditures estimates. The length of the consumption period remains the same; data collection schedules have been adjusted to collect data for the January through December period. Consumption data stated in this report were collected for the 12-month period beginning in January 1987. (See Appendix C, "Energy Price and Expenditure Data Report 1970-1980 State and U.S. Total," July 1983, DOE/EIA-0376 for a comparison of the two data collection periods based on adjustment of the April through March collection period to the January through December collection period.)

# Energy Consumption Patterns

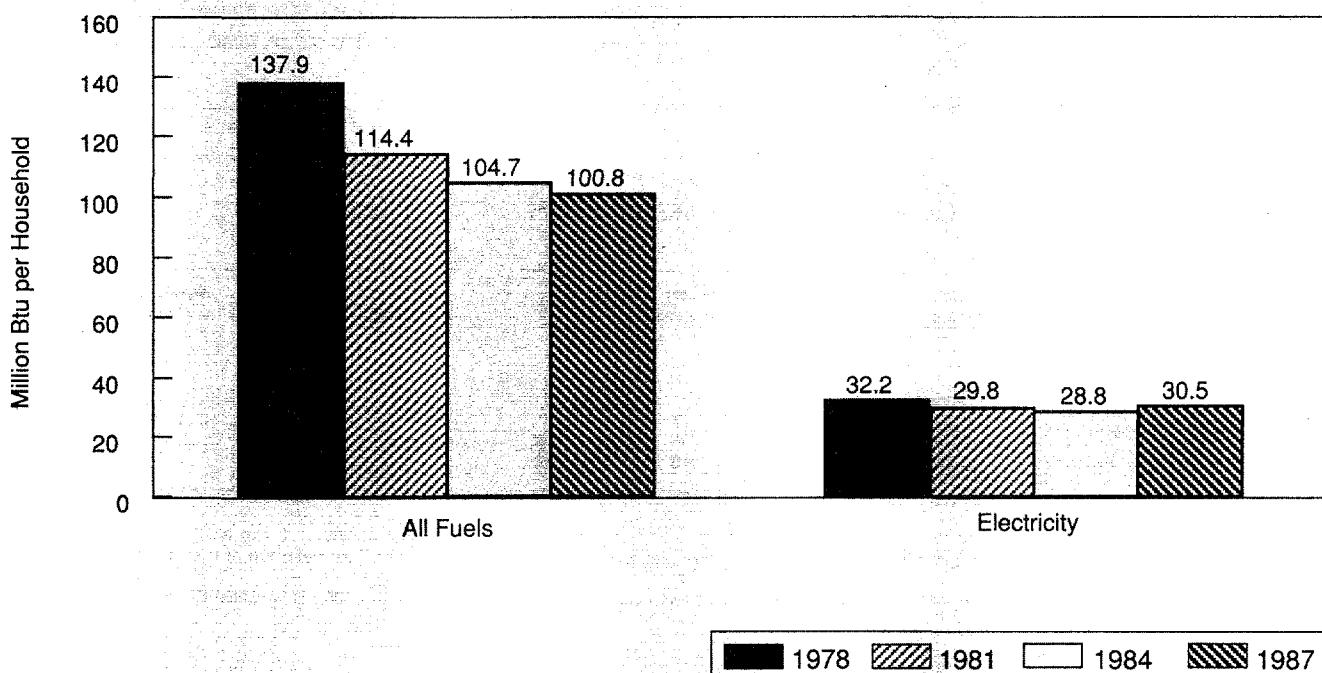
## Electricity Consumption Increased

The average consumption of electricity was greater in 1987 than in 1984. Electricity consumption per household was 30.5 million Btu in 1987 compared to 28.8 million Btu in 1984. This 6 percent increase in average electricity consumption contrasts with the previous

RECS's that have shown a long-term drop in per household electricity consumption. The average overall energy consumption continued the downward trend that has been observed in previous RECS (Figure 1).

Between 1984 and 1987, the household's energy-related behavior changed. Several of the energy-related changes could depress electricity consumption in the household, while at the same time other changes could expand the electricity consumption.

**Figure 1. Consumption per U.S. Household of Major Fuels and of Electricity for 1978, 1981, 1984, and 1987**



Notes: • Electricity component is site electricity. No adjustment was made for the primary fuels consumed to produce the electricity. "See "Glossary" for definition of site energy."

Source: Energy Information Administration, Office of Energy Markets and End Use, 1978, 1981, 1984, and 1987 Residential Energy Consumption Surveys.

Factors tending to increase electricity consumption are:

- In 1987, 64 percent of the households were air conditioned with electricity compared to 60 percent in 1984.
- The summer of 1987 was warmer than 1984. In 1987 the average CDD was 1,368, in 1984 the average CDD was 1,153.<sup>3</sup>
- Among the air-conditioned households, 53 percent had a central air-conditioning system in 1987 compared to 49 percent of the households in 1984.
- Among the air-conditioned households, the percent of households that were operating their air conditioners "all summer" increased from 23 percent in 1984 to 32 percent in 1987.
- More households in 1987 compared to 1984 were using energy-intensive electrical appliances.

Factors tending to decrease electricity consumption are:

- The number of households using microwave ovens increased from 34 percent in 1984 to 61 percent in 1987.
- In 1987, 5 percent of the households were using heat pumps as the main type of heating equipment. In 1984, 4 percent were using them.

## Energy End-Use Patterns

A household uses energy for four major operational purposes (end-uses): space heating, water heating, air conditioning and appliance use. The consumption and expenditure patterns of these end uses help explain the overall per household consumption and expenditures. The end-use estimates in this report are based on the 1987 RECS consumption and expenditure data and were obtained using a nonlinear regression technique. Tables 23 through 32 in the "Detailed Statistics" section contain per household estimates for the four end uses by various energy-related characteristics. (See Appendix B, "End-Use Estimation Methodology" for a discussion of the procedures used to calculate the end-use estimates.)

## Total Energy Consumption

Table 1 provides national estimates for the four end uses by fuel type. A total of 4.94 quadrillion Btu were used in the residential sector for space heating and another 2.10 quadrillion Btu were used for appliances.

**Table 1. U.S. Household Consumption of Major Fuels by End Use, 1987**  
(Quadrillion Btu)

|                         | Space Heating | Water Heating | Air Conditioning | Appliance Usage |
|-------------------------|---------------|---------------|------------------|-----------------|
| Total                   | 4.94          | 1.64          | 0.45             | 2.10            |
| Electricity             | .28           | .31           | .44              | 1.72            |
| Fuel Oil/Kerosene       | 1.05          | .17           | NC               | .00             |
| Liquefied Petroleum Gas | .22           | .06           | NC               | .04             |
| Natural Gas             | 3.38          | 1.10          | .01              | .34             |

NC = No cases in sample.

Notes: • End-use estimates are based on the 1987 RECS and were obtained using a nonlinear regression technique. • The electricity component is site electricity. No adjustment was made for the primary fuels consumed to produce the electricity. See "Glossary" for definition of site energy. • Data may not sum due to rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, the 1987 Residential Energy Consumption Survey.

<sup>3</sup>See Appendix C, "Quality of the Data" for a discussion of the weather data.

## Average Energy Consumption

The per household energy consumption was 100.8 million Btu in 1987. Of this amount, it is estimated that 54 percent of energy used was for space heating, 23 percent for appliances, 18 percent for water heating, and 5 percent for air conditioning.

In 1987 compared to 1984, the per household amount of energy used for space heating and water heating decreased by 8 percent and 4 percent, respectively, while the amount of energy used for air conditioning increased by 19 percent from 4.2 million Btu to 5.0 million Btu. The amount of energy used by electrical appliances increased while the amount of energy used by natural gas appliances decreased (Table 2). Part of the change in the amount of energy used for space heating and appliances can be explained by a change

in the regression procedure that is used to estimate the end-use consumption. The change in methodology accounted for less than 10 percent of the space-heating change and approximately 28 percent of the change in electric appliance consumption (See Appendix B, "End-Use Estimation Methodology" for a discussion of this change).

## Main Heating Fuel

The percent of energy used for each of the four end uses varies by the type of fuel used in the household. Figure 2 shows the average consumption of natural gas, electricity, LPG, and fuel oil and kerosene for each of the four end uses for the households that use natural gas, electricity, LPG and fuel oil, and kerosene.

**Table 2. Changes in U.S. Household Average Energy Consumption by End Use, 1984 and 1987  
(Million Btu per Household)**

|  | 1984  | 1987  | Change in Average Btu | Percent Change |
|--|-------|-------|-----------------------|----------------|
| Total                                    | 104.7 | 100.8 | -3.9                  | -3.7           |
| Space Heating                            | 59.4  | 54.6  | -4.8                  | -8.1           |
| Water Heating                            | 18.8  | 18.1  | -0.7                  | -3.7           |
| Air Conditioning                         | 4.2   | 5.0   | +0.8                  | +19.0          |
| Appliance Usage                          | 22.2  | 23.2  | +1.0                  | +4.5           |
| Electrical Appliance Usage <sup>a</sup>  | 17.7  | 19.0  | +1.3                  | +7.3           |
| Natural Gas Appliance Usage <sup>b</sup> | 6.3   | 5.9   | -0.4                  | -6.3           |

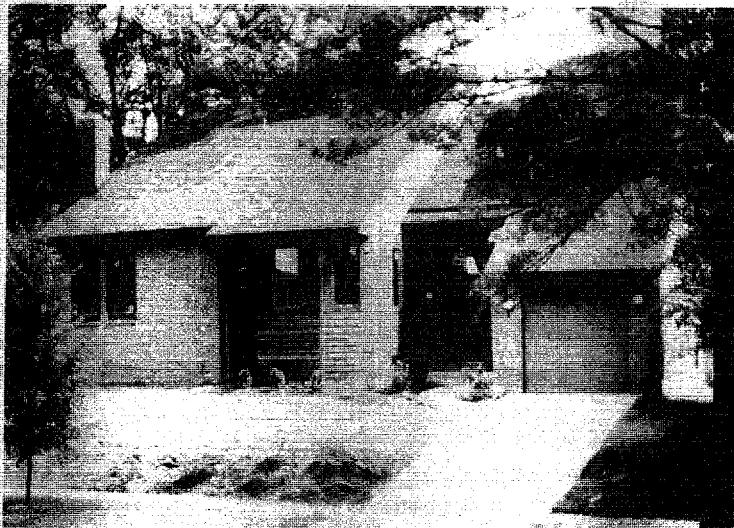
<sup>a</sup> The average electricity consumption for appliances is the average over all households.

<sup>b</sup> The average natural gas consumption for appliances is the average over the set of households that use natural gas.

Notes: • End-use estimates are based on the 1984 and 1987 RECS and were obtained using a nonlinear regression technique. • The electricity component is site electricity. No adjustment was made for the primary fuels consumed to produce the electricity. See "Glossary" for definition of site energy.

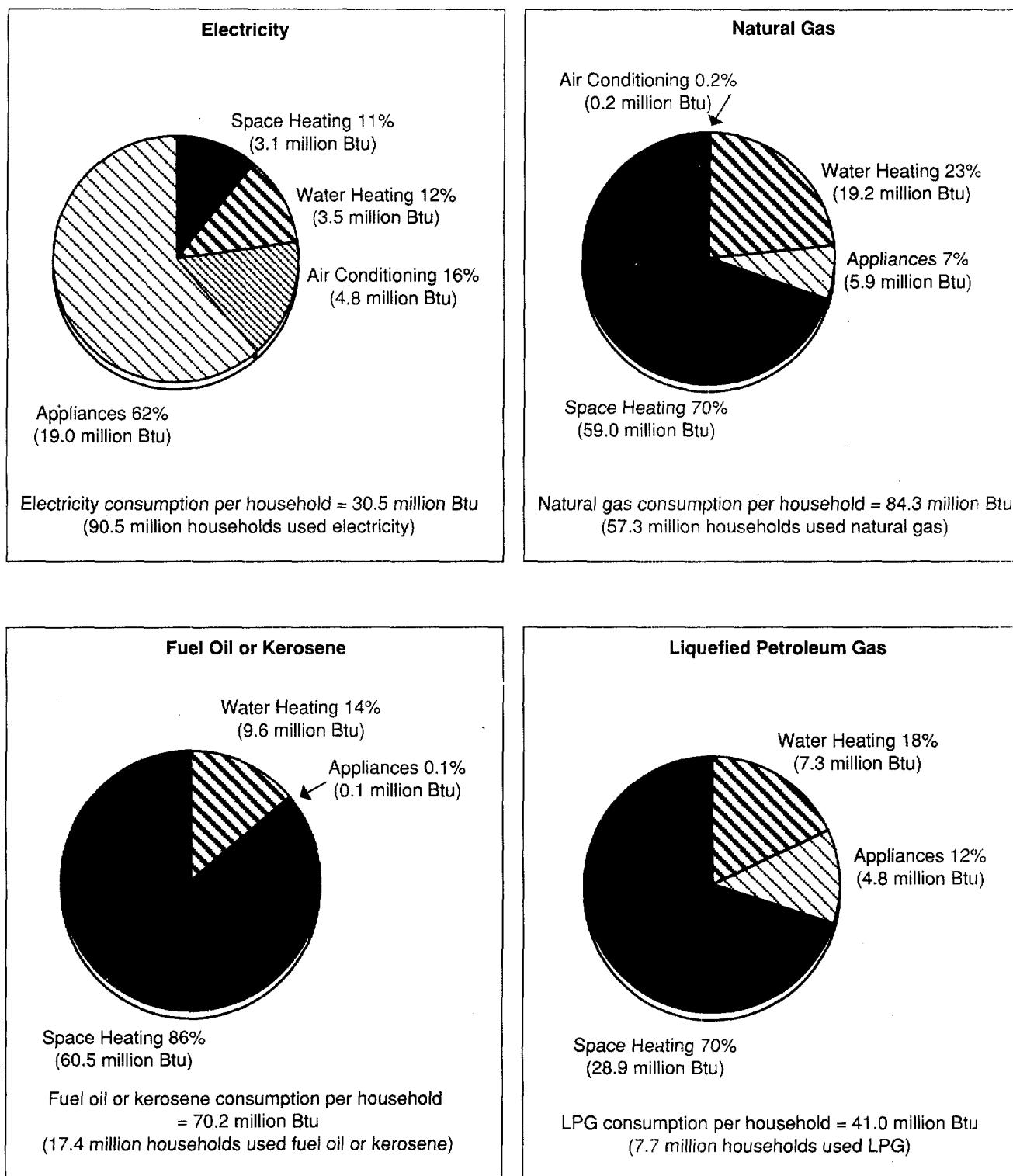
• The average energy consumption for air conditioning is the average over all households. • Data may not sum due to rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, the 1984 and 1987 Residential Energy Consumption Surveys.



*This single-family detached housing unit is an example of some of the housing structures included in the RECS.*

**Figure 2. Consumption of Electricity, Natural Gas, Fuel Oil or Kerosene, and LPG per U.S. Household by End Uses, 1987**



Notes: • End-use estimates are based on the 1987 Residential Energy Consumption Survey and were obtained using a nonlinear regression technique. • The electricity component is site electricity. No adjustment was made for the primary fuels consumed to produce the electricity. See "Glossary" for definition of site energy. • Data may not sum due to rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, 1987 Residential Energy Consumption Survey.

# 1987 Household Electricity Consumption Greater than 1984

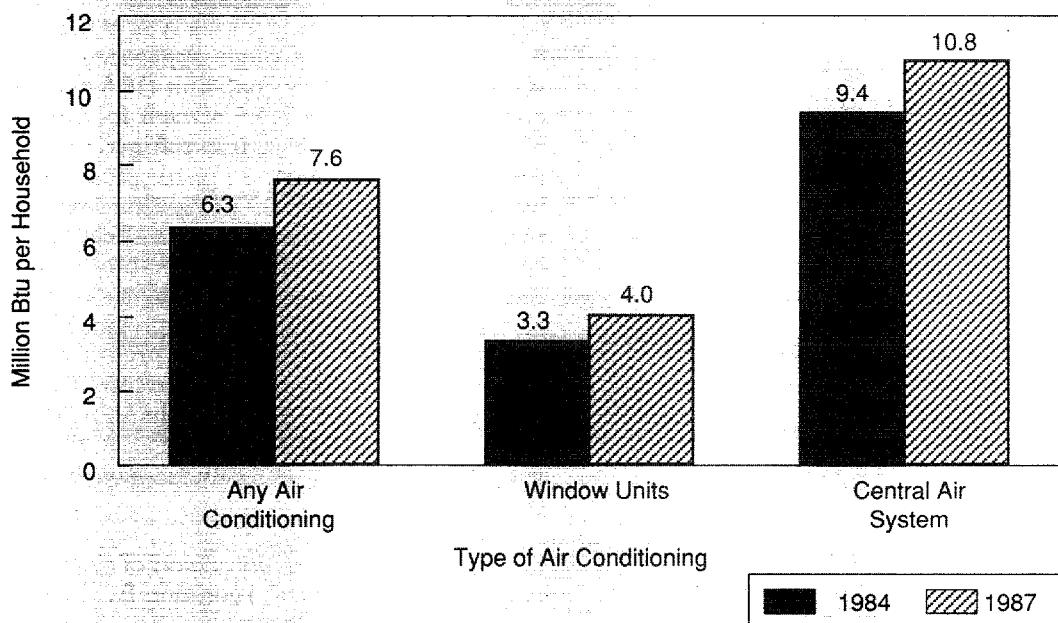
The increase in average electricity consumption per household between 1984 and 1987 was due primarily to an increase in the amount of electricity that was used by air conditioners and other appliances.

## Air Conditioners

Among the 57.1 million households that used electric air conditioning in 1987, 21.7 percent of these households' total electricity consumption was used for air conditioning. The per household electricity consumption attributed to air conditioners was 7.6 million Btu, 20.6 percent more than was consumed in 1984. In 1987, households that cooled with central air used 6.8 million more Btu than households that cooled with window units (Figure 3).

Twice as much electricity was used during the summer for air conditioning among households operating their air conditioners (central air-conditioning systems or wall units) "all summer" compared to households operating their air conditioners "quite a bit".

**Figure 3. Electricity Consumption per U.S. Household for Air Conditioning by Type of Air Conditioning, 1984 and 1987**



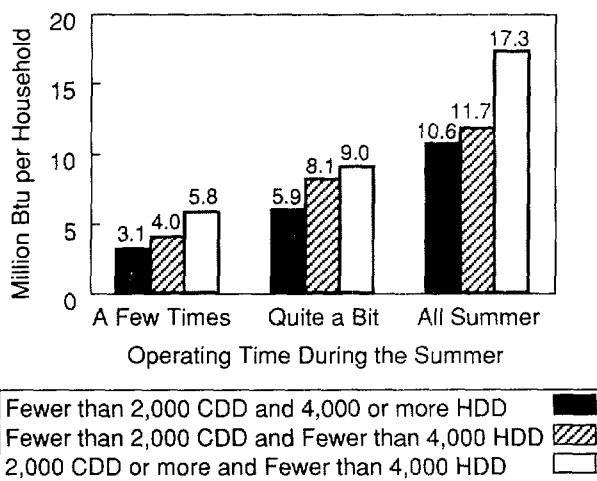
Notes: • End-use estimates are based on the 1987 Residential Energy Consumption Survey and were obtained using a nonlinear regression technique. • The electricity component is site electricity. No adjustment was made for the primary fuels consumed to produce the electricity. See "Glossary" for definition of site energy. • Data may not sum due to rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, 1984 and 1987 Residential Energy Consumption Surveys.

The RECS collects information about the length of time households operated their air conditioners during the summer months. In 1987, 32.4 percent of households reported operating their air conditioners "all summer" as opposed to "quite a bit" or "only a few times" during the summer.

The amount of electricity used by air conditioners is related to both the weather and how often the air conditioner is operated by the household. In the 1987 RECS, differences in both the number of CDDs and in household behavior relating to use of the air conditioner played a part in the amount of electricity used for air conditioning. Households living in the coldest three climate zones that operated their air conditioners only a few times consumed an average of 3.1 million Btu of electricity while households that operated their air conditioners all summer in the same climate zones consumed an average of 10.6 million Btu. Households that lived in the warmest two climate zones and operated their air conditioners only a few times consumed an average of 5.8 million Btu while all summer users consumed an average of 17.3 million Btu (Figure 4).

**Figure 4. Electricity Consumption per U.S. Household for Air Conditioning by Operating Time and Climate Zones, 1987**



Notes: • End-use estimates are based on the 1987 Residential Energy Consumption Survey and were obtained using a nonlinear regression technique. • The electricity component is site electricity. No adjustment was made for the primary fuels consumed to produce the electricity. See "Glossary" for definition of site energy. • Data may not sum due to rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, 1987 Residential Energy Consumption Survey.

## Appliances

The RECS collects data on the presence of major household energy-using appliances. For some of these appliances, the number found in the home is included. In 1987, the per household amount of electricity used by appliances was 19.0 million Btu, 1.3 million Btu more than was used in 1984. Respondents living in single-family housing units used twice as much electricity for appliances than respondents living in buildings of two or more housing units (22.3 million Btu, 11.5 million Btu, respectively). Households with incomes of \$35,000 or more used 83.7 percent more electricity for appliances than households with incomes of less than \$10,000 (Figure 5).

### Refrigerators Use One-Fifth of Household Electricity

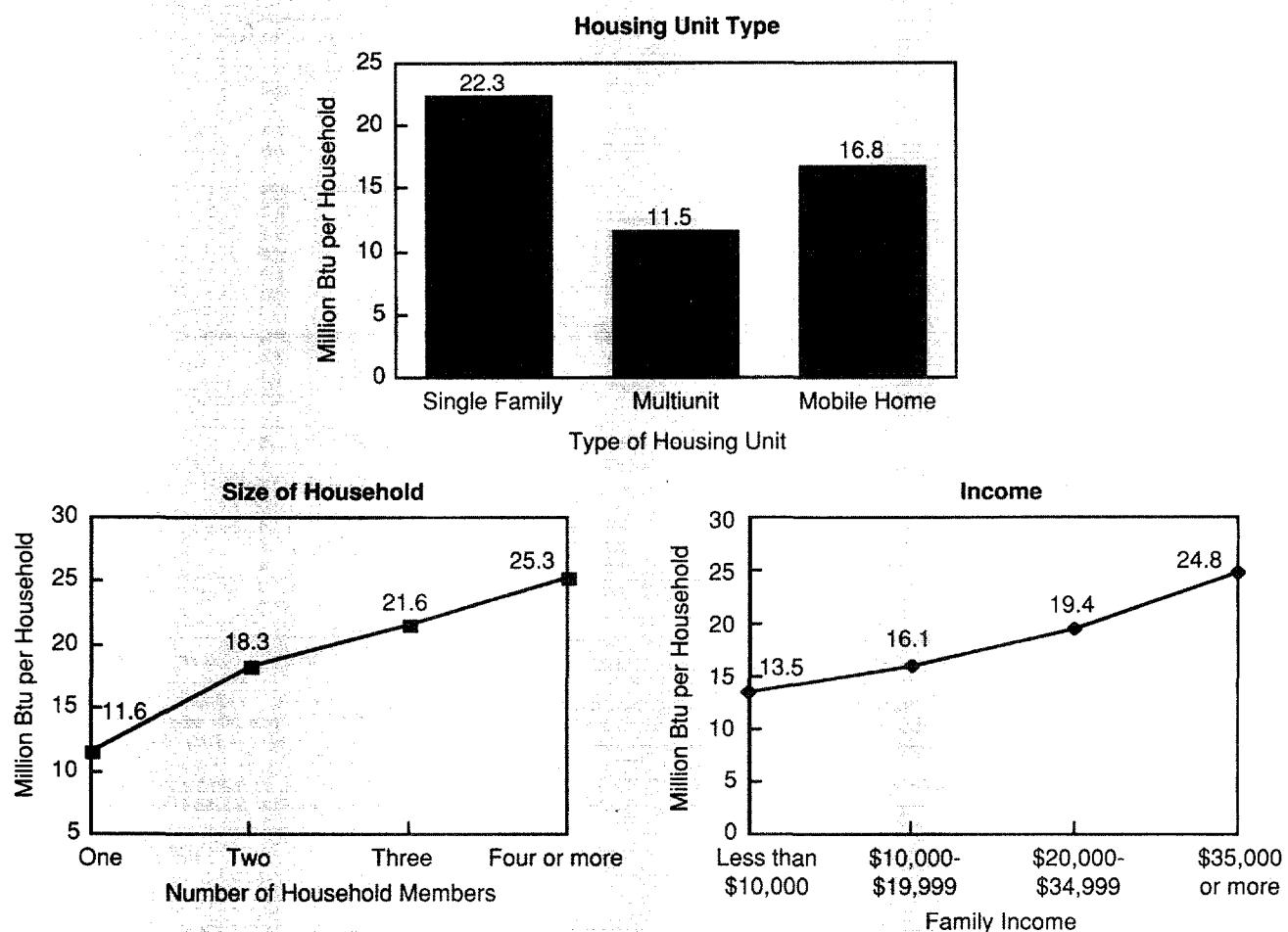
Household appliances that use electricity can be divided into two tiers depending on the amount of electricity that is consumed by each type of appliance. The first tier consists of a single appliance--refrigerators. Refrigerators use about one-fifth (19.8 percent) of all household electricity (14.5 percent for frost free and 5.3 percent for nonfrost free refrigerators). Of total electricity consumption, a greater proportion is used by refrigerators than the proportion used for either space heating (10.2 percent), water heating (11.5 percent), or air conditioning (15.7 percent) even though these end uses are more energy intensive than refrigerators. The greater use in the aggregate of electricity by refrigerators is a result of the prevalence of refrigerators. Almost every home uses electricity to operate a refrigerator (with 14 percent of the households having more than one refrigerator) while not all households use electricity for space heating, water heating or air conditioning.

Along with these major consumers of electricity, a second tier of appliances each consume from 1 to 6 percent of total electricity. This second tier of electric appliances includes clothes dryers (5.6 percent), color television sets (5.2 percent), freezers--manual or automatic (5.1 percent), range and oven (3.8 percent), and water-bed heaters (2.5 percent). Since the number of homes with water beds has been increasing rapidly (50 percent increase from 1984 to 1987<sup>4</sup>), the ranking for water-bed heaters may change in the near future.

Electrical appliances have been ranked by total energy consumption using data from several sources (Table 3). The number of appliances in the United States is

<sup>4</sup>See *Housing Characteristics 1987* DOE/EIA-0314(87), May 1989, p. 8 for a discussion of the increase in electrical appliance usage in the household.

**Figure 5. Electricity Consumption per U.S. Household for Appliance Usage by Selected Household Characteristics, 1987**



Notes: • End-use estimates are based on the 1987 Residential Energy Consumption Survey and were obtained using a nonlinear regression technique. • The electricity component is site electricity. No adjustment was made for the primary fuels consumed to produce the electricity. See "Glossary" for definition of site energy. • Data may not sum due to rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, 1987 Residential Energy Consumption Survey.

from the 1987 RECS and the annual consumption per appliance is from the Edison Electric Institute (EEI) and metered data published in *Energy Auditor & Retrofitter* (Nov/Dec 1987). The consumption data from the EEI are from a series of end-use submetering experiments conducted by various utilities scattered around the United States.<sup>5</sup> (For RECS estimates of consumption for space heating, water heating or air

conditioning see the tables in "Detailed Statistics" in this report.)

Although the amount of error in both the estimates of appliance consumption and the percent of total electricity consumption are unknown in Table 3, the estimates still provide a broad ranking of the consumption of electric appliances based on both the prevalence of the appliance and on the average consumption of the appliance.

<sup>5</sup>The results of a comparison by the EEUD of some of these submetering estimates with the RECS estimates will be discussed in a report to be released in the future.

**Table 3. U.S. End-Use Consumption of Electricity for Selected Appliances, 1987**

| Appliances           | Million Units | Annual kWh | Total Electric Appliance Consumption |                | Percent of Total Electric Appliance Consumption | Percent of Total Electricity Consumption |
|----------------------|---------------|------------|--------------------------------------|----------------|---|--|
|                      |               |            | (billion kWh)                        | (trillion Btu) |   |  |
| Total                | NA            | NA         | 504.0                                | 1,719.6        | 100.0   | 62.4                                     |
| Frost-free           |               |            |                                      |                |   |  |
| Refrigerator*        | 73.7          | 1,591      | 117.3                                | 400.1          | 23.3  | 14.5                                     |
| Clothes Dryer        | 45.9          | 993        | 45.6                                 | 155.6          | 9.0   | 5.6                                      |
| Non Frost-Free       |               |            |                                      |                |   |  |
| Refrigerator*        | 28.5          | 1,500      | 42.8                                 | 145.9          | 8.5   | 5.3                                      |
| Color TV*            | 131.5         | 320        | 42.1                                 | 143.6          | 8.4   | 5.2                                      |
| Range/Oven           | 51.4          | 596        | 30.7                                 | 104.6          | 6.1   | 3.8                                      |
| Furnace Fan          | 46.8          | 650        | 30.4                                 | 103.8          | 6.0   | 3.8                                      |
| Manual Freezer       | 20.8          | 1,050      | 21.8                                 | 74.5           | 4.3   | 2.7                                      |
| Water-bed Heater     | 12.5          | 1,600      | 20.0                                 | 68.2           | 4.0   | 2.5                                      |
| Frost-free           |               |            |                                      |                |   |  |
| Freezer              | 10.6          | 1,820      | 19.3                                 | 65.8           | 3.8   | 2.4                                      |
| Ceiling Fan          | 41.8          | 170        | 7.1                                  | 24.2           | 1.4   | .9                                       |
| Clothes Washer       | 66.4          | 103        | 6.8                                  | 23.3           | 1.4   | .8                                       |
| Dishwasher           | 39.0          | 165        | 6.4                                  | 22.0           | 1.3   | .8                                       |
| Microwave Oven*      | 55.0          | 100        | 5.5                                  | 18.8           | 1.1   | .7                                       |
| Blanket              | 27.2          | 147        | 4.0                                  | 13.6           | .8  | .5                                       |
| Black/White TV*      | 39.4          | 100        | 3.9                                  | 13.4           | .8  | .5                                       |
| Dehumidifier         | 9.0           | 377        | 3.4                                  | 11.6           | .7  | .4                                       |
| Well Pump            | 4.7           | 500        | 2.4                                  | 8.0            | .5  | .3                                       |
| Humidifier           | 13.2          | 163        | 2.2                                  | 7.3            | .4  | .3                                       |
| Swimming Pool Pump   | 2.0           | 1,000      | 2.0                                  | 6.8            | .4  | .2                                       |
| Swimming Pool Heater | .6            | 3,000      | 1.8                                  | 6.1            | .4  | .2                                       |
| Whole-house Fan      | 8.6           | 200        | 1.7                                  | 1.9            | .3  | .2                                       |
| Residual             | NA            | NA         | 86.8                                 | 296.2          | 17.2  | 10.7                                     |

\* Counts of individual appliances within the household. Other units are counts of households that may have one or more indicated appliances.

NA = Data not available.

Notes: • Electricity consumption for central and room air conditioning, space heating, water heating, and portable heaters is excluded. • Total electricity consumption in the 1987 RECS was 808 billion kWh. • Total electricity consumption for appliances in the 1987 RECS was 504 billion kWh. • "Residual" includes appliances not listed such as lighting, small cooking appliances, computers, and electric tools. It also includes the error term in estimating the energy consumption of the listed appliances. See "Glossary" for definition of Btu conversion.

Sources: • Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, the 1987 Residential Energy Consumption Survey. • Edison Electric Institute, Washington, DC. • Maier, Alan, "Saving the 'Other' Energy in Homes," **Energy Auditor & Retrofitter**, (Nov/Dec 1987).

## Space Heating

The average amount of energy a household used for heating a home in 1987 was 54.6 million Btu. Among natural gas heated homes, 66.9 million Btu of natural gas was used for space heating and among electrical heated homes 14.5 million Btu of (site) electricity was used.

Electricity consumption is the measured electricity that is consumed at the site (the housing unit). This measurement does not account for the amount of energy that is required to generate the electricity. To account approximately for energy used for generation, the site value of electricity is multiplied by a factor of three.

The amount of both natural gas and electricity that was used for space heating decreased from 1984 to 1987. In natural gas-heated homes, the amount of natural gas that was used for space heating decreased by approximately 7.9 percent from 72.6 million Btu in

1984 to 66.9 million Btu in 1987. The amount of electricity used for heating decreased by 12.7 percent among households that used it as the main source of heat (16.6 million Btu in 1984 to 14.5 million Btu in 1987). Only about one-sixth of this decrease was due to a change in the methodology used to estimate electric space heating.

The weather and the household energy related behavior, reflected by the level of indoor thermostat settings, are two factors that influence the amount of energy that is consumed in the household. In the 1987 RECS weather played a large part in the decrease in space heating consumption. In 1987, the weather was 8 percent warmer (4,203 HDD) than the normal average, while in 1984, the weather was 2 percent colder than the normal average. Previous analysis of the 1987 RECS indicated that households were maintaining higher indoor temperatures in 1987 than in 1984 (*Housing Characteristics 1987*, DOE/EIA-0314(87)). This behavior would normally result in increased consumption. Since consumption decreased it appeared that weather in 1987 had a greater influence than behavior.

## Space-Heating Intensity

A method of adjusting the amount of energy consumed for space heating for the effects of both the weather and size of a residence is to compute a ratio of the space-heating consumption to HDD and to floorspace. (See the Heating and Cooling Intensities box in this section.) This ratio provides a measure of the heating intensity.

In 1987, the average household's heating intensity was 8.7 Btu per HDD and per square foot. Heating intensities varied by type of main heating fuel, and the type and age of the residence. Heating intensities ranged from 3.4 Btu per HDD and per square foot for electrically heated homes to 10.0 Btu per HDD and per square foot for natural gas-heated homes. When site electricity was adjusted, the heating intensity for electrically heated homes increased from 3.4 Btu per HDD and per square foot to 10.2 Btu per HDD and per square foot, making electricity consumption comparable to fossil fuels.

**Type of Housing Unit:** Heating intensities in single-family units and multiunit structures differed by the type of primary heating fuel. When the main heat was a fossil fuel, single-family housing units had lower heat-

ing intensities than multifamily housing units. When electricity was the main source of heating energy, the average amount of electricity used for space heating did not differ at a statistically significant level between single and multiunit structures, after adjusting for the weather and the size of the housing unit (Table 4).

**Age of Housing Unit:** The heating efficiency of newer homes can be addressed by looking at the average heating intensity by the age of the housing structure. In newer homes (housing units constructed in 1980 or after), the average heating intensities of all main space heating fuels were significantly lower than in homes constructed in the 1950's and 1960's.

Single-family housing units that were heated with natural gas showed a consistent decrease in space-heating consumption by the age of the housing unit beginning with 10.7 Btu per HDD and per square foot for homes built before 1950 and decreasing to 7.0 Btu per HDD and per square foot for homes built in 1980 or after. Electrically heated homes constructed in 1980 and after used one-third less site electricity per HDD and per square foot for space heating than homes constructed in the 1950's and 1960's. Homes constructed between 1950 and 1969 consumed 3.9 Btu per HDD and per square foot. Homes constructed in 1980 and after consumed 2.6 Btu per HDD and per square foot (Figure 6).

**Table 4. U.S. Heating Intensities by Type of Housing Structures and Main Heating Fuel, 1987**  
(Btu per HDD and per Square Foot)

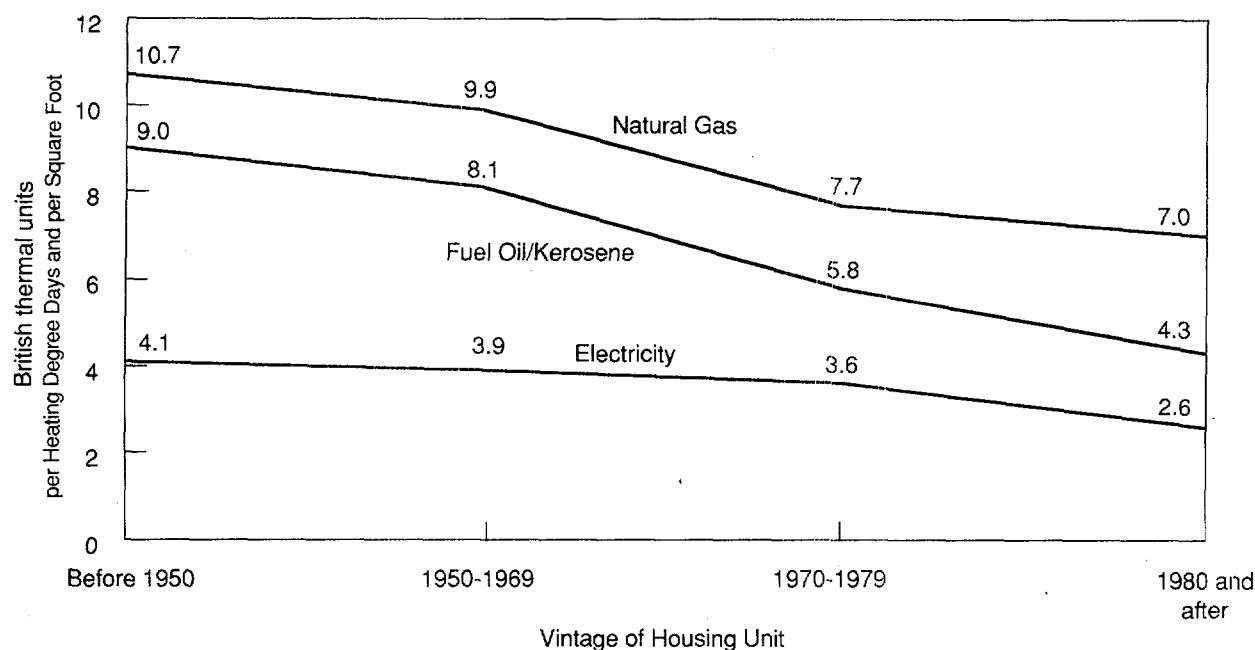
| Type of Main Heating Fuel | Type of Structure |           |             |
|---------------------------|-------------------|-----------|-------------|
|                           | Single Family     | Multiunit | Mobile Home |
| All Fuels                 | 8.2               | 10.9      | 10.9        |
| Electricity (Site)        | 3.4               | 3.1       | 5.6         |
| Natural Gas               | 9.6               | 12.3      | 13.3        |
| Fuel Oil/Kerosene         | 8.1               | 13.2      | 13.8        |
| Liquefied Petroleum Gas   | 8.9               | NC        | 11.9        |

NC = No cases in sample.

Notes: • End-use estimates are based on the 1987 RECS and were obtained using a nonlinear regression technique. • The electricity component is site electricity. No adjustment was made for the primary fuels consumed to produce the electricity. See "Glossary" for definition of site energy. • Data may not sum due to rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, the 1987 Residential Energy Consumption Survey.

**Figure 6. U.S. Heating Intensity for Single-Family Homes by Vintage of Housing Unit and Main Heating Fuel, 1987**



Notes: • End-use estimates are based on the 1987 Residential Energy Consumption Survey and were obtained using a nonlinear regression technique. • The electricity component is site electricity. No adjustment was made for the primary fuels consumed to produce the electricity. See "Glossary" for definition of site energy. • See Appendix C, "Quality of the Data" for a discussion of heating intensity. • Data may not sum due to rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, 1987 Residential Energy Consumption Survey.

### Heating and Cooling Intensities

A conventional method of adjusting or controlling for the effects of the weather and the size of a residence on consumption is to present consumption in terms of Btu per heating degree-day or cooling degree-day and per square foot of the housing unit. These values then provide a measurement of the heating or cooling intensity of that housing unit.

The procedure used to calculate the estimates of the heating intensity for a category of households in the 1987 RECS is:

$$\text{Heating Intensity} = \frac{\text{BTU}}{\text{HDD} \times \text{Sq.Ft.}}$$

Where:

Btu is the average consumption in Btu for space heating for all households in the category,

HDD is the average heating degree-days experienced by all households in the category, and

Sq.Ft. is the average heated square footage of the housing unit for all households in the category.

See Appendix C, "Quality of the Data" for a discussion of an alternative method that was used to calculate the estimates of the Btu per heating degree-day and per square foot that were presented in the RECS: Consumption and Expenditures March 1984 through April 1985 Part 2: Regional Data.

# Energy Expenditure Patterns

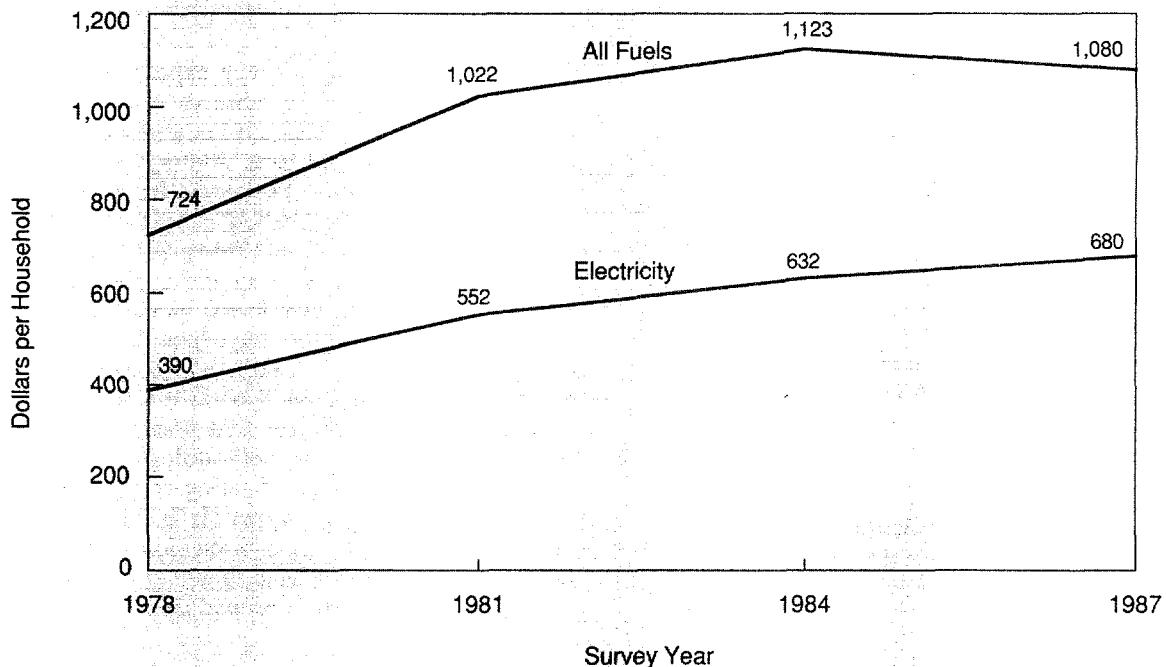
## Household Average Energy Expenditures were Less

The household's average energy expenditures were \$43 less in 1987 than in 1984. This marked the first time that a RECS showed a drop in the household's average energy expenditures from the previous RECS. Lower per household energy expenditures reflected in the 1987 RECS were due to a decrease in energy consumption coupled with relatively unchanging overall energy

prices between the 1984 RECS and the 1987 RECS. (Fossil fuel prices declined but electricity prices remained essentially unchanged.)

There was not a decline in expenditures, however, for all types of energy. Electricity expenditures continued to climb while fossil fuel expenditures declined (Figure 7). Energy expenditures are tied directly to both the price of energy and the level of energy consumption. Therefore, even though electricity prices were stable, average electricity expenditures increased, since households were using more electricity in 1987 than in 1984.

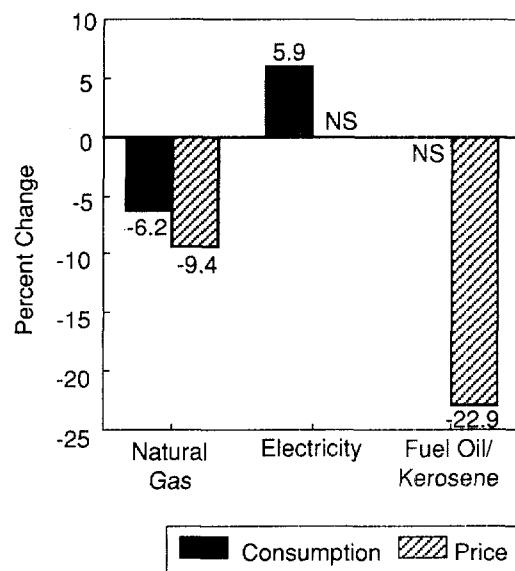
**Figure 7. Expenditures per U.S. Household for All Fuels and for Electricity for 1978, 1981, 1984 and 1987**



Source: Energy Information Administration, Office of Energy Markets and End Use, 1978, 1981, 1984, and 1987 Residential Energy Consumption Surveys.

**Change in Energy Prices:** The change in the price of energy did not appear to influence the total residential energy consumption as expected. While fossil-fuel prices declined from 1984 to 1987, the consumption of these fuels also declined. Conversely, households consumed more electricity in 1987 even though there was no statistically significant change in electricity prices from 1984 to 1987 (Figure 8). A mild winter in 1987 and newer homes that were more energy efficient may have had a stronger effect on consumption than the decline in fossil-fuel prices.

**Figure 8. Percent Change in U.S. Household Average Energy Consumption and Price, 1984 and 1987**



NS= Not statistically significant at the 0.05 level.

Note: • Electricity component is site electricity. No adjustment was made for the primary fuels consumed to produce the electricity. See "Glossary" for definition of site energy.

Source: Energy Information Administration, Office of Energy Markets and End Use, 1984 and 1987 Residential Energy Consumption Surveys.

**Energy Prices and End-Use Consumption:** The price of electricity influenced how a household used electricity. For example, the proportion of households that used

electricity as the main cooking fuel declined from 81 percent of the households to 29 percent when the standard price of electricity increased from less than 5 cents per kilowatthour (kWh) to 10 cents or more per kWh (Table 5). The standard price of electricity is the potential monthly cost of electricity to the household if they consumed 1,000 kWh each month. A standard electricity price was assigned to each RECS household. (See Appendix A, "How the Survey Was Conducted" for a discussion of the standard price of electricity.)

## Greater Proportion of Energy Expenditures Used for Appliances

Household appliance usage constituted the largest share of average energy expenditures with 43 percent of the households energy bill spent for operating appliances. Space heating followed with 32 percent (Figure 9).

## Air-Conditioning Expenditures Increased by 25 Percent

The decrease in overall energy expenditures and the increase in electricity expenditures were reflected in the changes in energy expenditure patterns from 1984 to 1987 for specific end uses. Average space-heating expenditures declined by 18 percent from \$427 in 1984 to \$350 in 1987. Water-heating expenditures declined by 10 percent from \$171 in 1984 to \$154 in 1987. Expenditures for air conditioning and appliances, which are both heavy electricity users, increased. Between 1984 and 1987, air-conditioning expenditures increased by 25 percent (\$87 in 1984, \$109 in 1987) and appliances by 7 percent (\$438 in 1984, \$467 in 1987). The amount of decrease in expenditures that was attributed to a change in the estimation methodology was approximately 10 percent for space heating and 28 percent for electric appliances. (See Appendix B, "End-Use Estimation Methodology" for a discussion of the change in energy used for space heating and appliances due to a change in the estimation procedure.)

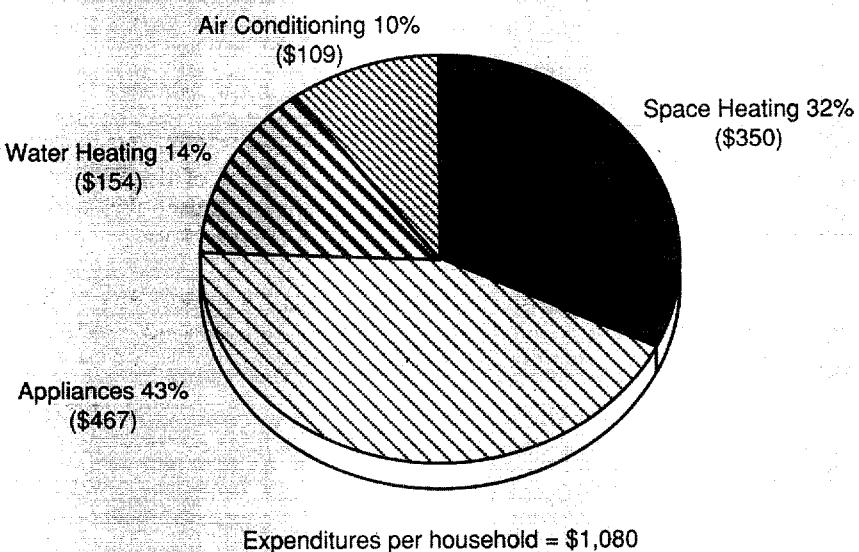
**Table 5. Percent of U.S. Households with Electric Appliances by Standard Price of Electricity, 1987**

| Number of Households (million)        | Percent of Households Using Electricity for |                         |                  |      |                   |               |            |         |      |
|---------------------------------------|---|-------------------------|------------------|------|-------------------|---------------|------------|---------|------|
|                                       | Main Space Heating Fuel                     | Main Water Heating Fuel | Air Conditioning |      | Appliances        |               |            |         |      |
|                                       |   |                         | Central          | Room | Main Cooking Fuel | Clothes Dryer | Dishwasher | Freezer |      |
| <b>United States</b>                  | 90.5  | 19.8                    | 35.3             | 33.2 | 30.8              | 58.1          | 50.7       | 43.1    | 34.0 |
| <b>Standard Price (cents per kWh)</b> |   |                         |                  |      |                   |               |            |         |      |
| Less than 5                           | 4.5   | 39.2                    | 65.0             | 19.7 | 16.0              | 80.6          | 73.0       | 59.6    | 48.3 |
| 5 to 5.99                             | 8.5   | 25.7                    | 50.0             | 43.6 | 30.9              | 68.2          | 62.0       | 40.4    | 40.5 |
| 6 to 6.99                             | 23.9  | 15.8                    | 37.8             | 37.5 | 30.4              | 61.8          | 56.6       | 42.7    | 41.4 |
| 7 to 7.99                             | 21.0  | 27.8                    | 43.1             | 40.7 | 29.6              | 62.6          | 51.1       | 42.3    | 30.5 |
| 8 to 8.99                             | 15.3  | 18.0                    | 26.3             | 28.0 | 28.7              | 54.5          | 44.5       | 47.1    | 28.8 |
| 9 to 9.99                             | 11.7  | 10.1                    | 18.0             | 25.5 | 36.6              | 44.6          | 42.1       | 40.1    | 29.1 |
| 10 or More                            | 5.6   | 8.1                     | 10.0             | 13.3 | 42.2              | 29.4          | 24.4       | 33.6    | 17.9 |

Note: Data may not sum due to rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, the 1987 Residential Energy Consumption Survey.

**Figure 9. Expenditures per U.S. Household by End Uses, 1987**



Notes: • End-use estimates are based on the 1987 Residential Energy Consumption Survey and were obtained using a nonlinear regression technique. • Data may not sum due to rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, 1987 Residential Energy Consumption Survey.

## **What was a Typical Energy Budget in 1987?**

A typical energy budget was calculated for two types of housing units. Housing unit Type A was a single family house that: used only natural gas for space heating, water heating and main cooking; used only natural gas or electricity for appliances; and used only electricity for air conditioning. Housing unit Type B was an all-electric apartment that used only electricity for space heating, water heating, main cooking, air conditioning, and appliances.

Households living in single-family detached housing units that primarily used natural gas (Type A), spent an average of \$1,172 for their total energy use in 1988. Energy expenditures for households living in an all-electric apartment (Type B) spent an average of \$736.

These total expenditures varied by whether the household used air conditioning or not. The households living in an air-conditioned Type A house spent an average of \$1,282 for energy. Of this total, \$573 was spent for natural gas and \$709 was spent for electricity. Approximately 28 percent of the \$709 spent for electricity was used for air conditioning. The average expenditures for Type A households without air conditioning were almost \$300 less than the households with air conditioning (Figure 10).

Households living in a Type B all-electric apartment with air conditioning spent an average of \$794 for energy. Approximately one-fifth of this total amount was used for air conditioning. Average energy expenditures for households living in all-electric apartments without air conditioning were \$579 (Figure 10).

Figure 10 also lists the average HDD and CDD for the households, since a portion of the difference in energy expenditures between households that use air conditioning and those that do not use it can be explained by the weather. Also included in the figure is the average heated square feet for each type of household.

**Figure 10. Energy Expenditures by End Uses for Two Typical Housing Units, 1987**

**Type A**  
Natural Gas Single-Family Detached<sup>a</sup>

|   |       | With Air Conditioning | Without Air Conditioning |       |
|---|-------|-----------------------|--------------------------|-------|
|   |       | Percent               | Percent                  |       |
| Total   | 1,282 | 100                   | 985                      | 100   |
| Natural Gas   | 573   | 45                    | 539                      | 55    |
| Space Heating   | 387   | 30                    | 361                      | 37    |
| Water Heating   | 129   | 10                    | 129                      | 13    |
| Appliances  | 57    | 4                     | 49                       | 5     |
| Electricity   | 709   | 55                    | 446                      | 45    |
| Air Conditioning                                      | 199   | 16                    | --                       | --    |
| Appliances  | 510   | 38                    | 446                      | 45    |
| <b>Housing Size and Climate (average)<sup>c</sup></b> |       |                       |                          |       |
| Heated Square feet                                    |       | 1,931                 |                          | 1,523 |
| Heating Degree-Days                                   |       | 4,037                 |                          | 4,153 |
| Cooling Degree-Days                                   |       | 1,542                 |                          | 1,176 |

**Type B**  
All-Electric Apartment<sup>b</sup>

|   |     | With Air Conditioning | Without Air Conditioning |       |
|---|-----|-----------------------|--------------------------|-------|
|   |     | Percent               | Percent                  |       |
| Total   | 794 | 100                   | 579                      | 100   |
| Space Heating   | 166 | 21                    | 230                      | 40    |
| Water Heating   | 156 | 20                    | 129                      | 22    |
| Air Conditioning                                      | 166 | 21                    | --                       | --    |
| Appliances  | 307 | 39                    | 221                      | 38    |
| <b>Housing Size and Climate (average)<sup>c</sup></b> |     |                       |                          |       |
| Heated Square feet                                    |     | 871                   |                          | 789   |
| Heating Degree-Days                                   |     | 2,905                 |                          | 4,666 |
| Cooling Degree-Days                                   |     | 2,136                 |                          | 624   |

-- Not Applicable.

<sup>a</sup> Type A home: Single-family detached housing unit, with natural gas used for space heating, water heating and main cooking; natural gas and electricity used for appliances, and electricity used for air conditioning.

<sup>b</sup> Type B home: All-electric apartment with electricity used for space heating, water heating, cooking air conditioning and appliances.

<sup>c</sup> Averages are national averages over all RECS households. HDD's and CDD's differ by building type because apartments heated by electricity are more heavily weighted toward warmer regions.

Notes: • End-use estimates are based on the 1987 RECS and were obtained using a nonlinear regression technique. • Data may not sum due to rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, 1987 Residential Energy Consumption Survey.



# Energy Use And The Elderly

## Elderly Use More Space-Heating Energy

One type of demographic information collected by the RECS is the age of the household members. For the following discussion, the elderly are defined as 60 years or older, based on the age of the householder. The elderly constitute an increasing proportion of the U.S. population and their energy demands differ from the nonelderly. In the 1987 RECS, 28 percent of the households had a householder age 60 years or older.

**Consumption and Expenditure Patterns 1987:** There was no statistically significant difference between the elderly and the nonelderly in the overall per household amount of energy they consumed. However, there were differences between the two groups in the way they used energy. The elderly used approximately 10 percent more energy to heat their homes even after adjusting for the weather and size of the housing unit. They used less energy for water heating, air conditioning, and appliance usage than the nonelderly.

While there was no difference in the overall consumption between the two groups, there was a statistically significant difference between the elderly and nonelderly in the amount of money spent for energy. The elderly spent \$98 less per household for energy. They spent less for all end uses except one--space heating. The elderly spent an average of \$49 (13 percent) more for home heating than did the nonelderly (Table 6). Higher space-heating consumption and expenditures among the elderly may be related to the following factors: 1) a greater proportion of the elderly live in older homes that may be less energy efficient and 2) in 1987, a greater proportion of the elderly kept their thermostats at a higher level than the nonelderly households.

In 1987, approximately 61 percent of the elderly's household energy consumption was used for space heating (nationally, 54 percent of energy was used for space heating and among the nonelderly, 51 percent was used.) The proportions of energy used by the

**Table 6. Difference in U.S. Energy Consumption and Expenditure Patterns Between Elderly and Nonelderly by End Use, 1987**

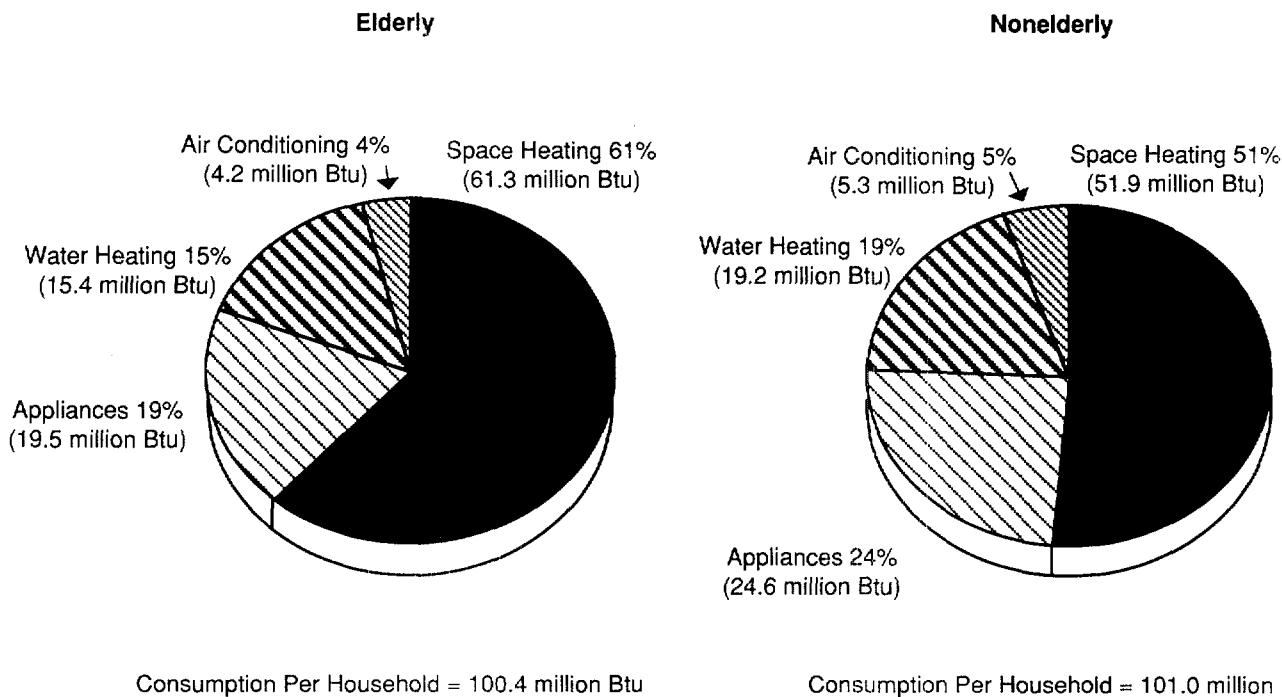
|                                  | Age of Householder |                    | Absolute Difference | Percent Difference (percent) |
|----------------------------------|--------------------|--------------------|---------------------|------------------------------|
|                                  | 60 Years or Older  | Less than 60 Years |                     |                              |
| <b>Consumption (million Btu)</b> |                    |                    |                     |                              |
| Space Heating                    | 100.4              | 101.0              | NS                  | NS                           |
| Water Heating                    | 61.3               | 51.9               | +9.4                | +15                          |
| Air Conditioning                 | 15.4               | 19.2               | -3.8                | -25                          |
| Appliance Usage                  | 4.2                | 5.3                | -1.1                | -26                          |
| Space Heating/HDD* Sq.Ft. (Btu)  | 19.5               | 24.6               | -5.1                | -26                          |
| Space Heating/HDD* Sq.Ft. (Btu)  | 9.4                | 8.4                | +1                  | +10                          |
| <b>Expenditures (dollars)</b>    |                    |                    |                     |                              |
| Space Heating                    | 1,010              | 1,108              | -98                 | -10                          |
| Water Heating                    | 385                | 336                | +49                 | +13                          |
| Air Conditioning                 | 131                | 163                | -32                 | -24                          |
| Appliance Usage                  | 93                 | 115                | -22                 | -24                          |
|                                  | 401                | 494                | -93                 | -23                          |

NS = Not statistically significant at the 0.05 level.

Notes: • End-use estimates are based on the 1987 RECS and were obtained using a nonlinear regression technique. • The electricity component is site electricity. No adjustment was made for the primary fuels consumed to produce the electricity. See "Glossary" for definition of site energy. • Data may not sum due to rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, the 1987 Residential Energy Consumption Survey.

**Figure 11. Energy Consumption per U.S. Household by End Uses for the Elderly and Nonelderly, 1987**



Notes: • End-use estimates are based on the 1987 Residential Energy Consumption Survey and were obtained using a nonlinear regression technique. • The electricity component is site electricity. No adjustment was made for the primary fuels consumed to produce the electricity. See "Glossary" for definition of site energy. • Data may not sum due to rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, 1987 Residential Energy Consumption Survey.

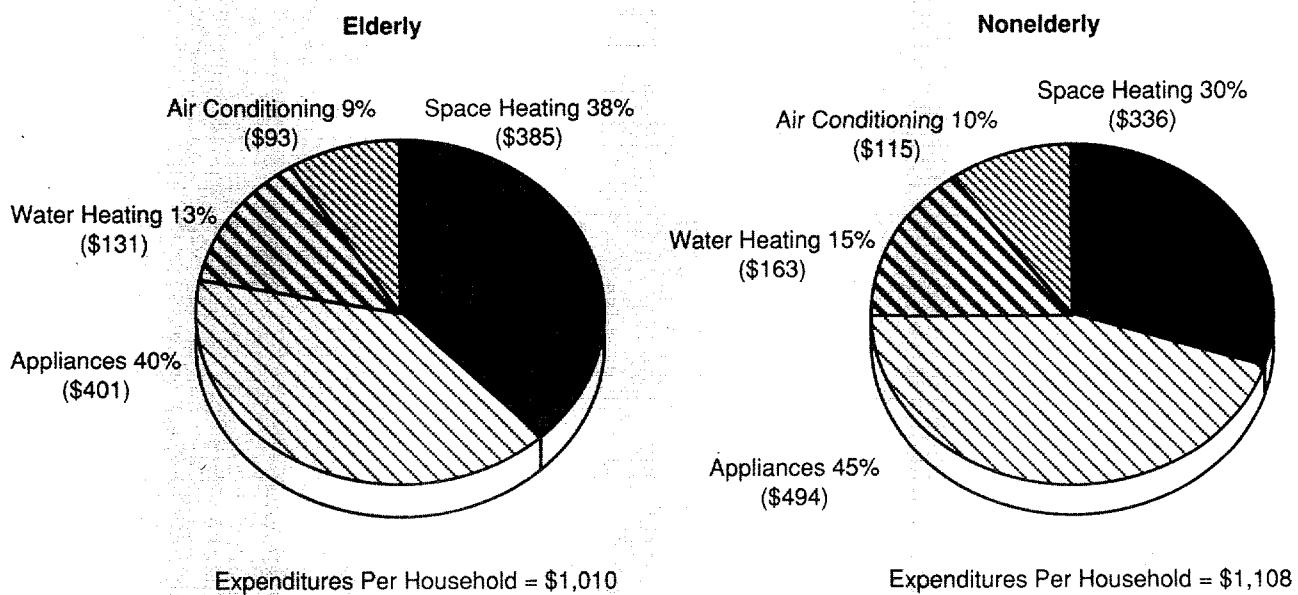
elderly for water heating, air conditioning, and appliances were 15 percent, 4 percent, and 19 percent, respectively. Figure 11 provides the proportion of energy used for the four end uses for the elderly and nonelderly.

Among the elderly, the proportion of total energy expenditures used for space heating was approximately 38 percent. Among the nonelderly it was approximately 30 percent (Figure 12).

**Changes in Consumption and Expenditure Patterns:**  
Both the elderly and nonelderly used less energy for

space heating and more energy for air conditioning in 1987 than in 1984. In the same time period, for nonelderly households only, there was a statistically significant decrease in the amount of energy used for water heating and an increase in the amount of energy used for appliances. The change in average energy expenditures between 1984 and 1987 mirrored the consumption patterns for space heating and air conditioning but not for water heating or appliances. Water-heating expenditures decreased for both the elderly and nonelderly, while appliance expenditures increased for both age categories (Figure 13).

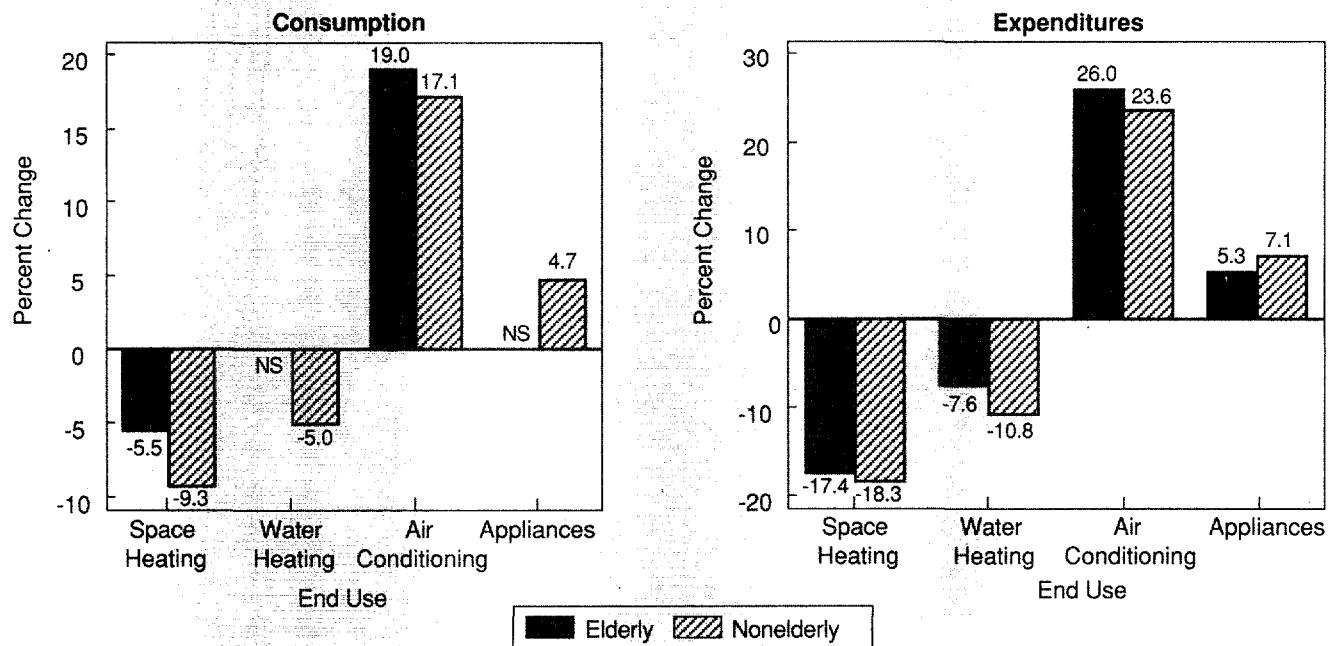
**Figure 12. Energy Expenditures per U.S. Household by End Uses for the Elderly and Nonelderly, 1987**



Notes: • End-use estimates are based on the 1987 Residential Energy Consumption Survey and were obtained using a nonlinear regression technique. • Data may not sum due to rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, 1987 Residential Energy Consumption Survey.

**Figure 13. Percent Change in Energy End-Use Consumption and Expenditures per U.S. Household for the Elderly and Nonelderly, 1984 and 1987**



NS= Not statistically significant at the .05 level.

Notes: • End-use estimates are based on the 1987 Residential Energy Consumption Survey and were obtained using a nonlinear regression technique. • Electricity component is site electricity. No adjustment was made for the primary fuels consumed to produce the electricity. See "Glossary" for definition of site energy.

Source: Energy Information Administration, Office of Energy Markets and End Use, 1984, and 1987 Residential Energy Consumption Surveys.



# Detailed Statistics

## Table Organization

The following tables present detailed energy consumption and expenditure data in the residential sector. Data are from the 1987 RECS.

There are two types of tables in this section. Tables 7 through 22, the Consumption and Expenditures Data Tables, provide household energy consumption and expenditure data that were obtained from the household's energy suppliers. Tables 23 through 32, the Energy End Use Tables, contain nonlinear regression estimates of energy consumption and expenditures by four end uses--space heating, water heating, air conditioning and appliances (See Appendix B, "End-Use Estimation Methodology"). All consumption and expenditure data are presented by housing structure characteristics and household characteristics. Tables have been grouped together to make it easier to find related

information. The Quick Reference Guide to the Detailed Statistics indicates the major topics of each table.

## Row and Column Factors

The tables present estimates of energy consumption and expenditures for all households in the United States. Since the estimates are based on the sample surveyed, they are subject to error. To help the reader compute an approximated relative standard error (RSE) for each of the estimates in the detailed tables, shaded row and column factors are displayed on the top line and in the far right column of each table, except in tables 13 and 21. To calculate the RSE for a specific estimate, multiply the row factor by the column factor (See Figure C1 and the related discussion in Appendix C, "Quality of the Data," for more details).

# Quick Reference Guide

## Quick Reference Guide to the Detailed Tables

| Data Item/Category                                       | Table Numbers |
|--|---------------|
| Consumption & Expenditures Data Tables                   |               |
| All Major Fuels  |               |
| Total Consumption & Expenditures                         | 7             |
| Percent Distribution of Total                            | 8             |
| Percent Distribution of Consumption                      | 9             |
| Percent Distribution of Expenditures                     | 10            |
| Average Consumption                                      | 11            |
| Average Expenditures                                     | 12            |
| Expenditures as a Percent of Income                      | 13            |
| Natural Gas Consumption & Expenditures                   |               |
| Total and Averages                                       | 14            |
| As Main Heating Fuel                                     | 15            |
| Electricity Consumption & Expenditures                   |               |
| Total and Averages                                       | 16            |
| As Main Heating Fuel                                     | 17            |
| Not as Main Heating Fuel                                 | 18            |
| Fuel Oil or Kerosene Consumption & Expenditures          | 19            |
| Liquefied Petroleum Gas (LPG) Consumption & Expenditures | 20            |
| Wood Consumption   | 21            |
| Energy Prices  | 22            |
| Energy End-Use Tables                                    |               |
| All Major Fuels  |               |
| Expenditures   | 23            |
| Natural Gas Consumption & Expenditures                   | 24            |
| Electricity Consumption & Expenditures                   | 25            |
| Fuel Oil or Kerosene Consumption & Expenditures          | 26            |
| Liquefied Petroleum Gas (LPG) Consumption & Expenditures | 27            |
| Space Heating  |               |
| With Natural Gas as Main Heating Fuel                    | 28            |
| With Electricity as Main Heating Fuel                    | 29            |
| With Fuel Oil, Kerosene, or LPG as Main Heating Fuel     | 30            |
| Water Heating  | 31            |
| Air Conditioning   | 32            |

## **Consumption and Expenditures Data Tables**

**Table 7. Household Energy Consumption and Expenditures by Major Fuel, 1987**

| Household Characteristics                  | All Major Fuels                |  |                                      | Natural Gas                              |                                      | Electricity                              |                                      | Fuel Oil or Kerosene                     |                                      | Liquefied Petroleum Gas                  |                                      | RSE Row Factors |
|--|--------------------------------|--|--------------------------------------|--|--------------------------------------|--|--------------------------------------|--|--------------------------------------|--|--------------------------------------|-----------------|
|  | Number of Households (million) | Total Amount Consumed (quad-billion Btu) | Total Expenditures (billion dollars) | Total Amount Consumed (quad-billion Btu) | Total Expenditures (billion dollars) | Total Amount Consumed (quad-billion Btu) | Total Expenditures (billion dollars) | Total Amount Consumed (quad-billion Btu) | Total Expenditures (billion dollars) | Total Amount Consumed (quad-billion Btu) | Total Expenditures (billion dollars) |                 |
|  | RSE Column Factors:            | 0.554                                    | 0.588                                | 0.565                                    | 0.905                                | 0.900                                    | 0.661                                | 0.637                                    | 1.531                                | 1.497                                    | 2.684                                | 2.576           |
| <b>Total U.S. Households .....</b>         | 90.5                           | 9.13                                     | 97.7                                 | 4.83                                     | 26.1                                 | 2.76                                     | 61.6                                 | 1.22                                     | 7.2                                  | 0.32                                     | .28                                  | 3.46            |
| <b>Census Region and Division</b>          |                                |  |                                      |  |                                      |  |                                      |  |                                      |  |                                      |                 |
| Northeast .....                            | 19.0                           | 2.37                                     | 24.3                                 | 1.03                                     | 6.7                                  | .44                                      | 12.3                                 | .87                                      | 5.1                                  | .02                                      | .2                                   | 5.81            |
| New England .....                          | 4.3                            | .52                                      | 5.2                                  | .15                                      | 1.0                                  | .10                                      | 2.6                                  | .26                                      | 1.6                                  | .01                                      | .1                                   | 8.06            |
| Middle Atlantic .....                      | 14.8                           | 1.85                                     | 19.1                                 | .89                                      | 5.7                                  | .35                                      | 9.8                                  | .61                                      | 3.5                                  | .01                                      | .1                                   | 6.76            |
| Midwest .....                              | 22.3                           | 2.73                                     | 25.0                                 | 1.83                                     | 9.0                                  | .61                                      | 14.1                                 | .16                                      | 1.0                                  | .13                                      | 1.0                                  | 5.77            |
| East North Central .....                   | 15.9                           | 1.99                                     | 18.2                                 | 1.35                                     | 6.8                                  | .42                                      | 10.0                                 | .13                                      | .8                                   | .08                                      | .7                                   | 6.99            |
| West North Central .....                   | 6.4                            | .74                                      | 6.8                                  | .48                                      | 2.2                                  | .19                                      | 4.1                                  | .02                                      | .1                                   | .05                                      | .3                                   | 9.44            |
| South .....                                | 30.9                           | 2.61                                     | 33.4                                 | 1.09                                     | 6.1                                  | 1.22                                     | 25.1                                 | .17                                      | 1.1                                  | .12                                      | 1.1                                  | 6.30            |
| South Atlantic .....                       | 15.6                           | 1.26                                     | 17.6                                 | .45                                      | 2.9                                  | .61                                      | 13.1                                 | .15                                      | .9                                   | .06                                      | .6                                   | 9.20            |
| East South Central .....                   | 6.1                            | .51                                      | 6.0                                  | .19                                      | .9                                   | .27                                      | 4.7                                  | .03                                      | .2                                   | .03                                      | .3                                   | 12.36           |
| West South Central .....                   | 9.2                            | .83                                      | 9.8                                  | .45                                      | 2.2                                  | .35                                      | 7.4                                  | Q  | Q                                    | Q  | Q                                    | 10.94           |
| West .....                                 | 18.3                           | 1.42                                     | 15.0                                 | .88                                      | 4.4                                  | .48                                      | 10.0                                 | .02                                      | .1                                   | .05                                      | .4                                   | 7.87            |
| Mountain .....                             | 4.4                            | .46                                      | 4.2                                  | .31                                      | 1.4                                  | .12                                      | 2.6                                  | Q  | Q                                    | Q  | Q                                    | 11.78           |
| Pacific .....                              | 13.9                           | .96                                      | 10.8                                 | .56                                      | 3.0                                  | .36                                      | 7.4                                  | Q  | .1                                   | .03                                      | .3                                   | 7.95            |
| <b>Metropolitan Status</b>                 |                                |  |                                      |  |                                      |  |                                      |  |                                      |  |                                      |                 |
| Metropolitan .....                         | 70.2                           | 7.23                                     | 76.8                                 | 4.07                                     | 22.3                                 | 2.07                                     | 47.6                                 | .96                                      | 5.6                                  | .13                                      | 1.3                                  | 3.60            |
| Central City .....                         | 29.6                           | 3.00                                     | 29.7                                 | 1.91                                     | 10.5                                 | .74                                      | 17.1                                 | .34                                      | 1.9                                  | .02                                      | .2                                   | 5.21            |
| Outside Central City .....                 | 40.6                           | 4.23                                     | 47.1                                 | 2.16                                     | 11.8                                 | 1.33                                     | 30.5                                 | .62                                      | 3.7                                  | .11                                      | 1.1                                  | 4.55            |
| Nonmetropolitan .....                      | 20.3                           | 1.90                                     | 21.0                                 | .76                                      | 3.9                                  | .69                                      | 14.0                                 | .26                                      | 1.6                                  | .19                                      | 1.5                                  | 7.47            |
| <b>Climate Zone</b>                        |                                |  |                                      |  |                                      |  |                                      |  |                                      |  |                                      |                 |
| Under 2,000 CDD and--                      |                                |  |                                      |  |                                      |  |                                      |  |                                      |  |                                      |                 |
| Over 7,000 HDD .....                       | 8.5                            | .94                                      | 8.8                                  | .42                                      | 2.1                                  | .23                                      | 4.8                                  | .21                                      | 1.2                                  | .08                                      | .7                                   | 19.61           |
| 5,500 to 7,000 HDD .....                   | 25.9                           | 3.26                                     | 30.0                                 | 2.09                                     | 10.6                                 | .69                                      | 16.3                                 | .44                                      | 2.6                                  | .05                                      | .5                                   | 8.73            |
| 4,000 to 5,499 HDD .....                   | 21.9                           | 2.34                                     | 24.9                                 | 1.09                                     | 6.6                                  | .67                                      | 14.9                                 | .51                                      | 2.9                                  | .06                                      | .5                                   | 10.94           |
| Under 4,000 HDD .....                      | 17.8                           | 1.38                                     | 16.6                                 | .73                                      | 4.1                                  | .53                                      | 11.5                                 | .05                                      | .4                                   | .07                                      | .7                                   | 14.32           |
| 2,000 CDD or More and --                   |                                |  |                                      |  |                                      |  |                                      |  |                                      |  |                                      |                 |
| Under 4,000 HDD .....                      | 16.3                           | 1.20                                     | 17.4                                 | .51                                      | 2.8                                  | .64                                      | 14.2                                 | Q  | Q                                    | .04                                      | .4                                   | 13.24           |
| <b>Payment Method for Utilities</b>        |                                |  |                                      |  |                                      |  |                                      |  |                                      |  |                                      |                 |
| All Paid by Household .....                | 73.7                           | 7.76                                     | 84.8                                 | 4.01                                     | 21.5                                 | 2.49                                     | 54.9                                 | .95                                      | 5.8                                  | .30                                      | 2.7                                  | 3.82            |
| Some Paid, Some in Rent .....              | 10.0                           | .78                                      | 7.6                                  | .47                                      | 2.8                                  | .14                                      | 4.0                                  | .16                                      | .8                                   | Q  | *                                    | 14.03           |
| All Included in Rent .....                 | 4.5                            | .38                                      | 3.2                                  | .24                                      | 1.3                                  | .07                                      | 1.6                                  | .06                                      | .3                                   | Q  | Q                                    | 15.65           |
| Other Method .....                         | 2.3                            | .20                                      | 2.1                                  | .11                                      | .6                                   | .05                                      | 1.2                                  | .05                                      | .3                                   | Q  | Q                                    | 20.96           |
| <b>Housing Structure by Status of Unit</b> |                                |  |                                      |  |                                      |  |                                      |  |                                      |  |                                      |                 |
| Single-Family Detached .....               | 55.2                           | 6.32                                     | 67.6                                 | 3.30                                     | 17.5                                 | 1.97                                     | 43.1                                 | .80                                      | 4.8                                  | .25                                      | 2.2                                  | 4.25            |
| Owned .....                                | 47.7                           | 5.56                                     | 60.0                                 | 2.86                                     | 15.2                                 | 1.76                                     | 38.5                                 | .73                                      | 4.4                                  | .21                                      | 1.9                                  | 4.44            |
| Rented .....                               | 7.4                            | .75                                      | 7.6                                  | .43                                      | 2.3                                  | .21                                      | 4.6                                  | .07                                      | .4                                   | .04                                      | .3                                   | 9.93            |
| Single-Family Attached .....               | 5.3                            | .53                                      | 6.0                                  | .29                                      | 1.7                                  | .16                                      | 3.8                                  | .07                                      | .5                                   | Q  | Q                                    | 20.82           |
| Owned .....                                | 3.9                            | .40                                      | 4.6                                  | .23                                      | 1.4                                  | .11                                      | 2.8                                  | .06                                      | .4                                   | Q  | Q                                    | 23.00           |
| Rented .....                               | 1.5                            | .12                                      | 1.5                                  | .06                                      | .4                                   | .05                                      | 1.1                                  | .01                                      | .1                                   | Q  | Q                                    | 30.76           |
| Building of 2 to 4 Units .....             | 10.1                           | .94                                      | 9.1                                  | .61                                      | 3.4                                  | .20                                      | 4.9                                  | .13                                      | .8                                   | Q  | Q                                    | 9.95            |
| Owned .....                                | 2.0                            | .24                                      | 2.3                                  | .15                                      | .9                                   | .04                                      | 1.1                                  | .05                                      | .3                                   | Q  | Q                                    | 19.12           |
| Rented .....                               | 8.1                            | .70                                      | 6.8                                  | .46                                      | 2.6                                  | .15                                      | 3.7                                  | .08                                      | .5                                   | Q  | Q                                    | 11.16           |
| Building of 5 or More Units .....          | 14.9                           | .96                                      | 10.1                                 | .51                                      | 2.8                                  | .28                                      | 6.5                                  | .17                                      | .8                                   | Q  | Q                                    | 12.53           |
| Owned .....                                | 4.0                            | .07                                      | .8                                   | .03                                      | .2                                   | .02                                      | .6                                   | Q  | Q                                    | NC                                       | NC                                   | 49.63           |
| Rented .....                               | 13.9                           | .89                                      | 9.3                                  | .48                                      | 2.7                                  | .25                                      | 5.9                                  | .16                                      | .8                                   | Q  | Q                                    | 12.79           |
| Mobile Home .....                          | 5.1                            | .39                                      | 4.8                                  | .12                                      | .6                                   | .16                                      | 3.3                                  | .05                                      | .3                                   | .06                                      | .6                                   | 15.74           |
| Owned .....                                | 4.3                            | .33                                      | 4.1                                  | .10                                      | .5                                   | .14                                      | 2.8                                  | .04                                      | .2                                   | .05                                      | .5                                   | 17.70           |
| Rented .....                               | .9                             | .06                                      | .8                                   | .02                                      | .1                                   | .02                                      | .5                                   | .01                                      | .1                                   | .01                                      | .1                                   | 24.53           |

See footnotes at end of table.

**Table 7. Household Energy Consumption and Expenditures by Major Fuel, 1987 (Continued)**

| Household Characteristics                              | All Major Fuels                |  |                                      | Natural Gas                              |                                      | Electricity                              |                                      | Fuel Oil or Kerosene                     |                                      | Liquefied Petroleum Gas                  |                                      | RSE Row Factors |
|--|--------------------------------|--|--------------------------------------|--|--------------------------------------|--|--------------------------------------|--|--------------------------------------|--|--------------------------------------|-----------------|
|  | Number of Households (million) | Total Amount Consumed (quad-billion Btu) | Total Expenditures (billion dollars) | Total Amount Consumed (quad-billion Btu) | Total Expenditures (billion dollars) | Total Amount Consumed (quad-billion Btu) | Total Expenditures (billion dollars) | Total Amount Consumed (quad-billion Btu) | Total Expenditures (billion dollars) | Total Amount Consumed (quad-billion Btu) | Total Expenditures (billion dollars) |                 |
|  | RSE Column Factors:            | 0.554                                    | 0.588                                | 0.565                                    | 0.905                                | 0.900                                    | 0.661                                | 0.637                                    | 1.531                                | 1.497                                    | 2.684                                | 2.576           |
| <b>Number of Rooms</b>                                 |                                |  |                                      |  |                                      |  |                                      |  |                                      |  |                                      |                 |
| 1  | 0.7                            | 0.03                                     | 0.4                                  | 0.02                                     | 0.1                                  | 0.01                                     | 0.2                                  | Q  | Q                                    | Q  | Q                                    | 47.50           |
| 2  | 2.4                            | .13                                      | 1.2                                  | .06                                      | .3                                   | .03                                      | .7                                   | 0.03                                     | 0.1                                  | Q  | Q                                    | 22.77           |
| 3  | 9.8                            | .59                                      | 6.5                                  | .29                                      | 1.6                                  | .18                                      | 4.2                                  | .10                                      | .5                                   | 0.02                                     | 0.2                                  | 11.53           |
| 4  |                                |  |                                      |  |                                      |  |                                      |  |                                      |  |                                      |                 |
| 5  | 17.7                           | 1.37                                     | 14.9                                 | .70                                      | 3.8                                  | .42                                      | 9.3                                  | .16                                      | .9                                   | .08                                      | .8                                   | 7.41            |
| 6  | 20.9                           | 2.01                                     | 21.5                                 | 1.07                                     | 5.7                                  | .61                                      | 13.5                                 | .25                                      | 1.5                                  | .08                                      | .7                                   | 5.79            |
| 7  | 17.4                           | 1.97                                     | 21.1                                 | 1.09                                     | 5.9                                  | .59                                      | 13.5                                 | .23                                      | 1.4                                  | .05                                      | .4                                   | 7.12            |
| 8 or More  | 11.2                           | 1.43                                     | 15.4                                 | .76                                      | 4.2                                  | .44                                      | 9.8                                  | .20                                      | 1.2                                  | .04                                      | .3                                   | 8.26            |
|  | 10.4                           | 1.59                                     | 16.7                                 | .83                                      | 4.5                                  | .47                                      | 10.4                                 | .25                                      | 1.5                                  | .04                                      | .3                                   | 8.71            |
| <b>Number of Rooms That Can Be Air Conditioned</b>     |                                |  |                                      |  |                                      |  |                                      |  |                                      |  |                                      |                 |
| All  | 40.8                           | 3.95                                     | 47.5                                 | 2.00                                     | 10.7                                 | 1.58                                     | 34.3                                 | .24                                      | 1.4                                  | .13                                      | 1.1                                  | 5.36            |
| Some   | 16.8                           | 1.97                                     | 19.5                                 | 1.06                                     | 6.0                                  | .44                                      | 10.6                                 | .41                                      | 2.5                                  | .06                                      | .5                                   | 6.11            |
| None   | 32.9                           | 3.21                                     | 30.7                                 | 1.77                                     | 9.5                                  | .74                                      | 16.7                                 | .57                                      | 3.3                                  | .13                                      | 1.2                                  | 6.83            |
| <b>Measured Heated Area of Residence (square feet)</b> |                                |  |                                      |  |                                      |  |                                      |  |                                      |  |                                      |                 |
| Fewer than 600   | 8.4                            | .53                                      | 5.7                                  | .26                                      | 1.4                                  | .14                                      | 3.4                                  | .11                                      | .6                                   | .03                                      | .3                                   | 9.23            |
| 600 to 999   | 23.9                           | 1.85                                     | 19.7                                 | 1.01                                     | 5.5                                  | .55                                      | 12.3                                 | .22                                      | 1.2                                  | .08                                      | .7                                   | 6.37            |
| 1,000 to 1,599   | 25.6                           | 2.37                                     | 26.7                                 | 1.17                                     | 6.3                                  | .83                                      | 17.9                                 | .26                                      | 1.6                                  | .11                                      | .9                                   | 5.90            |
| 1,600 to 1,999   | 11.3                           | 1.28                                     | 13.9                                 | .69                                      | 3.8                                  | .40                                      | 8.9                                  | .16                                      | 1.0                                  | .04                                      | .3                                   | 7.53            |
| 2,000 to 2,399   | 8.4                            | 1.10                                     | 11.5                                 | .62                                      | 3.4                                  | .31                                      | 7.0                                  | .14                                      | .9                                   | .02                                      | .2                                   | 10.09           |
| 2,400 to 2,999   | 7.7                            | 1.12                                     | 11.2                                 | .64                                      | 3.4                                  | .29                                      | 6.6                                  | .17                                      | 1.0                                  | .02                                      | .2                                   | 9.58            |
| 3,000 or More  | 5.3                            | .89                                      | 9.1                                  | .44                                      | 2.3                                  | .25                                      | 5.5                                  | .17                                      | 1.0                                  | .03                                      | .2                                   | 10.80           |
| <b>Year of Construction</b>                            |                                |  |                                      |  |                                      |  |                                      |  |                                      |  |                                      |                 |
| 1939 or Before   | 21.5                           | 2.59                                     | 23.7                                 | 1.53                                     | 8.4                                  | .48                                      | 11.7                                 | .51                                      | 3.0                                  | .07                                      | .6                                   | 7.29            |
| 1940 to 1949   | 8.2                            | .85                                      | 8.6                                  | .48                                      | 2.7                                  | .22                                      | 4.9                                  | .13                                      | .7                                   | .03                                      | .3                                   | 10.05           |
| 1950 to 1959   | 13.1                           | 1.43                                     | 14.6                                 | .79                                      | 4.2                                  | .38                                      | 8.7                                  | .22                                      | 1.3                                  | .04                                      | .4                                   | 7.43            |
| 1960 to 1969   | 16.4                           | 1.63                                     | 17.4                                 | .92                                      | 5.1                                  | .50                                      | 11.0                                 | .18                                      | 1.0                                  | .04                                      | .3                                   | 8.50            |
| 1970 to 1974   | 9.6                            | .92                                      | 10.2                                 | .49                                      | 2.5                                  | .31                                      | 6.8                                  | .07                                      | .4                                   | .05                                      | .5                                   | 10.35           |
| 1975 to 1979   | 10.5                           | .90                                      | 11.9                                 | .34                                      | 1.7                                  | .44                                      | 9.3                                  | .08                                      | .5                                   | .05                                      | .4                                   | 10.11           |
| 1980 to 1984   | 7.4                            | .53                                      | 7.3                                  | .20                                      | 1.1                                  | .28                                      | 5.8                                  | .02                                      | .1                                   | .03                                      | .2                                   | 15.02           |
| 1985 or After  | 3.9                            | .27                                      | 4.0                                  | .10                                      | .5                                   | .15                                      | 3.3                                  | Q  | Q                                    | .01                                      | .1                                   | 20.11           |
| <b>Status of Unit</b>                                  |                                |  |                                      |  |                                      |  |                                      |  |                                      |  |                                      |                 |
| Owned  | 58.8                           | 6.60                                     | 71.8                                 | 3.38                                     | 18.2                                 | 2.07                                     | 45.8                                 | .89                                      | 5.4                                  | .27                                      | 2.4                                  | 4.21            |
| Condominium  | 1.5                            | .11                                      | 1.4                                  | .06                                      | .3                                   | .04                                      | 1.0                                  | Q  | Q                                    | NC                                       | NC                                   | 39.41           |
| Not a Condominium                                      | 57.3                           | 6.49                                     | 70.4                                 | 3.32                                     | 17.9                                 | 2.02                                     | 44.8                                 | .88                                      | 5.3                                  | .27                                      | 2.4                                  | 4.25            |
| Rented   | 31.7                           | 2.53                                     | 26.0                                 | 1.45                                     | 8.0                                  | .69                                      | 15.7                                 | .34                                      | 1.8                                  | .05                                      | .4                                   | 5.94            |
| Public Housing   | 2.5                            | .18                                      | 1.7                                  | .10                                      | .6                                   | .04                                      | .9                                   | .03                                      | .1                                   | Q  | Q                                    | 25.64           |
| Not Public Housing                                     | 29.2                           | 2.35                                     | 24.3                                 | 1.35                                     | 7.4                                  | .65                                      | 14.8                                 | .31                                      | 1.7                                  | .05                                      | .4                                   | 6.40            |
| Rent Subsidy   | 1.4                            | .11                                      | 1.1                                  | .06                                      | .4                                   | .03                                      | .7                                   | .02                                      | .1                                   | Q  | Q                                    | 25.21           |
| No Rent Subsidy  | 27.8                           | 2.25                                     | 23.2                                 | 1.29                                     | 7.0                                  | .62                                      | 14.2                                 | .29                                      | 1.6                                  | .05                                      | .4                                   | 6.72            |
| <b>1987 Family Income</b>                              |                                |  |                                      |  |                                      |  |                                      |  |                                      |  |                                      |                 |
| Less than \$5,000                                      | 6.2                            | .51                                      | 5.1                                  | .30                                      | 1.6                                  | .13                                      | 2.8                                  | .05                                      | .3                                   | .03                                      | .3                                   | 13.20           |
| \$5,000 to \$9,999                                     | 11.5                           | 1.03                                     | 10.1                                 | .57                                      | 3.0                                  | .26                                      | 5.8                                  | .16                                      | .9                                   | .04                                      | .4                                   | 9.04            |
| \$10,000 to \$14,999                                   | 12.6                           | 1.15                                     | 11.7                                 | .62                                      | 3.3                                  | .31                                      | 6.9                                  | .16                                      | .9                                   | .06                                      | .5                                   | 7.98            |
| \$15,000 to \$19,999                                   | 9.0                            | .83                                      | 8.7                                  | .45                                      | 2.4                                  | .24                                      | 5.3                                  | .11                                      | .7                                   | .03                                      | .3                                   | 8.29            |
| \$20,000 to \$24,999                                   | 8.8                            | .84                                      | 9.1                                  | .42                                      | 2.2                                  | .27                                      | 5.9                                  | .12                                      | .7                                   | .03                                      | .3                                   | 8.91            |
| \$25,000 to \$34,999                                   | 16.2                           | 1.60                                     | 17.7                                 | .81                                      | 4.4                                  | .52                                      | 11.5                                 | .22                                      | 1.3                                  | .05                                      | .5                                   | 6.40            |
| \$35,000 to \$49,999                                   | 13.4                           | 1.50                                     | 16.8                                 | .77                                      | 4.2                                  | .51                                      | 11.2                                 | .19                                      | 1.1                                  | .03                                      | .2                                   | 7.36            |
| \$50,000 or More                                       | 12.9                           | 1.67                                     | 18.6                                 | .90                                      | 4.9                                  | .52                                      | 12.1                                 | .22                                      | 1.3                                  | .03                                      | .3                                   | 8.20            |

See footnotes at end of table.

**Table 7. Household Energy Consumption and Expenditures by Major Fuel, 1987 (Continued)**

| Household Characteristics                             | All Major Fuels                |   |                                      | Natural Gas                             |                                      | Electricity                             |                                      | Fuel Oil or Kerosene                    |                                      | Liquefied Petroleum Gas                 |                                      | RSE Row Factors |
|---|--------------------------------|---|--------------------------------------|---|--------------------------------------|---|--------------------------------------|---|--------------------------------------|---|--------------------------------------|-----------------|
|   | Number of Households (million) | Total Amount Consumed (quadrillion Btu) | Total Expenditures (billion dollars) | Total Amount Consumed (quadrillion Btu) | Total Expenditures (billion dollars) | Total Amount Consumed (quadrillion Btu) | Total Expenditures (billion dollars) | Total Amount Consumed (quadrillion Btu) | Total Expenditures (billion dollars) | Total Amount Consumed (quadrillion Btu) | Total Expenditures (billion dollars) |                 |
|   | RSE Column Factors:            | 0.554                                   | 0.588                                | 0.565                                   | 0.905                                | 0.900                                   | 0.661                                | 0.637                                   | 1.531                                | 1.497                                   | 2.684                                | 2.576           |
| <b>Below 100 Percent of Poverty Line</b>              | 11.8                           | 1.05                                    | 10.6                                 | 0.60                                    | 3.3                                  | 0.28                                    | 6.2                                  | 0.11                                    | 0.6                                  | 0.07                                    | 0.6                                  | 9.68            |
| <b>Below 125 Percent of Poverty Line</b>              | 18.2                           | 1.65                                    | 16.7                                 | .93                                     | 5.0                                  | .44                                     | 9.8                                  | .19                                     | 1.1                                  | .09                                     | .8                                   | 7.91            |
| <b>Assistance for Heating in Winter</b>               |                                |   |                                      |   |                                      |   |                                      |   |                                      |   |                                      |                 |
| Yes   | 4.8                            | .48                                     | 4.6                                  | .28                                     | 1.5                                  | .10                                     | 2.4                                  | .05                                     | .3                                   | .04                                     | .3                                   | 12.36           |
| No  | 85.8                           | 8.65                                    | 93.2                                 | 4.55                                    | 24.6                                 | 2.65                                    | 59.2                                 | 1.17                                    | 6.9                                  | .28                                     | 2.5                                  | 3.34            |
| <b>Assistance for Weatherization of Residence</b>     |                                |   |                                      |   |                                      |   |                                      |   |                                      |   |                                      |                 |
| Yes   | 1.0                            | .10                                     | .9                                   | .06                                     | .3                                   | .02                                     | .5                                   | .01                                     | .1                                   | Q                                       | Q                                    | 23.10           |
| No  | 89.5                           | 9.03                                    | 96.8                                 | 4.77                                    | 25.8                                 | 2.74                                    | 61.1                                 | 1.21                                    | 7.1                                  | .31                                     | 2.8                                  | 3.26            |
| <b>Household Owns or Has Regular Use of a Vehicle</b> |                                |   |                                      |   |                                      |   |                                      |   |                                      |   |                                      |                 |
| Yes   | 79.4                           | 8.09                                    | 88.0                                 | 4.22                                    | 22.6                                 | 2.57                                    | 56.9                                 | 1.01                                    | 6.0                                  | .29                                     | 2.5                                  | 3.35            |
| No  | 11.1                           | 1.04                                    | 9.7                                  | .61                                     | 3.6                                  | .19                                     | 4.7                                  | .22                                     | 1.2                                  | .03                                     | .3                                   | 8.45            |
| <b>Race of Householder</b>                            |                                |   |                                      |   |                                      |   |                                      |   |                                      |   |                                      |                 |
| White   | 76.6                           | 7.68                                    | 83.3                                 | 3.95                                    | 21.0                                 | 2.42                                    | 53.6                                 | 1.04                                    | 6.1                                  | .28                                     | 2.5                                  | 3.54            |
| Black   | 10.9                           | 1.21                                    | 12.0                                 | .75                                     | 4.4                                  | .28                                     | 6.5                                  | .16                                     | .9                                   | .02                                     | .2                                   | 12.22           |
| Other   | 3.0                            | .24                                     | 2.5                                  | .14                                     | .7                                   | .06                                     | 1.5                                  | .03                                     | .2                                   | Q                                       | Q                                    | 16.22           |
| <b>Householder of Hispanic Descent</b>                |                                |   |                                      |   |                                      |   |                                      |   |                                      |   |                                      |                 |
| Yes   | 5.0                            | .44                                     | 4.9                                  | .23                                     | 1.3                                  | .13                                     | 3.2                                  | .06                                     | .3                                   | .01                                     | .1                                   | 12.81           |
| No  | 85.5                           | 8.69                                    | 92.9                                 | 4.60                                    | 24.9                                 | 2.63                                    | 58.4                                 | 1.16                                    | 6.9                                  | .30                                     | 2.7                                  | 3.35            |
| <b>Age of Householder</b>                             |                                |   |                                      |   |                                      |   |                                      |   |                                      |   |                                      |                 |
| Under 25 Years  | 6.5                            | .50                                     | 5.4                                  | .28                                     | 1.5                                  | .16                                     | 3.5                                  | .05                                     | .3                                   | .01                                     | .1                                   | 13.37           |
| 25 to 34 Years  | 21.5                           | 2.02                                    | 21.9                                 | 1.11                                    | 6.0                                  | .63                                     | 14.1                                 | .22                                     | 1.3                                  | .06                                     | .5                                   | 5.82            |
| 35 to 44 Years  | 18.0                           | 1.90                                    | 21.3                                 | .96                                     | 5.1                                  | .64                                     | 14.2                                 | .25                                     | 1.5                                  | .06                                     | .5                                   | 6.28            |
| 45 to 59 Years  | 18.9                           | 2.13                                    | 23.3                                 | 1.10                                    | 6.0                                  | .68                                     | 15.0                                 | .27                                     | 1.6                                  | .08                                     | .7                                   | 5.83            |
| 60 Years and Over                                     | 25.7                           | 2.58                                    | 25.9                                 | 1.38                                    | 7.6                                  | .66                                     | 14.8                                 | .43                                     | 2.5                                  | .11                                     | 1.0                                  | .69             |
| <b>Household Size</b>                                 |                                |   |                                      |   |                                      |   |                                      |   |                                      |   |                                      |                 |
| 1 Person  | 21.6                           | 1.71                                    | 16.6                                 | .99                                     | 5.3                                  | .42                                     | 9.4                                  | .25                                     | 1.4                                  | .06                                     | .6                                   | 5.90            |
| 2 Persons   | 30.7                           | 2.95                                    | 31.9                                 | 1.51                                    | 8.1                                  | .92                                     | 20.4                                 | .42                                     | 2.5                                  | .10                                     | .9                                   | 5.24            |
| 3 Persons   | 15.4                           | 1.66                                    | 18.2                                 | .85                                     | 4.6                                  | .54                                     | 11.8                                 | .22                                     | 1.3                                  | .05                                     | .4                                   | 5.86            |
| 4 Persons   | 13.6                           | 1.64                                    | 18.0                                 | .86                                     | 4.6                                  | .53                                     | 11.7                                 | .20                                     | 1.2                                  | .06                                     | .6                                   | 6.92            |
| 5 Persons   | 6.1                            | .75                                     | 8.4                                  | .41                                     | 2.3                                  | .24                                     | 5.4                                  | .08                                     | .5                                   | .02                                     | .2                                   | 9.80            |
| 6 or More Persons                                     | 3.1                            | .41                                     | 4.5                                  | .21                                     | 1.2                                  | .12                                     | 2.9                                  | .05                                     | .3                                   | .02                                     | .2                                   | 15.07           |
| <b>Secondary Heating</b>                              |                                |   |                                      |   |                                      |   |                                      |   |                                      |   |                                      |                 |
| Yes   | 37.4                           | 4.00                                    | 44.7                                 | 1.89                                    | 10.1                                 | 1.38                                    | 29.7                                 | .54                                     | 3.3                                  | .18                                     | 1.6                                  | 5.04            |
| Over 33 Percent of Home's Total Heat                  | 3.2                            | .30                                     | 3.6                                  | .09                                     | .5                                   | .12                                     | 2.6                                  | .07                                     | .4                                   | .02                                     | .1                                   | 12.92           |
| No  | 53.2                           | 5.13                                    | 53.1                                 | 2.94                                    | 16.1                                 | 1.37                                    | 31.9                                 | .68                                     | 3.9                                  | .13                                     | 1.2                                  | 3.98            |

See footnotes at end of table.

**Table 7. Household Energy Consumption and Expenditures by Major Fuel, 1987 (Continued)**

| Household Characteristics                        | All Major Fuels                |  |                                      | Natural Gas                              |                                      | Electricity                              |                                      | Fuel Oil or Kerosene                     |                                      | Liquefied Petroleum Gas                  |                                      | RSE Row Factors |
|--|--------------------------------|--|--------------------------------------|--|--------------------------------------|--|--------------------------------------|--|--------------------------------------|--|--------------------------------------|-----------------|
|  | Number of Households (million) | Total Amount Consumed (quad-billion Btu) | Total Expenditures (billion dollars) | Total Amount Consumed (quad-billion Btu) | Total Expenditures (billion dollars) | Total Amount Consumed (quad-billion Btu) | Total Expenditures (billion dollars) | Total Amount Consumed (quad-billion Btu) | Total Expenditures (billion dollars) | Total Amount Consumed (quad-billion Btu) | Total Expenditures (billion dollars) |                 |
|  | RSE Column Factors:            | 0.554                                    | 0.588                                | 0.565                                    | 0.905                                | 0.900                                    | 0.661                                | 0.637                                    | 1.531                                | 1.497                                    | 2.684                                | 2.576           |
| <b>Fuel Combinations</b>                         |                                |  |                                      |  |                                      |  |                                      |  |                                      |  |                                      |                 |
| Use Natural Gas for Main Heat .....              | 50.0                           | 5.89                                     | 53.7                                 | 4.65                                     | 24.8                                 | 1.22                                     | 28.6                                 | 0.03                                     | 0.2                                  | Q  | Q                                    | 7.07            |
| Use Natural Gas To Heat Water and Have A/C ..... | 28.6                           | 3.48                                     | 32.7                                 | 2.70                                     | 14.4                                 | .76                                      | 18.2                                 | .02                                      | .1                                   | Q  | Q                                    | 8.70            |
| and Lack A/C .....                               | 16.3                           | 1.85                                     | 15.1                                 | 1.57                                     | 8.3                                  | .27                                      | 6.7                                  | Q  | Q                                    | NC                                       | NC                                   | 9.03            |
| Use Electricity To Heat Water and Have A/C ..... | 3.4                            | .37                                      | 4.0                                  | .24                                      | 1.3                                  | .13                                      | 2.7                                  | *  | *                                    | Q  | Q                                    | 17.65           |
| and Lack A/C .....                               | 1.6                            | .17                                      | 1.6                                  | .13                                      | .7                                   | .05                                      | .9                                   | Q  | Q                                    | NC                                       | NC                                   | 16.95           |
| Other .....                                      | .2                             | .02                                      | .3                                   | .02                                      | .1                                   | .01                                      | .2                                   | Q  | Q                                    | Q  | Q                                    | 43.75           |
| Use Electricity for Main Heat .....              | 17.9                           | .97                                      | 18.6                                 | .06                                      | .3                                   | .90                                      | 18.1                                 | .01                                      | .1                                   | 0.01                                     | 0.1                                  | 12.15           |
| Use Electricity To Heat Water and Have A/C ..... | 12.4                           | .71                                      | 14.3                                 | .01                                      | *                                    | .70                                      | 14.1                                 | .01                                      | .1                                   | *  | .1                                   | 16.14           |
| and Lack A/C .....                               | 3.0                            | .14                                      | 2.4                                  | Q  | Q                                    | .13                                      | 2.4                                  | Q  | *                                    | Q  | Q                                    | 23.42           |
| Other .....                                      | 2.5                            | .12                                      | 1.9                                  | .05                                      | .3                                   | .07                                      | 1.6                                  | Q  | Q                                    | Q  | Q                                    | 28.70           |
| Use Fuel Oil for Main Heat .....                 | 10.9                           | 1.43                                     | 14.0                                 | .07                                      | .7                                   | .27                                      | 6.9                                  | 1.08                                     | 6.2                                  | .01                                      | .2                                   | 8.56            |
| Use Fuel Oil To Heat Water and Have A/C .....    | 2.6                            | .37                                      | 3.6                                  | .01                                      | .1                                   | .05                                      | 1.7                                  | .31                                      | 1.8                                  | *  | *                                    | 17.09           |
| and Lack A/C .....                               | 2.5                            | .33                                      | 2.8                                  | .01                                      | .1                                   | .03                                      | 1.1                                  | .28                                      | 1.6                                  | *  | *                                    | 13.63           |
| Use Electricity To Heat Water and Have A/C ..... | 2.0                            | .26                                      | 2.8                                  | Q  | Q                                    | .08                                      | 1.7                                  | .17                                      | 1.0                                  | Q  | Q                                    | 17.40           |
| and Lack A/C .....                               | 2.1                            | .24                                      | 2.5                                  | Q  | Q                                    | .07                                      | 1.5                                  | .16                                      | .9                                   | Q  | *                                    | 18.10           |
| Other .....                                      | 1.7                            | .24                                      | 2.3                                  | .05                                      | .4                                   | .03                                      | .9                                   | .15                                      | .9                                   | .01                                      | .1                                   | 14.26           |
| Use Wood for Main Heat .....                     | 5.1                            | .29                                      | 4.4                                  | .05                                      | .3                                   | .18                                      | 3.6                                  | .04                                      | .2                                   | .03                                      | .3                                   | 16.45           |
| Use LPG for Main Heat .....                      | 4.1                            | .38                                      | 4.8                                  | NC                                       | NC                                   | .12                                      | 2.7                                  | .01                                      | .1                                   | .25                                      | 2.1                                  | 16.78           |
| Use Kerosene for Main Heat .....                 | 1.3                            | .11                                      | 1.4                                  | Q  | Q                                    | .04                                      | .9                                   | .06                                      | .4                                   | *  | .1                                   | 23.68           |
| Use Coal for Main Heat .....                     | .4                             | .01                                      | .2                                   | Q  | Q                                    | .01                                      | .2                                   | Q  | Q                                    | Q  | Q                                    | 69.02           |
| No Heating Fuel/Other Fuel .....                 | .8                             | .03                                      | .7                                   | Q  | Q                                    | .02                                      | .6                                   | Q  | Q                                    | *  | *                                    | 25.20           |

NC No cases in sample.

\* Data cannot be displayed due to rounding.

Q Data withheld either because the RSE was greater than 50 percent or fewer than 10 households were sampled.

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

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Forms EIA-457 A, B, C, D, E, F, G of the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).

**Table 8. Percentage of Consumption Across Household Characteristics by Major Fuels, 1987**  
(Percent)

| Household Characteristics                  | All Major Fuels      |                    |                    | Natural Gas        |                    | Electricity        |                    | Fuel Oil or Kerosene |                    | Liquefied Petroleum Gas |                    | RSE Row Factors |
|--|----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|----------------------|--------------------|-------------------------|--------------------|-----------------|
|  | Number of Households | Total Btu Consumed | Total Expenditures | Total Btu Consumed | Total Expenditures | Total Btu Consumed | Total Expenditures | Total Btu Consumed   | Total Expenditures | Total Btu Consumed      | Total Expenditures |                 |
|  | RSE Column Factors:  | 0.614              | 0.631              | 0.620              | 0.868              | 0.859              | 0.708              | 0.688                | 1.440              | 1.416                   | 2.406              | 2.332           |
| <b>Total U.S. Households</b>               | 100.0                | 100.0              | 100.0              | 100.0              | 100.0              | 100.0              | 100.0              | 100.0                | 100.0              | 100.0                   | 100.0              | 0.00            |
| <b>Census Region and Division</b>          |                      |                    |                    |                    |                    |                    |                    |                      |                    |                         |                    |                 |
| Northeast .....                            | 21.0                 | 26.0               | 24.9               | 21.4               | 25.5               | 16.1               | 20.0               | 71.4                 | 70.3               | 5.7                     | 8.5                | 4.90            |
| New England .....                          | 4.7                  | 5.7                | 5.3                | 3.0                | 3.8                | 3.6                | 4.2                | 21.5                 | 21.6               | 2.8                     | 3.7                | 8.50            |
| Middle Atlantic .....                      | 16.3                 | 20.3               | 19.5               | 18.3               | 21.7               | 12.6               | 15.9               | 49.9                 | 48.7               | 2.9                     | 4.8                | 5.94            |
| Midwest .....                              | 24.6                 | 29.9               | 25.6               | 37.8               | 34.4               | 22.1               | 22.9               | 13.0                 | 13.2               | 41.6                    | 35.4               | 5.33            |
| East North Central .....                   | 17.5                 | 21.8               | 18.6               | 27.9               | 25.9               | 15.2               | 16.2               | 11.0                 | 11.2               | 26.5                    | 24.3               | 6.55            |
| West North Central .....                   | 7.1                  | 8.1                | 7.0                | 9.9                | 8.6                | 6.9                | 6.7                | 2.0                  | 1.9                | 15.1                    | 11.0               | 9.91            |
| South .....                                | 34.1                 | 28.5               | 34.2               | 22.7               | 23.1               | 44.2               | 40.8               | 14.1                 | 15.0               | 37.9                    | 40.7               | 5.28            |
| South Atlantic .....                       | 17.2                 | 13.8               | 18.0               | 9.3                | 11.2               | 22.0               | 21.2               | 11.9                 | 12.6               | 18.3                    | 22.9               | 8.75            |
| East South Central .....                   | 6.7                  | 5.6                | 6.2                | 3.9                | 3.6                | 9.6                | 7.6                | 2.0                  | 2.3                | 10.0                    | 10.3               | 12.52           |
| West South Central .....                   | 10.2                 | 9.1                | 10.0               | 9.4                | 8.4                | 12.6               | 12.0               | Q                    | Q                  | Q                       | 7.5                | 11.04           |
| West .....                                 | 20.2                 | 15.6               | 15.4               | 18.1               | 16.9               | 17.5               | 16.3               | 1.5                  | 1.6                | 14.8                    | 15.4               | 8.10            |
| Mountain .....                             | 4.9                  | 5.0                | 4.3                | 6.5                | 5.4                | 4.5                | 4.3                | Q                    | Q                  | Q                       | Q                  | 11.27           |
| Pacific .....                              | 15.3                 | 10.6               | 11.1               | 11.7               | 11.5               | 13.1               | 12.0               | Q                    | 1.2                | 8.6                     | 11.0               | 8.10            |
| <b>Metropolitan Status</b>                 |                      |                    |                    |                    |                    |                    |                    |                      |                    |                         |                    |                 |
| Metropolitan .....                         | 77.6                 | 79.2               | 78.5               | 84.3               | 85.2               | 75.0               | 77.3               | 78.4                 | 77.8               | 41.2                    | 45.0               | 2.99            |
| Central City .....                         | 32.7                 | 32.9               | 30.4               | 39.6               | 40.0               | 26.8               | 27.8               | 27.4                 | 25.9               | 5.3                     | 6.9                | 4.85            |
| Outside Central City .....                 | 44.8                 | 46.3               | 48.2               | 44.7               | 45.2               | 48.2               | 49.5               | 50.9                 | 51.9               | 35.9                    | 38.1               | 3.40            |
| Nonmetropolitan .....                      | 22.4                 | 20.8               | 21.5               | 15.7               | 14.8               | 25.0               | 22.7               | 21.6                 | 22.2               | 58.8                    | 55.0               | 6.11            |
| <b>Climate Zone</b>                        |                      |                    |                    |                    |                    |                    |                    |                      |                    |                         |                    |                 |
| Under 2,000 CDD and--                      |                      |                    |                    |                    |                    |                    |                    |                      |                    |                         |                    |                 |
| Over 7,000 HDD .....                       | 9.4                  | 10.3               | 9.0                | 8.6                | 8.0                | 8.4                | 7.8                | 17.3                 | 17.0               | 26.0                    | 23.4               | 18.75           |
| 5,500 to 7,000 HDD .....                   | 28.6                 | 35.8               | 30.7               | 43.2               | 40.5               | 24.9               | 26.5               | 35.7                 | 36.4               | 17.2                    | 17.4               | 8.52            |
| 4,000 to 5,499 HDD .....                   | 24.2                 | 25.6               | 25.5               | 22.6               | 25.3               | 24.3               | 24.1               | 41.9                 | 40.7               | 20.3                    | 18.4               | 10.56           |
| Under 4,000 HDD .....                      | 19.7                 | 15.1               | 17.0               | 15.1               | 15.7               | 19.1               | 18.6               | 4.4                  | 4.9                | 23.3                    | 25.0               | 14.21           |
| 2,000 CDD or More and --                   |                      |                    |                    |                    |                    |                    |                    |                      |                    |                         |                    |                 |
| Under 4,000 HDD .....                      | 18.0                 | 13.2               | 17.8               | 10.5               | 10.6               | 23.4               | 23.0               | Q                    | Q                  | 13.2                    | 15.8               | 12.97           |
| <b>Payment Method for Utilities</b>        |                      |                    |                    |                    |                    |                    |                    |                      |                    |                         |                    |                 |
| All Paid by Household .....                | 81.5                 | 85.0               | 86.8               | 83.0               | 82.2               | 90.5               | 89.1               | 77.5                 | 80.2               | 95.6                    | 95.4               | 1.53            |
| Some Paid, Some in Rent .....              | 11.1                 | 8.6                | 7.8                | 9.8                | 10.7               | 5.2                | 6.4                | 13.4                 | 11.7               | Q                       | Q                  | 13.38           |
| All Included in Rent .....                 | 5.0                  | 4.2                | 3.2                | 5.0                | 4.8                | 2.6                | 2.5                | 5.2                  | 4.1                | Q                       | Q                  | 14.66           |
| Other Method .....                         | 2.5                  | 2.2                | 2.1                | 2.2                | 2.3                | 1.7                | 1.9                | 3.9                  | 4.1                | Q                       | Q                  | 20.69           |
| <b>Housing Structure by Status of Unit</b> |                      |                    |                    |                    |                    |                    |                    |                      |                    |                         |                    |                 |
| Single-Family Detached .....               | 60.9                 | 69.2               | 69.2               | 68.3               | 66.9               | 71.4               | 70.0               | 65.2                 | 66.9               | 79.7                    | 77.5               | 2.37            |
| Owned .....                                | 52.7                 | 60.9               | 61.4               | 59.3               | 58.2               | 63.7               | 62.6               | 59.4                 | 60.9               | 68.0                    | 66.1               | 2.60            |
| Rented .....                               | 8.2                  | 8.3                | 7.8                | 9.0                | 8.7                | 7.7                | 7.5                | 5.7                  | 6.0                | 11.7                    | 11.3               | 9.31            |
| Single-Family Attached .....               | 5.9                  | 5.8                | 6.2                | 6.1                | 6.7                | 5.8                | 6.2                | 5.9                  | 6.4                | Q                       | Q                  | 19.71           |
| Owned .....                                | 4.3                  | 4.4                | 4.7                | 4.8                | 5.3                | 4.0                | 4.5                | 5.1                  | 5.5                | Q                       | Q                  | 21.81           |
| Rented .....                               | 1.6                  | 1.3                | 1.5                | 1.3                | 1.3                | 1.8                | 1.7                | .8                   | .9                 | Q                       | Q                  | 30.10           |
| Building of 2 to 4 Units .....             | 11.1                 | 10.3               | 9.3                | 12.6               | 13.2               | 7.1                | 7.9                | 10.8                 | 11.0               | Q                       | Q                  | 10.05           |
| Owned .....                                | 2.2                  | 2.6                | 2.4                | 3.1                | 3.3                | 1.5                | 1.9                | 3.9                  | 4.0                | Q                       | Q                  | 18.98           |
| Rented .....                               | 8.9                  | 7.7                | 7.0                | 9.5                | 9.9                | 5.6                | 6.0                | 6.9                  | 7.0                | Q                       | Q                  | 11.15           |
| Building of 5 or More Units .....          | 16.5                 | 10.5               | 10.4               | 10.5               | 10.8               | 10.0               | 10.6               | 14.1                 | 11.2               | Q                       | Q                  | 12.23           |
| Owned .....                                | 1.1                  | .7                 | .8                 | .6                 | .7                 | .8                 | 1.0                | Q                    | Q                  | NC                      | NC                 | 47.15           |
| Rented .....                               | 15.4                 | 9.8                | 9.5                | 9.9                | 10.1               | 9.2                | 9.6                | 13.1                 | 10.5               | Q                       | Q                  | 12.54           |
| Mobile Home .....                          | 5.6                  | 4.3                | 5.0                | 2.5                | 2.4                | 5.7                | 5.3                | 4.1                  | 4.5                | 19.7                    | 21.8               | 15.02           |
| Owned .....                                | 4.7                  | 3.6                | 4.2                | 2.2                | 2.1                | 4.9                | 4.6                | 2.9                  | 3.3                | 16.3                    | 17.8               | 16.70           |
| Rented .....                               | 1.0                  | .7                 | .8                 | .4                 | .4                 | .8                 | .8                 | 1.1                  | 1.2                | 3.4                     | 4.0                | 25.01           |

See footnotes at end of table.

## MAJOR FUELS CONSUMPTION

**Table 8. Percentage of Consumption Across Household Characteristics by Major Fuels, 1987 (Continued)**  
(Percent)

| Household Characteristics<br>RSE Column Factors | All Major Fuels      |                    | Natural Gas        |                    | Electricity        |                    | Fuel Oil or Kerosene |                    | Liquefied Petroleum Gas |                 |
|---|----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|----------------------|--------------------|-------------------------|-----------------|
|   | Number of Households | Total Btu Consumed   | Total Btu Consumed | Total Btu Consumed      | RSE Row Factors |
| Number of Rooms                                 | 0.7                  | 0.4                | 0.4                | 0.5                | 0.3                | 0.3                | Q                    | Q                  | Q                       | 44.86           |
| 1   | 2.7                  | 1.4                | 1.2                | 1.3                | 1.1                | 1.1                | 2.5                  | 2.0                | 2.8                     | 22.18           |
| 2   | 10.9                 | 6.5                | 6.6                | 6.1                | 6.6                | 6.8                | 8.3                  | 7.2                | 5.0                     | 11.12           |
| 3   | 15.0                 | 15.2               | 14.5               | 14.6               | 15.3               | 15.1               | 13.3                 | 13.1               | 26.0                    | 28.6            |
| 4   | 23.1                 | 22.1               | 22.1               | 22.0               | 22.3               | 22.0               | 20.2                 | 20.7               | 26.5                    | 6.68            |
| 5   | 19.2                 | 21.5               | 21.6               | 22.6               | 21.6               | 21.9               | 18.8                 | 19.2               | 14.9                    | 5.07            |
| 6   | 12.4                 | 15.7               | 15.8               | 15.8               | 15.9               | 15.8               | 16.3                 | 16.5               | 15.1                    | 6.25            |
| 7   | 7                    | 11.5               | 17.5               | 17.1               | 17.2               | 17.1               | 16.9                 | 20.3               | 21.0                    | 11.2            |
| 8 or More                                       | 35.2                 | 31.4               | 36.6               | 36.4               | 27.0               | 27.1               | 46.6                 | 46.2               | 40.0                    | 42.7            |
| Number of Rooms That Can Be Air Conditioned     | 45.1                 | 43.2               | 48.6               | 41.4               | 40.8               | 57.1               | 55.7                 | 19.7               | 41.2                    | 40.5            |
| All   | 18.6                 | 21.6               | 20.0               | 22.0               | 22.8               | 15.9               | 17.3                 | 33.6               | 18.8                    | 16.8            |
| Some  | 36.4                 | 36.4               | 31.4               | 36.6               | 36.4               | 36.4               | 36.4                 | 34.0               | 18.8                    | 5.30            |
| None  |                      |                    |                    |                    |                    |                    |                      |                    |                         | 5.69            |
| Measured Heated Area of Residence (square feet) | 9.3                  | 5.8                | 5.3                | 5.5                | 5.0                | 5.5                | 8.7                  | 7.8                | 8.4                     | 9.89            |
| Fewer than 600                                  | 26.4                 | 20.2               | 20.8               | 20.9               | 19.8               | 20.0               | 17.7                 | 17.1               | 24.2                    | 6.03            |
| 600 to 999                                      | 28.2                 | 26.0               | 27.3               | 24.3               | 30.0               | 29.1               | 21.4                 | 22.0               | 34.6                    | 32.3            |
| 1,000 to 1,599                                  | 12.4                 | 14.0               | 14.3               | 14.3               | 14.5               | 14.5               | 14.4                 | 12.7               | 13.2                    | 4.81            |
| 1,600 to 1,999                                  | 9.3                  | 12.0               | 11.7               | 12.9               | 12.9               | 11.3               | 11.4                 | 11.9               | 11.2                    | 11.3            |
| 2,000 to 2,399                                  | 8.5                  | 12.2               | 11.4               | 13.2               | 13.1               | 10.5               | 10.6                 | 13.8               | 6.5                     | 6.80            |
| 2,400 to 2,999                                  | 5.8                  | 9.7                | 9.3                | 9.1                | 8.9                | 8.9                | 8.9                  | 14.2               | 14.3                    | 12.4            |
| 3,000 or More                                   | 30.7                 | 23.7               | 24.3               | 31.6               | 32.3               | 17.5               | 19.0                 | 41.7               | 21.5                    | 20.3            |
| Year of Construction                            | 23.7                 | 28.3               | 24.3               | 31.6               | 32.3               | 17.5               | 19.0                 | 41.7               | 21.5                    | 6.22            |
| 1939 or Before                                  | 9.1                  | 9.4                | 8.8                | 10.0               | 10.3               | 7.8                | 7.9                  | 10.4               | 10.1                    | 9.70            |
| 1940 to 1949                                    | 14.4                 | 15.7               | 15.0               | 16.3               | 16.0               | 13.8               | 14.1                 | 18.3               | 18.6                    | 14.6            |
| 1950 to 1959                                    | 18.1                 | 17.9               | 17.8               | 19.1               | 19.4               | 18.0               | 17.8                 | 14.5               | 13.9                    | 6.79            |
| 1960 to 1969                                    | 10.6                 | 10.1               | 10.5               | 10.1               | 9.6                | 11.4               | 11.4                 | 5.8                | 6.0                     | 11.8            |
| 1970 to 1974                                    | 11.6                 | 9.9                | 12.1               | 7.0                | 6.4                | 15.9               | 15.1                 | 6.7                | 7.1                     | 11.3            |
| 1975 to 1979                                    | 8.1                  | 5.8                | 7.4                | 4.1                | 4.0                | 10.1               | 9.5                  | 1.8                | 1.9                     | 14.54           |
| 1980 to 1984                                    | 4.3                  | 3.0                | 4.1                | 2.0                | 2.0                | 5.6                | 5.4                  | Q                  | 4.4                     | 4.8             |
| 1985 or After                                   | 30.7                 | 24.6               | 23.7               | 26.6               | 26.8               | 22.4               | 23.0                 | 23.9               | 22.5                    | 19.60           |
| Status of Unit                                  | 64.9                 | 72.3               | 73.4               | 69.9               | 69.5               | 75.0               | 74.4                 | 72.3               | 74.4                    | 84.2            |
| Owned   | 1.7                  | 1.2                | 1.4                | 1.2                | 1.1                | 1.6                | 1.7                  | Q                  | Q                       | NC              |
| Condominium                                     | 63.2                 | 71.1               | 72.0               | 68.7               | 68.4               | 73.4               | 72.8                 | 72.1               | 74.1                    | 37.53           |
| No Condominium                                  | 35.1                 | 27.7               | 26.6               | 30.1               | 30.5               | 25.0               | 25.6                 | 27.7               | 25.6                    | 84.2            |
| Rented  | 2.8                  | 1.9                | 1.7                | 2.1                | 2.2                | 1.6                | 1.5                  | 2.5                | 2.0                     | 1.92            |
| Public Housing                                  | 32.3                 | 25.8               | 24.9               | 27.9               | 28.2               | 23.4               | 24.0                 | 25.2               | 23.6                    | 5.50            |
| No Public Housing                               | 1.5                  | 1.2                | 1.2                | 1.3                | 1.5                | 1.0                | 1.1                  | 1.3                | 1.1                     | 24.85           |
| Rent Subsidy                                    | 30.7                 | 24.6               | 23.7               | 26.6               | 26.8               | 22.4               | 23.0                 | 23.9               | 22.5                    | 15.6            |
| No Rent Subsidy                                 |                      |                    |                    |                    |                    |                    |                      |                    |                         | 15.8            |
| 1987 Family Income                              | 6.8                  | 5.6                | 5.2                | 6.1                | 6.1                | 4.5                | 4.6                  | 4.5                | 4.4                     | 1.88            |
| Less than \$5,000                               | 12.7                 | 11.3               | 10.4               | 11.8               | 11.6               | 9.5                | 9.4                  | 12.7               | 12.4                    | 37.53           |
| \$5,000 to \$9,999                              | 13.9                 | 12.6               | 12.0               | 12.9               | 12.8               | 11.2               | 11.2                 | 12.9               | 19.2                    | 84.2            |
| \$10,000 to \$14,999                            | 10.0                 | 9.1                | 8.9                | 9.2                | 8.7                | 8.6                | 9.3                  | 9.5                | 10.9                    | 15.8            |
| \$15,000 to \$19,999                            | 9.7                  | 9.2                | 9.3                | 8.6                | 8.4                | 9.8                | 9.6                  | 9.7                | 10.9                    | 10.3            |
| \$20,000 to \$24,999                            | 17.9                 | 17.5               | 18.1               | 16.8               | 16.9               | 18.7               | 17.6                 | 17.5               | 16.1                    | 16.6            |
| \$25,000 to \$34,999                            | 14.8                 | 16.4               | 17.2               | 16.0               | 16.1               | 18.4               | 18.3                 | 15.6               | 8.9                     | 6.63            |
| \$35,000 to \$49,999                            | 14.3                 | 18.3               | 19.0               | 18.5               | 18.9               | 19.0               | 19.6                 | 17.8               | 18.0                    | 9.4             |
| \$50,000 or More                                |                      |                    |                    |                    |                    |                    |                      |                    |                         | 7.54            |

See footnotes at end of table.

**Table 8. Percentage of Consumption Across Household Characteristics by Major Fuels, 1987 (Continued)**  
(Percent)

| Household Characteristics                      | All Major Fuels      |                    |                    | Natural Gas        |                    | Electricity        |                    | Fuel Oil or Kerosene |                    | Liquefied Petroleum Gas |                    | RSE Row Factors |
|--|----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|----------------------|--------------------|-------------------------|--------------------|-----------------|
|  | Number of Households | Total Btu Consumed | Total Expenditures | Total Btu Consumed | Total Expenditures | Total Btu Consumed | Total Expenditures | Total Btu Consumed   | Total Expenditures | Total Btu Consumed      | Total Expenditures |                 |
| RSE Column Factors:                            | 0.614                | 0.631              | 0.620              | 0.868              | 0.859              | 0.708              | 0.688              | 1.440                | 1.416              | 2.406                   | 2.332              |                 |
| Below 100 Percent of Poverty Line .....        | 13.0                 | 11.5               | 10.9               | 12.4               | 12.4               | 10.1               | 10.1               | 8.9                  | 8.7                | 20.8                    | 19.8               | 8.83            |
| Below 125 Percent of Poverty Line .....        | 20.1                 | 18.1               | 17.1               | 19.3               | 19.2               | 15.9               | 15.9               | 15.8                 | 15.5               | 29.9                    | 29.9               | 6.88            |
| Assistance for Heating in Winter               |                      |                    |                    |                    |                    |                    |                    |                      |                    |                         |                    |                 |
| Yes .....                                      | 5.3                  | 5.3                | 4.7                | 5.9                | 5.9                | 3.8                | 3.9                | 4.4                  | 4.5                | 12.2                    | 10.5               | 11.85           |
| No .....                                       | 94.7                 | 94.7               | 95.3               | 94.1               | 94.1               | 96.2               | 96.1               | 95.6                 | 95.5               | .87.8                   | 89.5               | 1.42            |
| Assistance for Weatherization of Residence     |                      |                    |                    |                    |                    |                    |                    |                      |                    |                         |                    |                 |
| Yes .....                                      | 1.1                  | 1.1                | 1.0                | 1.2                | 1.2                | .8                 | .8                 | 1.2                  | 1.3                | Q                       | Q                  | 22.45           |
| No .....                                       | 98.9                 | 98.9               | 99.0               | 98.8               | 98.8               | 99.2               | 99.2               | 98.8                 | 98.7               | 98.2                    | 98.3               | 99.99           |
| Household Owns or Has Regular Use of a Vehicle |                      |                    |                    |                    |                    |                    |                    |                      |                    |                         |                    |                 |
| Yes .....                                      | 87.7                 | 88.6               | 90.1               | 87.3               | 86.4               | 93.2               | 92.3               | 82.4                 | 83.9               | 91.9                    | 90.7               | 1.11            |
| No .....                                       | 12.3                 | 11.4               | 9.9                | 12.7               | 13.6               | 6.8                | 7.7                | 17.6                 | 16.1               | 8.1                     | 9.3                | 7.62            |
| Race of Householder                            |                      |                    |                    |                    |                    |                    |                    |                      |                    |                         |                    |                 |
| White .....                                    | 84.6                 | 84.1               | 85.2               | 81.7               | 80.4               | 87.7               | 87.0               | 84.7                 | 85.2               | 88.3                    | 88.3               | 1.75            |
| Black .....                                    | 12.1                 | 13.2               | 12.3               | 15.5               | 16.8               | 10.1               | 10.5               | 12.8                 | 12.5               | 7.3                     | 7.9                | 11.84           |
| Other .....                                    | 3.3                  | 2.7                | 2.6                | 2.9                | 2.8                | 2.2                | 2.4                | 2.5                  | 2.2                | Q                       | 3.7                | 16.44           |
| Householder of Hispanic Descent                |                      |                    |                    |                    |                    |                    |                    |                      |                    |                         |                    |                 |
| Yes .....                                      | 5.5                  | 4.8                | 5.0                | 4.8                | 4.8                | 4.7                | 5.2                | 5.2                  | 4.7                | 3.9                     | 3.3                | 12.63           |
| No .....                                       | 94.5                 | 95.2               | 95.0               | 95.2               | 95.2               | 95.3               | 94.8               | 94.8                 | 95.3               | 96.1                    | 96.7               | .73             |
| Age of Householder                             |                      |                    |                    |                    |                    |                    |                    |                      |                    |                         |                    |                 |
| Under 25 Years .....                           | 7.1                  | 5.5                | 5.5                | 5.7                | 5.7                | 5.8                | 5.7                | 4.0                  | 4.1                | 4.0                     | 5.0                | 13.37           |
| 25 to 34 Years .....                           | 23.8                 | 22.1               | 22.4               | 22.9               | 22.8               | 22.7               | 22.8               | 18.4                 | 18.1               | 19.1                    | 18.7               | 4.77            |
| 35 to 44 Years .....                           | 19.9                 | 20.9               | 21.8               | 19.9               | 19.6               | 23.1               | 23.0               | 20.4                 | 20.6               | 17.7                    | 17.1               | 5.17            |
| 45 to 59 Years .....                           | 20.8                 | 23.3               | 23.8               | 22.9               | 22.9               | 24.6               | 24.4               | 22.0                 | 22.4               | 24.3                    | 24.1               | 4.84            |
| 60 Years and Over .....                        | 28.4                 | 28.2               | 26.5               | 28.6               | 29.1               | 23.8               | 24.1               | 35.3                 | 34.8               | 34.9                    | 35.1               | 4.30            |
| Household Size                                 |                      |                    |                    |                    |                    |                    |                    |                      |                    |                         |                    |                 |
| 1 Person .....                                 | 23.9                 | 18.8               | 17.0               | 20.5               | 20.1               | 15.1               | 15.2               | 20.1                 | 19.6               | 19.9                    | 20.0               | 4.68            |
| 2 Persons .....                                | 33.9                 | 32.3               | 32.7               | 31.2               | 31.1               | 33.3               | 33.1               | 34.6                 | 34.5               | 31.6                    | 31.6               | 4.28            |
| 3 Persons .....                                | 17.0                 | 18.1               | 18.7               | 17.6               | 17.7               | 19.4               | 19.2               | 18.2                 | 18.7               | 15.1                    | 15.4               | 5.31            |
| 4 Persons .....                                | 15.0                 | 18.0               | 18.4               | 17.7               | 17.7               | 19.1               | 19.0               | 16.1                 | 16.0               | 20.5                    | 20.5               | 5.94            |
| 5 Persons .....                                | 6.8                  | 8.3                | 8.6                | 8.5                | 8.8                | 8.6                | 8.8                | 6.8                  | 7.0                | 6.3                     | 6.2                | 9.01            |
| 6 or More Persons .....                        | 3.5                  | 4.5                | 4.6                | 4.4                | 4.6                | 4.4                | 4.6                | 4.3                  | 4.3                | 6.5                     | 6.3                | 14.54           |
| Secondary Heating                              |                      |                    |                    |                    |                    |                    |                    |                      |                    |                         |                    |                 |
| Yes .....                                      | 41.3                 | 43.8               | 45.7               | 39.1               | 38.5               | 50.1               | 48.2               | 44.4                 | 45.4               | 57.4                    | 58.0               | 3.26            |
| Over 33 Percent of Home's Total Heat .....     | 3.5                  | 3.2                | 3.7                | 1.8                | 1.7                | 4.5                | 4.2                | 5.6                  | 5.8                | 4.8                     | 5.3                | 11.95           |
| No .....                                       | 58.7                 | 56.2               | 54.3               | 60.9               | 61.5               | 49.9               | 51.8               | 55.6                 | 54.6               | 42.6                    | 42.0               | 2.84            |

See footnotes at end of table.

**Table 8. Percentage of Consumption Across Household Characteristics by Major Fuels, 1987 (Continued)**  
(Percent)

| Household Characteristics                        | All Major Fuels      |                    |                    | Natural Gas        |                    | Electricity        |                    | Fuel Oil or Kerosene |                    | Liquefied Petroleum Gas |                    | RSE Row Factors |
|--|----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|----------------------|--------------------|-------------------------|--------------------|-----------------|
|  | Number of Households | Total Btu Consumed | Total Expenditures | Total Btu Consumed | Total Expenditures | Total Btu Consumed | Total Expenditures | Total Btu Consumed   | Total Expenditures | Total Btu Consumed      | Total Expenditures |                 |
|  | RSE Column Factors:  | 0.614              | 0.631              | 0.620              | 0.869              | 0.859              | 0.708              | 0.688                | 1.440              | 1.416                   | 2.406              | 2.332           |
| <b>Fuel Combinations</b>                         |                      |                    |                    |                    |                    |                    |                    |                      |                    |                         |                    |                 |
| Use Natural Gas for Main Heat .....              | 55.2                 | 64.6               | 54.9               | 96.2               | 95.0               | 44.1               | 46.5               | 2.4                  | 2.6                | Q                       | Q                  | 7.57            |
| Use Natural Gas to Heat Water and Have A/C ..... | 31.5                 | 38.1               | 33.5               | 55.8               | 55.1               | 27.7               | 29.6               | 1.3                  | 1.3                | Q                       | Q                  | 7.46            |
| and Lack A/C .....                               | 18.0                 | 20.3               | 15.4               | 32.5               | 31.9               | 9.8                | 10.9               | Q                    | Q                  | NC                      | NC                 | 7.86            |
| Use Electricity to Heat Water and Have A/C ..... | 3.7                  | 4.1                | 4.1                | 4.9                | 5.1                | 4.8                | 4.3                | .2                   | .3                 | Q                       | Q                  | 17.33           |
| and Lack A/C .....                               | 1.7                  | 1.9                | 1.6                | 2.6                | 2.6                | 1.7                | 1.5                | Q                    | Q                  | NC                      | NC                 | 16.15           |
| Other .....                                      | 3                    | .3                 | .3                 | .3                 | .4                 | .2                 | .3                 | Q                    | Q                  | Q                       | Q                  | 41.51           |
| Use Electricity for Main Heat .....              | 19.8                 | 10.7               | 19.0               | 1.2                | 1.3                | 32.6               | 29.4               | .9                   | 1.2                | 2.4                     | 3.5                | 12.19           |
| Use Electricity to Heat Water and Have A/C ..... | 13.7                 | 7.8                | 14.6               | .1                 | .2                 | 25.2               | 23.0               | .7                   | .8                 | 1.5                     | 2.1                | 16.16           |
| and Lack A/C .....                               | 3.3                  | 1.5                | 2.5                | Q                  | Q                  | 4.8                | 3.9                | Q                    | .3                 | Q                       | Q                  | 21.98           |
| Other .....                                      | 2.8                  | 1.3                | 1.9                | 1.0                | 1.1                | 2.5                | 2.5                | Q                    | Q                  | Q                       | Q                  | 27.81           |
| Use Fuel Oil for Main Heat .....                 | 12.0                 | 15.7               | 14.3               | 1.5                | 2.5                | 9.8                | 11.2               | 88.0                 | 86.5               | 4.6                     | 7.5                | 7.03            |
| Use Fuel Oil to Heat Water and Have A/C .....    | 2.9                  | 4.1                | 3.7                | .2                 | .5                 | 1.9                | 2.7                | 25.2                 | 24.5               | .1                      | .3                 | 17.47           |
| and Lack A/C .....                               | 2.8                  | 3.6                | 2.8                | .2                 | .5                 | 1.3                | 1.7                | 23.2                 | 22.1               | .2                      | .4                 | 13.74           |
| Use Electricity to Heat Water and Have A/C ..... | 2.2                  | 2.8                | 2.9                | Q                  | Q                  | 2.8                | 2.7                | 14.2                 | 14.2               | Q                       | Q                  | 16.49           |
| and Lack A/C .....                               | 2.3                  | 2.6                | 2.5                | Q                  | Q                  | 2.6                | 2.4                | 13.2                 | 13.1               | Q                       | 1.2                | 17.10           |
| Other .....                                      | 1.8                  | 2.6                | 2.4                | 1.0                | 1.5                | 1.2                | 1.5                | 12.1                 | 12.6               | 2.4                     | 3.2                | 14.45           |
| Use Wood for Main Heat .....                     | 5.6                  | 3.2                | 4.5                | .9                 | 1.0                | 6.4                | 5.8                | 3.4                  | 3.5                | 9.9                     | 11.1               | 15.59           |
| Use LPG for Main Heat .....                      | 4.6                  | 4.2                | 4.9                | NC                 | NC                 | 4.4                | 4.4                | .6                   | .8                 | 80.2                    | 73.7               | 12.22           |
| Use Kerosene for Main Heat .....                 | 1.5                  | 1.2                | 1.4                | Q                  | Q                  | 1.6                | 1.5                | 4.5                  | 5.2                | 1.4                     | 2.2                | 22.97           |
| Use Coal for Main Heat .....                     | 5                    | .2                 | .2                 | Q                  | Q                  | .4                 | .4                 | Q                    | Q                  | Q                       | Q                  | 63.60           |
| No Heating Fuel/Other Fuel .....                 | .9                   | .3                 | .7                 | Q                  | Q                  | .7                 | 1.0                | Q                    | Q                  | .7                      | 1.3                | 25.99           |

NC No cases in sample.

Q Data withheld either because the RSE was greater than 50 percent or fewer than 10 households were sampled.

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

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Forms EIA-457 A, B, C, D, E, F, G of the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).

CONSUMPTION BY HOUSEHOLD FEATURES

**Table 9. Percentage of Consumption Across Major Fuels by Household Characteristics, 1987**  
 (Percent of Total Btu)

| Household Characteristics                  | All Major Fuels     | Natural Gas | Electricity | Fuel Oil or Kerosene | Liquefied Petroleum Gas | RSE Row Factors |
|--|---------------------|-------------|-------------|----------------------|-------------------------|-----------------|
|  | RSE Column Factors: | 0.000       | 0.555       | 0.513                | 1.378                   |                 |
| Total U.S. Households .....                | 100.0               | 52.9        | 30.2        | 13.4                 | 3.5                     | 4.68            |
| <b>Census Region and Division</b>          |                     |             |             |                      |                         |                 |
| Northeast .....                            | 100.0               | 43.6        | 18.7        | 36.9                 | .8                      | 8.42            |
| New England .....                          | 100.0               | 28.4        | 19.0        | 50.9                 | 1.7                     | 9.08            |
| Middle Atlantic .....                      | 100.0               | 47.8        | 18.7        | 33.0                 | .5                      | 10.68           |
| Midwest .....                              | 100.0               | 67.0        | 22.4        | 5.8                  | 4.8                     | 7.70            |
| East North Central .....                   | 100.0               | 67.9        | 21.1        | 6.8                  | 4.2                     | 10.22           |
| West North Central .....                   | 100.0               | 64.6        | 25.7        | 3.3                  | 6.4                     | 8.46            |
| South .....                                | 100.0               | 42.0        | 46.8        | 6.6                  | 4.6                     | 8.94            |
| South Atlantic .....                       | 100.0               | 35.8        | 48.1        | 11.6                 | 4.6                     | 13.51           |
| East South Central .....                   | 100.0               | 37.0        | 52.0        | 4.9                  | 6.2                     | 14.63           |
| West South Central .....                   | 100.0               | 54.6        | 41.7        | Q                    | Q                       | 12.65           |
| West .....                                 | 100.0               | 61.5        | 33.9        | 1.3                  | 3.3                     | 11.16           |
| Mountain .....                             | 100.0               | 68.0        | 26.9        | Q                    | Q                       | 12.45           |
| Pacific .....                              | 100.0               | 58.4        | 37.3        | Q                    | 2.8                     | 7.65            |
| <b>Metropolitan Status</b>                 |                     |             |             |                      |                         |                 |
| Metropolitan .....                         | 100.0               | 56.3        | 28.6        | 13.3                 | 1.8                     | 5.16            |
| Central City .....                         | 100.0               | 63.7        | 24.6        | 11.2                 | .6                      | 6.86            |
| Outside Central City .....                 | 100.0               | 51.1        | 31.4        | 14.7                 | 2.7                     | 6.39            |
| Nonmetropolitan .....                      | 100.0               | 40.0        | 36.3        | 13.9                 | 9.8                     | 10.91           |
| <b>Climate Zone</b>                        |                     |             |             |                      |                         |                 |
| Under 2,000 CDD and--                      |                     |             |             |                      |                         |                 |
| Over 7,000 HDD .....                       | 100.0               | 44.2        | 24.7        | 22.4                 | 8.7                     | 13.21           |
| 5,500 to 7,000 HDD .....                   | 100.0               | 63.9        | 21.0        | 13.4                 | 1.7                     | 7.86            |
| 4,000 to 5,499 HDD .....                   | 100.0               | 46.7        | 28.7        | 21.9                 | 2.7                     | 9.54            |
| Under 4,000 HDD .....                      | 100.0               | 52.7        | 38.0        | 3.9                  | 5.3                     | 10.81           |
| 2,000 CDD or More and --                   |                     |             |             |                      |                         |                 |
| Under 4,000 HDD .....                      | 100.0               | 42.3        | 53.5        | Q                    | 3.4                     | 11.13           |
| <b>Payment Method for Utilities</b>        |                     |             |             |                      |                         |                 |
| All Paid by Household .....                | 100.0               | 51.7        | 32.2        | 12.2                 | 3.9                     | 5.10            |
| Some Paid, Some in Rent .....              | 100.0               | 60.3        | 18.2        | 20.9                 | Q                       | 13.46           |
| All Included in Rent .....                 | 100.0               | 62.6        | 19.1        | 16.5                 | Q                       | 14.28           |
| Other Method .....                         | 100.0               | 52.2        | 23.0        | 23.6                 | Q                       | 17.61           |
| <b>Housing Structure by Status of Unit</b> |                     |             |             |                      |                         |                 |
| Single-Family Detached .....               | 100.0               | 52.2        | 31.2        | 12.6                 | 4.0                     | 5.19            |
| Owned .....                                | 100.0               | 51.5        | 31.6        | 13.1                 | 3.9                     | 5.35            |
| Rented .....                               | 100.0               | 57.7        | 28.1        | 9.3                  | 4.9                     | 9.08            |
| Single-Family Attached .....               | 100.0               | 55.7        | 30.5        | 13.8                 | Q                       | 19.66           |
| Owned .....                                | 100.0               | 56.9        | 27.6        | 15.5                 | Q                       | 22.43           |
| Rented .....                               | 100.0               | 51.8        | 40.2        | 8.1                  | Q                       | 24.51           |
| Building of 2 to 4 Units .....             | 100.0               | 64.9        | 20.9        | 14.1                 | Q                       | 8.72            |
| Owned .....                                | 100.0               | 62.6        | 17.4        | 19.9                 | Q                       | 13.11           |
| Rented .....                               | 100.0               | 65.7        | 22.2        | 12.1                 | Q                       | 10.93           |
| Building of 5 or More Units .....          | 100.0               | 53.1        | 28.8        | 18.0                 | Q                       | 14.67           |
| Owned .....                                | 100.0               | 47.6        | 35.1        | Q                    | NC                      | 39.80           |
| Rented .....                               | 100.0               | 53.5        | 28.3        | 18.0                 | Q                       | 14.68           |
| Mobile Home .....                          | 100.0               | 31.4        | 40.1        | 12.7                 | 15.9                    | 13.36           |
| Owned .....                                | 100.0               | 31.9        | 41.4        | 11.0                 | 15.7                    | 15.12           |
| Rented .....                               | 100.0               | 28.4        | 33.1        | 21.6                 | 16.8                    | 19.63           |
| <b>Number of Rooms</b>                     |                     |             |             |                      |                         |                 |
| 1 .....                                    | 100.0               | 60.8        | 23.5        | Q                    | Q                       | 35.07           |
| 2 .....                                    | 100.0               | 48.3        | 22.2        | 23.2                 | Q                       | 26.88           |
| 3 .....                                    | 100.0               | 49.2        | 31.0        | 17.2                 | 2.7                     | 13.08           |
| 4 .....                                    | 100.0               | 51.2        | 30.8        | 12.0                 | 6.0                     | 7.65            |
| 5 .....                                    | 100.0               | 53.1        | 30.5        | 12.3                 | 4.1                     | 6.40            |
| 6 .....                                    | 100.0               | 55.6        | 30.3        | 11.7                 | 2.4                     | 6.81            |
| 7 .....                                    | 100.0               | 53.1        | 30.4        | 13.9                 | 2.6                     | 7.85            |
| 8 or More .....                            | 100.0               | 52.4        | 29.5        | 15.6                 | 2.6                     | 8.79            |

See footnotes at end of table.

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## CONSUMPTION BY HOUSEHOLD FEATURES

**Table 9. Percentage of Consumption Across Major Fuels by Household Characteristics, 1987 (Continued)**  
 (Percent of Total Btu)

| Household Characteristics<br>RSE Column Factors        | All Major Fuels<br>0.000 | Natural Gas<br>0.555 | Electricity<br>0.513 | Fuel Oil or Kerosene<br>1.378 | Liquefied Petroleum Gas<br>2.546 | RSE Row Factors |
|--|--------------------------|----------------------|----------------------|-------------------------------|----------------------------------|-----------------|
| <b>Number of Rooms That Can Be Air Conditioned</b>     |                          |                      |                      |                               |                                  |                 |
| All .....  | 100.0                    | 50.7                 | 39.9                 | 6.1                           | 3.3                              | 5.77            |
| Some .....   | 100.0                    | 53.9                 | 22.2                 | 20.9                          | 3.0                              | 6.10            |
| None .....   | 100.0                    | 55.1                 | 23.2                 | 17.8                          | 3.9                              | 7.12            |
| <b>Measured Heated Area of Residence (square feet)</b> |                          |                      |                      |                               |                                  |                 |
| Fewer than 600 .....                                   | 100.0                    | 48.8                 | 26.1                 | 20.1                          | 5.0                              | 9.73            |
| 600 to 999 .....                                       | 100.0                    | 54.5                 | 29.6                 | 11.8                          | 4.1                              | 7.08            |
| 1,000 to 1,599 .....                                   | 100.0                    | 49.5                 | 34.8                 | 11.1                          | 4.6                              | 6.70            |
| 1,600 to 1,999 .....                                   | 100.0                    | 54.0                 | 31.1                 | 12.2                          | 2.8                              | 7.75            |
| 2,000 to 2,399 .....                                   | 100.0                    | 57.0                 | 28.3                 | 12.8                          | 1.9                              | 9.11            |
| 2,400 to 2,999 .....                                   | 100.0                    | 57.0                 | 26.0                 | 15.1                          | 1.9                              | 8.52            |
| 3,000 or More .....                                    | 100.0                    | 49.7                 | 27.7                 | 19.6                          | 3.0                              | 11.15           |
| <b>Year of Construction</b>                            |                          |                      |                      |                               |                                  |                 |
| 1939 or Before .....                                   | 100.0                    | 59.0                 | 18.7                 | 19.7                          | 2.6                              | 6.94            |
| 1940 to 1949 .....                                     | 100.0                    | 56.3                 | 25.2                 | 14.9                          | 3.6                              | 9.23            |
| 1950 to 1959 .....                                     | 100.0                    | 54.9                 | 26.5                 | 15.7                          | 4.1                              | 6.59            |
| 1960 to 1969 .....                                     | 100.0                    | 56.4                 | 30.3                 | 10.9                          | 2.4                              | 7.70            |
| 1970 to 1974 .....                                     | 100.0                    | 52.9                 | 34.2                 | 7.8                           | 5.1                              | 10.27           |
| 1975 to 1979 .....                                     | 100.0                    | 37.2                 | 48.4                 | 9.1                           | 5.2                              | 10.49           |
| 1980 to 1984 .....                                     | 100.0                    | 37.6                 | 53.1                 | 4.2                           | 5.0                              | 15.53           |
| 1985 or After .....                                    | 100.0                    | 36.0                 | 56.2                 | Q                             | 5.1                              | 18.53           |
| <b>Status of Unit</b>                                  |                          |                      |                      |                               |                                  |                 |
| Owned .....  | 100.0                    | 51.2                 | 31.3                 | 13.4                          | 4.0                              | 5.26            |
| Condominium .....                                      | 100.0                    | 56.5                 | 40.5                 | Q                             | NC                               | 27.45           |
| Not a Condominium .....                                | 100.0                    | 51.1                 | 31.2                 | 13.6                          | 4.1                              | 5.27            |
| Rented .....   | 100.0                    | 57.4                 | 27.3                 | 13.4                          | 1.9                              | 6.41            |
| Public Housing .....                                   | 100.0                    | 57.8                 | 25.1                 | 17.1                          | Q                                | 25.82           |
| Rent Subsidy .....                                     | 100.0                    | 57.4                 | 27.4                 | 13.1                          | 2.1                              | 6.97            |
| No Rent Subsidy .....                                  | 100.0                    | 58.4                 | 25.0                 | 15.4                          | Q                                | 23.04           |
|  | 100.0                    | 57.3                 | 27.5                 | 13.0                          | 2.1                              | 7.21            |
| <b>1987 Family Income</b>                              |                          |                      |                      |                               |                                  |                 |
| Less than \$5,000 .....                                | 100.0                    | 58.2                 | 24.5                 | 10.8                          | 6.5                              | 12.14           |
| \$5,000 to \$9,999 .....                               | 100.0                    | 55.4                 | 25.3                 | 15.1                          | 4.3                              | 9.02            |
| \$10,000 to \$14,999 .....                             | 100.0                    | 54.0                 | 26.9                 | 13.8                          | 5.3                              | 8.60            |
| \$15,000 to \$19,999 .....                             | 100.0                    | 53.5                 | 28.7                 | 13.7                          | 4.1                              | 8.38            |
| \$20,000 to \$24,999 .....                             | 100.0                    | 49.8                 | 32.3                 | 13.9                          | 4.1                              | 8.07            |
| \$25,000 to \$34,999 .....                             | 100.0                    | 50.7                 | 32.6                 | 13.5                          | 3.2                              | 7.11            |
| \$35,000 to \$49,999 .....                             | 100.0                    | 51.6                 | 33.8                 | 12.7                          | 1.9                              | 8.01            |
| \$50,000 or More .....                                 | 100.0                    | 53.7                 | 31.4                 | 13.1                          | 1.8                              | 8.47            |
| <b>Below 100 Percent of Poverty Line</b>               |                          |                      |                      |                               |                                  |                 |
| 100.0  | 57.0                     | 26.4                 | 10.3                 | 6.2                           | 9.00                             |                 |
| <b>Below 125 Percent of Poverty Line</b>               |                          |                      |                      |                               |                                  |                 |
| 100.0  | 56.2                     | 26.4                 | 11.7                 | 5.7                           | 7.35                             |                 |
| <b>Assistance for Heating in Winter</b>                |                          |                      |                      |                               |                                  |                 |
| Yes .....  | 100.0                    | 59.0                 | 21.7                 | 11.3                          | 8.0                              | 10.09           |
| No .....   | 100.0                    | 52.6                 | 30.7                 | 13.5                          | 3.2                              | 4.72            |
| <b>Assistance for Weatherization of Residence</b>      |                          |                      |                      |                               |                                  |                 |
| Yes .....  | 100.0                    | 58.7                 | 20.9                 | 14.8                          | Q                                | 19.61           |
| No .....   | 100.0                    | 52.9                 | 30.3                 | 13.4                          | 3.4                              | 4.70            |
| <b>Household Owns or Has Regular Use of a Vehicle</b>  |                          |                      |                      |                               |                                  |                 |
| Yes .....  | 100.0                    | 52.2                 | 31.8                 | 12.5                          | 3.6                              | 4.73            |
| No .....   | 100.0                    | 58.9                 | 18.0                 | 20.7                          | 2.4                              | 8.97            |

See footnotes at end of table.

## CONSUMPTION BY HOUSEHOLD FEATURES

**Table 9. Percentage of Consumption Across Major Fuels by Household Characteristics, 1987 (Continued)**  
(Percent of Total Btu)

| Household Characteristics<br>RSE Column Factors: | All Major Fuels | Natural Gas | Electricity | Fuel Oil or Kerosene | Liquefied Petroleum Gas | RSE Row Factors |
|--|-----------------|-------------|-------------|----------------------|-------------------------|-----------------|
|  | 0.000           | 0.556       | 0.513       | 1.378                | 2.546                   |                 |
| <b>Race of Householder</b>                       |                 |             |             |                      |                         |                 |
| White  | 100.0           | 51.4        | 31.5        | 13.5                 | 3.6                     | 5.11            |
| Black  | 100.0           | 62.0        | 23.1        | 13.0                 | 1.9                     | 9.56            |
| Other  | 100.0           | 57.0        | 24.8        | 12.4                 | Q                       | 14.03           |
| <b>Householder of Hispanic Descent</b>           |                 |             |             |                      |                         |                 |
| Yes  | 100.0           | 52.9        | 29.6        | 14.7                 | 2.8                     | 11.36           |
| No   | 100.0           | 52.9        | 30.2        | 13.3                 | 3.5                     | 4.74            |
| <b>Age of Householder</b>                        |                 |             |             |                      |                         |                 |
| Under 25 Years                                   | 100.0           | 55.7        | 31.9        | 9.8                  | 2.6                     | 13.07           |
| 25 to 34 Years                                   | 100.0           | 54.9        | 31.0        | 11.1                 | 3.0                     | 6.14            |
| 35 to 44 Years                                   | 100.0           | 50.5        | 33.5        | 13.1                 | 2.9                     | 7.17            |
| 45 to 59 Years                                   | 100.0           | 51.9        | 31.9        | 12.6                 | 3.6                     | 6.22            |
| 60 Years and Over                                | 100.0           | 53.5        | 25.4        | 16.8                 | 4.3                     | 6.29            |
| <b>Household Size</b>                            |                 |             |             |                      |                         |                 |
| 1 Person   | 100.0           | 57.7        | 24.3        | 14.3                 | 3.7                     | 8.43            |
| 2 Persons  | 100.0           | 51.1        | 31.1        | 14.3                 | 3.4                     | 5.92            |
| 3 Persons  | 100.0           | 51.4        | 32.3        | 13.4                 | 2.9                     | 6.16            |
| 4 Persons  | 100.0           | 52.1        | 32.0        | 12.0                 | 3.9                     | 7.21            |
| 5 Persons  | 100.0           | 54.7        | 31.5        | 11.1                 | 2.6                     | 8.95            |
| 6 or More Persons                                | 100.0           | 52.3        | 29.9        | 12.7                 | 5.0                     | 13.48           |
| <b>Secondary Heating</b>                         |                 |             |             |                      |                         |                 |
| Yes  | 100.0           | 47.3        | 34.6        | 13.6                 | 4.5                     | 5.63            |
| Over 33 Percent of Home's Total Heat             | 100.0           | 29.5        | 42.2        | 23.2                 | 5.1                     | 11.89           |
| No   | 100.0           | 57.3        | 26.8        | 13.3                 | 2.6                     | 5.13            |
| <b>Fuel Combinations</b>                         |                 |             |             |                      |                         |                 |
| Use Natural Gas for Main Heat                    | 100.0           | 78.9        | 20.6        | .5                   | Q                       | 9.42            |
| Use Natural Gas to Heat Water and Have A/C       | 100.0           | 77.6        | 21.9        | .5                   | Q                       | 10.83           |
| and Lack A/C                                     | 100.0           | 84.9        | 14.6        | Q                    | NC                      | 4.20            |
| Use Electricity to Heat Water and Have A/C       | 100.0           | 64.0        | 35.3        | .7                   | Q                       | 10.62           |
| and Lack A/C                                     | 100.0           | 72.7        | 26.9        | Q                    | NC                      | 5.65            |
| Other  | 100.0           | 67.8        | 27.0        | Q                    | Q                       | 16.58           |
| Use Electricity for Main Heat and Have A/C       | 100.0           | 5.7         | 9.23        | 1.2                  | 8                       | 15.89           |
| and Lack A/C                                     | 100.0           | .7          | 97.4        | 1.2                  | 7                       | 23.96           |
| Other  | 100.0           | Q           | 96.6        | Q                    | Q                       | 3.17            |
| Use Fuel Oil for Main Heat and Have A/C          | 100.0           | 41.6        | 57.2        | Q                    | 13.47                   | 5.88            |
| Use Fuel Oil to Heat Water and Have A/C          | 100.0           | 4.9         | 18.9        | 75.2                 | 1.0                     | 5.88            |
| Use Electricity to Heat Water and Have A/C       | 100.0           | 3.2         | 14.2        | 82.5                 | .1                      | 7.79            |
| Other  | 100.0           | 2.9         | 10.5        | 86.3                 | 2                       | 16.74           |
| Use LPG for Main Heat and Lack A/C               | 100.0           | Q           | 30.3        | 67.6                 | Q                       | 4.97            |
| Other  | 100.0           | 20.1        | 30.4        | 68.6                 | .9                      | 6.25            |
| Use Wood for Main Heat and Lack A/C              | 100.0           | 15.5        | 13.9        | 62.8                 | 3.2                     | 6.34            |
| Use Kerosene for Main Heat and Lack A/C          | 100.0           | NC          | 59.9        | 14.0                 | 10.6                    | 13.80           |
| Use Coal for Main Heat and Lack A/C              | 100.0           | Q           | 32.0        | 1.9                  | 66.1                    | 6.55            |
| No Heating Fuel/Other Fuel                       | 100.0           | 21.2        | 78.7        | 51.0                 | 4.2                     | 8.03            |
| NC   |                 |             |             |                      |                         |                 |
| Q  |                 |             |             |                      |                         |                 |

NC No cases in sample.

Q Data withheld either because the RSE was greater than 50 percent or fewer than 10 households were sampled.

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

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End User Division, Forms EIA-457 A, B, C, D, E, F, G or the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).

## EXPENDITURES BY HOUSEHOLD FEATURES

**Table 10. Percentage of Energy Expenditures Across Major Fuels by Household Characteristics, 1987**  
 (Percent of Total Dollars)

| Household Characteristics                  | All Major Fuels | Natural Gas | Electricity | Fuel Oil or Kerosene | Liquefied Petroleum Gas | RSE Row Factors |
|--|-----------------|-------------|-------------|----------------------|-------------------------|-----------------|
| RSE Column Factors                         | 0.000           | 0.787       | 0.295       | 1.537                | 2.767                   |                 |
| Total U.S. Households                      | 100.0           | 26.8        | 63.0        | 7.4                  | 2.9                     | 4.09            |
| <b>Census Region and Division</b>          |                 |             |             |                      |                         |                 |
| Northeast                                  | 100.0           | 27.4        | 50.8        | 20.8                 | 1.0                     | 6.72            |
| New England                                | 100.0           | 19.0        | 49.1        | 29.8                 | 2.0                     | 8.15            |
| Middle Atlantic                            | 100.0           | 29.7        | 51.2        | 18.4                 | .7                      | 8.50            |
| Midwest                                    | 100.0           | 36.0        | 56.3        | 3.8                  | 4.0                     | 7.15            |
| East North Central                         | 100.0           | 37.1        | 54.7        | 4.4                  | 3.8                     | 9.11            |
| West North Central                         | 100.0           | 32.9        | 60.5        | 2.1                  | 4.5                     | 8.54            |
| South                                      | 100.0           | 18.1        | 75.2        | 3.2                  | 3.4                     | 7.76            |
| South Atlantic                             | 100.0           | 16.7        | 74.5        | 5.2                  | 3.7                     | 11.66           |
| East South Central                         | 100.0           | 15.4        | 77.1        | 2.7                  | 4.8                     | 12.29           |
| West South Central                         | 100.0           | 22.3        | 75.5        | Q                    | Q                       | 7.89            |
| West                                       | 100.0           | 29.5        | 66.9        | .7                   | 2.9                     | 9.80            |
| Mountain                                   | 100.0           | 33.9        | 62.6        | Q                    | Q                       | 8.50            |
| Pacific                                    | 100.0           | 27.8        | 68.5        | .8                   | 2.9                     | 11.86           |
| <b>Metropolitan Status</b>                 |                 |             |             |                      |                         |                 |
| Metropolitan                               | 100.0           | 29.0        | 62.0        | 7.3                  | 1.6                     | 4.49            |
| Central City                               | 100.0           | 35.3        | 57.8        | 6.3                  | .7                      | 5.75            |
| Outside Central City                       | 100.0           | 25.1        | 64.7        | 7.9                  | 2.3                     | 5.69            |
| Nonmetropolitan                            | 100.0           | 18.4        | 66.6        | 7.6                  | 7.4                     | 9.16            |
| <b>Climate Zone</b>                        |                 |             |             |                      |                         |                 |
| Under 2,000 CDD and Over 7,000 HDD         | 100.0           | 23.8        | 54.7        | 14.0                 | 7.5                     | 12.08           |
| 5,500 to 7,000 HDD                         | 100.0           | 35.3        | 54.3        | 8.7                  | 1.6                     | 6.47            |
| 4,000 to 5,499 HDD                         | 100.0           | 26.6        | 59.6        | 11.8                 | 2.1                     | 8.22            |
| Under 4,000 HDD                            | 100.0           | 24.7        | 69.0        | 2.1                  | 4.2                     | 9.35            |
| 2,000 CDD or More and Under 4,000 HDD      | 100.0           | 15.8        | 81.2        | Q                    | 2.5                     | 8.40            |
| <b>Payment Method for Utilities</b>        |                 |             |             |                      |                         |                 |
| All Paid by Household                      | 100.0           | 25.3        | 64.7        | 6.8                  | 3.2                     | 4.46            |
| Some Paid, Some in Rent                    | 100.0           | 36.5        | 51.9        | 11.0                 | .6                      | 10.98           |
| All Included in Rent                       | 100.0           | 39.5        | 49.3        | 9.4                  | Q                       | 12.89           |
| Other Method                               | 100.0           | 28.9        | 55.9        | 14.0                 | Q                       | 17.16           |
| <b>Housing Structure by Status of Unit</b> |                 |             |             |                      |                         |                 |
| Single-Family Detached                     | 100.0           | 25.9        | 63.8        | 7.1                  | 3.2                     | 4.60            |
| Owned                                      | 100.0           | 25.4        | 64.2        | 7.3                  | 3.1                     | 4.76            |
| Rented                                     | 100.0           | 29.9        | 60.3        | 5.7                  | 4.2                     | 8.18            |
| Single-Family Attached                     | 100.0           | 29.0        | 63.3        | 7.7                  | Q                       | 17.63           |
| Owned                                      | 100.0           | 30.7        | 60.5        | 8.7                  | Q                       | 19.67           |
| Rented                                     | 100.0           | 23.8        | 71.9        | 4.4                  | Q                       | 21.63           |
| Building of 2 to 4 Units                   | 100.0           | 37.9        | 53.3        | 8.7                  | Q                       | 7.89            |
| Owned                                      | 100.0           | 37.5        | 49.8        | 12.6                 | Q                       | 11.98           |
| Rented                                     | 100.0           | 38.0        | 54.5        | 7.4                  | Q                       | 9.57            |
| Building of 5 or More Units                | 100.0           | 27.8        | 64.1        | 8.0                  | Q                       | 12.19           |
| Owned                                      | 100.0           | 20.8        | 72.6        | Q                    | NC                      | 28.82           |
| Rented                                     | 100.0           | 28.4        | 63.3        | 8.1                  | Q                       | 12.28           |
| Mobile Home                                | 100.0           | 13.1        | 67.6        | 6.7                  | 12.6                    | 10.76           |
| Owned                                      | 100.0           | 13.2        | 68.8        | 5.8                  | 12.2                    | 11.97           |
| Rented                                     | 100.0           | 12.8        | 61.3        | 11.3                 | 14.6                    | 16.93           |
| <b>Number of Rooms</b>                     |                 |             |             |                      |                         |                 |
| 1  | 100.0           | 33.2        | 57.6        | Q                    | Q                       | 30.28           |
| 2  | 100.0           | 26.0        | 55.9        | 11.7                 | 6.3                     | 20.67           |
| 3  | 100.0           | 24.7        | 64.9        | 8.0                  | 2.4                     | 11.66           |
| 4  | 100.0           | 25.7        | 62.6        | 6.4                  | 5.4                     | 6.73            |
| 5  | 100.0           | 26.7        | 63.1        | 6.9                  | 3.3                     | 5.43            |
| 6  | 100.0           | 27.8        | 63.6        | 6.5                  | 2.0                     | 5.98            |
| 7  | 100.0           | 27.0        | 63.3        | 7.7                  | 2.0                     | 7.13            |
| 8 or More                                  | 100.0           | 26.9        | 62.2        | 9.1                  | 1.9                     | 7.80            |

See footnotes at end of table.

## EXPENDITURES BY HOUSEHOLD FEATURES

**Table 10. Percentage of Energy Expenditures Across Major Fuels by Household Characteristics, 1987 (Continued)**  
 (Percent of Total Dollars)

| Household Characteristics<br>RSE Column Factors:       | All Major Fuels | Natural Gas | Electricity | Fuel Oil or Kerosene | Liquefied Petroleum Gas | RSE Row Factors |
|--|-----------------|-------------|-------------|----------------------|-------------------------|-----------------|
|  | 0.000           | 0.797       | 0.295       | 1.537                | 2.767                   |                 |
| <b>Number of Rooms That Can Be Air Conditioned</b>     |                 |             |             |                      |                         |                 |
| All .....  | 100.0           | 22.4        | 72.2        | 3.0                  | 2.4                     | 5.18            |
| Some .....   | 100.0           | 30.6        | 54.4        | 12.6                 | 2.4                     | 5.15            |
| None .....   | 100.0           | 31.0        | 54.3        | 10.8                 | 3.9                     | 6.14            |
| <b>Measured Heated Area of Residence (square feet)</b> |                 |             |             |                      |                         |                 |
| Fewer than 600 .....                                   | 100.0           | 25.5        | 59.8        | 9.9                  | 4.8                     | 8.41            |
| 600 to 999 .....                                       | 100.0           | 27.6        | 62.4        | 6.2                  | 3.7                     | 6.19            |
| 1,000 to 1,599 .....                                   | 100.0           | 23.7        | 67.0        | 5.9                  | 3.4                     | 6.00            |
| 1,600 to 1,999 .....                                   | 100.0           | 27.1        | 63.8        | 6.8                  | 2.3                     | 6.87            |
| 2,000 to 2,399 .....                                   | 100.0           | 29.5        | 61.2        | 7.5                  | 1.8                     | 8.25            |
| 2,400 to 2,989 .....                                   | 100.0           | 30.7        | 58.8        | 8.9                  | 1.6                     | 7.61            |
| 3,000 or More .....                                    | 100.0           | 25.8        | 60.8        | 11.4                 | 2.1                     | 10.01           |
| <b>Year of Construction</b>                            |                 |             |             |                      |                         |                 |
| 1939 or Before .....                                   | 100.0           | 35.5        | 49.4        | 12.7                 | 2.4                     | 5.83            |
| 1940 to 1949 .....                                     | 100.0           | 31.3        | 56.7        | 8.5                  | 3.5                     | 8.22            |
| 1950 to 1959 .....                                     | 100.0           | 28.6        | 59.5        | 9.2                  | 2.8                     | 5.94            |
| 1960 to 1969 .....                                     | 100.0           | 29.2        | 63.2        | 5.8                  | 1.9                     | 6.71            |
| 1970 to 1974 .....                                     | 100.0           | 24.6        | 66.8        | 4.2                  | 4.4                     | 8.94            |
| 1975 to 1979 .....                                     | 100.0           | 14.2        | 78.2        | 4.3                  | 3.3                     | 8.83            |
| 1980 to 1984 .....                                     | 100.0           | 14.5        | 80.6        | 1.9                  | 3.0                     | 12.18           |
| 1985 or After .....                                    | 100.0           | 12.8        | 82.8        | Q                    | 3.3                     | 15.51           |
| <b>Status of Unit</b>                                  |                 |             |             |                      |                         |                 |
| Owned .....  | 100.0           | 25.3        | 63.9        | 7.5                  | 3.3                     | 4.67            |
| Condominium .....                                      | 100.0           | 22.2        | 76.4        | Q                    | 20.73                   | 4.68            |
| Not a Condominium .....                                | 100.0           | 25.4        | 63.6        | 7.6                  | 3.4                     | 4.68            |
| Rented .....   | 100.0           | 30.6        | 60.6        | 7.1                  | 1.7                     | 5.41            |
| Public Housing .....                                   | 100.0           | 35.0        | 56.3        | 8.7                  | Q                       | 21.66           |
| Not Public Housing .....                               | 100.0           | 30.3        | 60.8        | 7.0                  | 1.8                     | 5.70            |
| Rent Subsidy .....                                     | 100.0           | 34.2        | 57.7        | 7.1                  | Q                       | 24.04           |
| No Rent Subsidy .....                                  | 100.0           | 30.2        | 61.0        | 7.0                  | 1.9                     | 5.79            |
| <b>1987 Family Income</b>                              |                 |             |             |                      |                         |                 |
| Less than \$5,000 .....                                | 100.0           | 31.7        | 55.8        | 6.3                  | 6.2                     | 10.69           |
| \$5,000 to \$9,999 .....                               | 100.0           | 30.1        | 57.0        | 8.8                  | 4.1                     | 8.28            |
| \$10,000 to \$14,999 .....                             | 100.0           | 28.5        | 59.1        | 8.0                  | 4.4                     | 7.18            |
| \$15,000 to \$19,999 .....                             | 100.0           | 27.6        | 60.9        | 7.9                  | 3.6                     | 8.16            |
| \$20,000 to \$24,999 .....                             | 100.0           | 24.1        | 65.0        | 7.7                  | 3.2                     | 6.97            |
| \$25,000 to \$34,999 .....                             | 100.0           | 25.0        | 65.2        | 7.1                  | 2.6                     | 6.28            |
| \$35,000 to \$49,999 .....                             | 100.0           | 25.0        | 66.9        | 6.7                  | 1.4                     | 7.25            |
| \$50,000 or More .....                                 | 100.0           | 26.6        | 65.0        | 7.0                  | 1.4                     | 7.53            |
| <b>Below 100 Percent of Poverty Line</b>               |                 |             |             |                      |                         |                 |
| Below 125 Percent of Poverty Line .....                | 100.0           | 30.6        | 58.3        | 5.9                  | 5.2                     | 7.74            |
| <b>Assistance for Heating in Winter</b>                |                 |             |             |                      |                         |                 |
| Yes .....  | 100.0           | 30.0        | 58.3        | 6.7                  | 5.0                     | 6.47            |
| No .....   | 100.0           | 26.4        | 63.5        | 7.4                  | 2.7                     | 4.11            |
| <b>Assistance for Weatherization of Residence</b>      |                 |             |             |                      |                         |                 |
| Yes .....  | 100.0           | 33.8        | 52.6        | 7.1                  | 6.5                     | 8.84            |
| No .....   | 100.0           | 26.7        | 63.1        | 7.4                  | 2.9                     | 4.10            |
| <b>Household Owns or Has Regular Use of a Vehicle</b>  |                 |             |             |                      |                         |                 |
| Yes .....  | 100.0           | 34.0        | 51.1        | 9.8                  | Q                       | 16.32           |
| No .....   | 100.0           | 26.7        | 63.1        | 7.4                  | 2.9                     | 4.10            |
|  |                 |             |             |                      |                         | 8.13            |

See footnotes at end of table.

**Table 10. Percentage of Energy Expenditures Across Major Fuels by Household Characteristics, 1987 (Continued)**  
 (Percent of Total Dollars)

| Household Characteristics                        | All Major Fuels | Natural Gas | Electricity | Fuel Oil or Kerosene | Liquefied Petroleum Gas | RSE Row Factors |
|--|-----------------|-------------|-------------|----------------------|-------------------------|-----------------|
| RSE Column Factors                               | 0.000           | 0.797       | 0.295       | 1.537                | 2.767                   |                 |
| <b>Race of Householder</b>                       |                 |             |             |                      |                         |                 |
| White .....                                      | 100.0           | 25.3        | 64.4        | 7.4                  | 3.0                     | 4.44            |
| Black .....                                      | 100.0           | 36.6        | 54.0        | 7.5                  | 1.9                     | 8.84            |
| Other .....                                      | 100.0           | 29.4        | 60.0        | 6.4                  | 4.2                     | 13.71           |
| <b>Householder of Hispanic Descent</b>           |                 |             |             |                      |                         |                 |
| Yes .....  | 100.0           | 25.8        | 65.3        | 7.0                  | 1.9                     | 10.45           |
| No .....   | 100.0           | 26.8        | 62.9        | 7.4                  | 2.9                     | 4.15            |
| <b>Age of Householder</b>                        |                 |             |             |                      |                         |                 |
| Under 25 Years .....                             | 100.0           | 27.4        | 64.6        | 5.4                  | 2.6                     | 12.13           |
| 25 to 34 Years .....                             | 100.0           | 27.3        | 64.3        | 6.0                  | 2.4                     | 5.25            |
| 35 to 44 Years .....                             | 100.0           | 24.1        | 66.7        | 7.0                  | 2.3                     | 6.01            |
| 45 to 59 Years .....                             | 100.0           | 25.7        | 64.5        | 6.9                  | 2.9                     | 5.48            |
| 60 Years and Over .....                          | 100.0           | 29.3        | 57.2        | 9.7                  | 3.8                     | 5.87            |
| <b>Household Size</b>                            |                 |             |             |                      |                         |                 |
| 1 person .....                                   | 100.0           | 31.7        | 56.5        | 8.5                  | 3.4                     | 7.43            |
| 2 Persons .....                                  | 100.0           | 25.5        | 63.9        | 7.8                  | 2.8                     | 5.22            |
| 3 Persons .....                                  | 100.0           | 25.4        | 64.9        | 7.4                  | 2.4                     | 5.52            |
| 4 Persons .....                                  | 100.0           | 25.7        | 64.8        | 6.4                  | 3.2                     | 5.98            |
| 5 Persons .....                                  | 100.0           | 27.3        | 64.6        | 6.0                  | 2.1                     | 8.09            |
| 6 or More Persons .....                          | 100.0           | 26.2        | 63.0        | 6.9                  | 3.9                     | 11.26           |
| <b>Secondary Heating</b>                         |                 |             |             |                      |                         |                 |
| Yes .....  | 100.0           | 22.6        | 66.5        | 7.3                  | 3.6                     | 5.09            |
| Over 33 Percent of Home's Total Heat .....       | 100.0           | 12.6        | 71.7        | 11.6                 | 4.1                     | 10.23           |
| No .....   | 100.0           | 30.3        | 60.1        | 7.4                  | 2.2                     | 4.30            |
| <b>Fuel Combinations</b>                         |                 |             |             |                      |                         |                 |
| Use Natural Gas for Main Heat .....              | 100.0           | 46.3        | 53.3        | .4                   | Q                       | 4.79            |
| Use Natural Gas to Heat Water and Have A/C ..... | 100.0           | 44.0        | 55.7        | .3                   | Q                       | 5.69            |
| and Lack A/C .....                               | 100.0           | 55.3        | 44.3        | Q                    | NC                      | 2.68            |
| Use Electricity to Heat Water and Have A/C ..... | 100.0           | 33.3        | 66.2        | .5                   | Q                       | 9.53            |
| and Lack A/C .....                               | 100.0           | 42.5        | 57.1        | Q                    | NC                      | 7.94            |
| Other .....                                      | 100.0           | 35.1        | 61.1        | Q                    | Q                       | 17.88           |
| Use Electricity for Main Heat .....              | 100.0           | 1.8         | 97.2        | .5                   | .5                      | 12.21           |
| Use Electricity to Heat Water and Have A/C ..... | 100.0           | .3          | 98.8        | .4                   | .4                      | 19.04           |
| and Lack A/C .....                               | 100.0           | Q           | 98.1        | .9                   | Q                       | 31.90           |
| Other .....                                      | 100.0           | 15.3        | 83.8        | Q                    | Q                       | 9.58            |
| Use Fuel Oil for Main Heat .....                 | 100.0           | 4.7         | 49.2        | 44.6                 | 1.5                     | 5.55            |
| Use Fuel Oil to Heat Water and Have A/C .....    | 100.0           | 3.7         | 47.0        | 49.1                 | .2                      | 6.12            |
| and Lack A/C .....                               | 100.0           | 4.5         | 37.8        | 57.3                 | .4                      | 8.40            |
| Use Electricity to Heat Water and Have A/C ..... | 100.0           | Q           | 60.5        | 36.8                 | Q                       | 6.56            |
| and Lack A/C .....                               | 100.0           | Q           | 60.6        | 37.9                 | 1.3                     | 9.15            |
| Other .....                                      | 100.0           | 16.6        | 40.6        | 38.9                 | 3.9                     | 6.13            |
| Use Wood for Main Heat .....                     | 100.0           | 5.7         | 81.5        | 5.7                  | 7.1                     | 11.56           |
| Use LPG for Main Heat .....                      | 100.0           | NC          | 55.9        | 1.1                  | 43.0                    | 7.71            |
| Use Kerosene for Main Heat .....                 | 100.0           | Q           | 65.8        | 27.4                 | 4.4                     | 8.64            |
| Use Coal for Main Heat .....                     | 100.0           | Q           | 90.2        | Q                    | Q                       | 17.10           |
| No Heating Fuel/Other Fuel .....                 | 100.0           | Q           | 88.4        | Q                    | 5.3                     | 12.03           |

NC No cases in sample.

Q Data withheld either because the RSE was greater than 50 percent or fewer than 10 households were sampled.

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

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Forms EIA-457 A, B, C, D, E, F, G of the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).

**Table 11. Consumption of All Major Fuels and Consumption of Electricity per Household by Main Heating Fuel, 1987**  
 (Million Btu per Household)

|                                     |                     | Consumption of Natural Gas, Electricity, Fuel Oil or Kerosene, LPG |                          |                                  |                          | Consumption of Electricity       |                          |                   |             |      |      |      |       |
|-------------------------------------|---------------------|--|--------------------------|----------------------------------|--------------------------|----------------------------------|--------------------------|-------------------|-------------|------|------|------|-------|
|                                     |                     | In Households Where:   |                          | In Households Where:             |                          | In Households Where:             |                          |                   |             |      |      |      |       |
| Household Characteristics           | RSE Column Factors: | Main Heating Fuel is Electricity                                   | Main Heating Fuel is Gas | Main Heating Fuel is Electricity | Main Heating Fuel is Gas | Main Heating Fuel is Electricity | Main Heating Fuel is Gas |                   |             |      |      |      |       |
|                                     |                     | In All Households  | Natural Gas              | With Air Conditioning            | Without Air Conditioning | With Oil or Kerosene             | Petroleum Gas            | In All Households | Natural Gas |      |      |      |       |
| Total U.S. Households .....         | 100.8               | 117.9  | 56.4                     | 45.7                             | 126.4                    | 92.5                             | 30.5                     | 24.3              | 52.5        | 40.2 | 25.7 | 29.6 | 2.78  |
| <b>Census Region and Division</b>   |                     |  |                          |                                  |                          |                                  |                          |                   |             |      |      |      |       |
| Northeast .....                     | 124.4               | 138.8  | 53.1                     | 54.4                             | 134.9                    | Q                                | 23.3                     | 18.8              | 49.1        | 51.2 | 20.4 | Q    | 5.59  |
| New England .....                   | 121.0               | 130.2  | 49.9                     | 48.4                             | 135.9                    | Q                                | 22.9                     | 16.9              | 47.6        | 42.2 | 21.9 | Q    | 8.71  |
| Middle Atlantic .....               | 125.4               | 140.3  | 53.6                     | 58.4                             | 134.5                    | Q                                | 23.4                     | 19.2              | 49.4        | 57.2 | 19.7 | Q    | 6.64  |
| Midwest .....                       | 122.5               | 132.1  | 68.6                     | 75.1                             | 122.6                    | 115.2                            | 27.4                     | 22.5              | 64.9        | 63.5 | 36.0 | 29.9 | 5.53  |
| East North Central .....            | 125.3               | 134.5  | 68.3                     | 76.6                             | 126.4                    | 117.3                            | 26.4                     | 20.9              | 65.2        | 65.9 | 37.2 | 31.3 | 7.16  |
| West North Central .....            | 115.8               | 126.1  | 69.2                     | Q                                | 108.0                    | 111.3                            | 29.8                     | 26.5              | 64.3        | Q    | 31.4 | 27.4 | 6.53  |
| South .....                         | 84.3                | 111.0  | 56.6                     | 39.1                             | 103.9                    | 78.4                             | 39.5                     | 32.6              | 53.4        | 35.8 | 35.4 | 31.1 | 4.41  |
| South Atlantic .....                | 81.0                | 113.9  | 55.6                     | 33.6                             | 103.2                    | 72.7                             | 38.9                     | 29.7              | 53.8        | 29.7 | 33.7 | 30.1 | 6.54  |
| East South Central .....            | 84.1                | 112.0  | 62.9                     | 47.0                             | 106.0                    | 87.8                             | 43.7                     | 33.7              | 60.6        | 46.1 | 45.2 | 35.2 | 6.63  |
| West South Central .....            | 90.1                | 108.0  | 53.7                     | Q                                | 80.4                     | 37.5                             | 34.7                     | 34.7              | 46.7        | Q    | 29.0 | 22.7 | 6.99  |
| West .....                          | 77.8                | 91.5   | 51.1                     | 41.0                             | 92.3                     | 93.3                             | 26.4                     | 21.1              | 43.6        | 35.3 | 39.6 | 22.7 | 9.84  |
| Mountain .....                      | 103.5               | 116.1  | 54.0                     | 54.2                             | Q                        | 124.2                            | 27.8                     | 22.5              | 50.4        | 42.7 | Q    | 28.8 | 9.66  |
| Pacific .....                       | 69.6                | 82.2   | 49.7                     | 40.1                             | 89.4                     | 78.2                             | 26.0                     | 20.6              | 40.4        | 34.8 | 40.6 | 19.3 | 8.72  |
| <b>Metropolitan Status</b>          |                     |  |                          |                                  |                          |                                  |                          |                   |             |      |      |      |       |
| Metropolitan .....                  | 102.9               | 118.1  | 54.3                     | 43.3                             | 130.0                    | 82.4                             | 29.4                     | 24.0              | 50.0        | 37.7 | 23.7 | 27.9 | 3.41  |
| Central City .....                  | 101.2               | 115.9  | 49.4                     | 39.9                             | 115.3                    | 63.6                             | 24.9                     | 21.2              | 45.5        | 28.9 | 17.5 | 24.7 | 5.62  |
| Outside Central City .....          | 104.1               | 120.0  | 57.4                     | 45.6                             | 139.4                    | 86.5                             | 32.7                     | 26.5              | 53.1        | 42.8 | 27.7 | 28.6 | 4.15  |
| Nonmetropolitan .....               | 93.7                | 116.9  | 66.1                     | 53.1                             | 114.4                    | 100.5                            | 34.0                     | 25.8              | 64.0        | 48.2 | 32.2 | 30.9 | 4.66  |
| <b>Climate Zone</b>                 |                     |  |                          |                                  |                          |                                  |                          |                   |             |      |      |      |       |
| Under 2,000 CDD and--               | 110.4               | 126.8  | 62.4                     | 57.1                             | 121.5                    | 112.9                            | 27.2                     | 22.1              | 61.8        | 46.6 | 27.9 | 25.6 | 6.85  |
| Over 7,000 HDD .....                | 126.0               | 136.6  | 66.4                     | 54.5                             | 145.7                    | 114.3                            | 26.5                     | 20.7              | 63.5        | 51.9 | 26.9 | 32.3 | 5.47  |
| 5,500 to 7,000 HDD .....            | 106.7               | 127.6  | 60.4                     | 43.8                             | 123.3                    | 100.4                            | 30.6                     | 24.9              | 57.3        | 42.4 | 22.0 | 30.4 | 5.09  |
| 4,000 to 5,499 HDD .....            | 77.4                | 87.7   | 54.4                     | 36.7                             | 93.6                     | 93.4                             | 29.4                     | 22.9              | 48.3        | 23.3 | 33.6 | 32.7 | 5.19  |
| Under 4,000 HDD .....               | 73.7                | 98.6   | 52.6                     | 27.3                             | 68.9                     | 60.5                             | 39.5                     | 35.2              | 49.2        | 22.3 | 37.6 | 27.5 | 6.97  |
| <b>Payment Method for Utilities</b> |                     |  |                          |                                  |                          |                                  |                          |                   |             |      |      |      |       |
| All Paid by Household .....         | 105.2               | 124.9  | 59.5                     | 50.2                             | 134.4                    | 94.0                             | 33.8                     | 27.1              | 56.7        | 46.1 | 30.7 | 30.3 | 2.98  |
| Some Paid, Some in Rent .....       | 78.2                | 84.1   | 37.1                     | 29.2                             | 102.5                    | Q                                | 14.3                     | 12.4              | 26.1        | 19.3 | 10.0 | Q    | 8.24  |
| All Included in Rent .....          | 85.0                | 97.7   | 39.3                     | 35.4                             | 93.5                     | Q                                | 16.2                     | 14.6              | 30.4        | 29.9 | 8.9  | Q    | 11.45 |
| Other Method .....                  | 90.3                | 105.0  | 43.0                     | Q                                | 123.6                    | Q                                | 20.8                     | 15.8              | 38.5        | Q    | 20.5 | Q    | 14.94 |

See footnotes at end of table.

# AVERAGE CONSUMPTION BY HEATING FUEL

**Table 11. Consumption of All Major Fuels and Consumption of Electricity per Household by Main Heating Fuel, 1987 (Continued)**  
 (Million Btu per Household)

| Household Characteristics                              | Consumption of Natural Gas, Electricity, Fuel Oil or Kerosene, LPG |   |                                  |   | Consumption of Electricity       |   |                                  |   | RSE<br>Row<br>Factors |       |       |       |
|--|--|---|----------------------------------|---|----------------------------------|---|----------------------------------|---|-----------------------|-------|-------|-------|
|  | In Households Where:   |   |                                  |   | In Households Where:             |   |                                  |   |                       |       |       |       |
|  | Main Heating Fuel Is Electricity                                   | Main Heating Fuel With Air Conditioning | Main Heating Fuel Is Natural Gas | Main Heating Fuel Is Fuel Oil or Kerosene | Main Heating Fuel Is Electricity | Main Heating Fuel With Air Conditioning | Main Heating Fuel Is Natural Gas | Main Heating Fuel Is Fuel Oil or Kerosene |                       |       |       |       |
| In All Households                                      | 0.475  | 0.497                                   | 1.043                            | 1.866                                     | 0.452                            | 1.459                                   | 0.695                            | 0.622                                     | 1.112                 | 2.119 | 1.235 | 1.648 |
| RSE Column Factors                                     |  |   |                                  |   |                                  |   |                                  |   |                       |       |       |       |
| <b>Housing Structure by Status of Unit</b>             |  |   |                                  |   |                                  |   |                                  |   |                       |       |       |       |
| Single-Family Detached .....                           | 114.5  | 132.4                                   | 70.9                             | 62.9                                      | 139.0                            | 101.6                                   | 35.7                             | 29.3                                      | 66.7                  | 56.2  | 32.5  | 31.1  |
| Owned .....  | 116.6  | 134.4                                   | 71.5                             | 63.5                                      | 142.5                            | 105.1                                   | 36.8                             | 30.2                                      | 67.4                  | 56.5  | 32.4  | 32.5  |
| Rented .....   | 101.3  | 120.6                                   | 63.5                             | 60.2                                      | 103.6                            | 85.1                                    | 28.5                             | 23.3                                      | 57.4                  | 54.6  | 33.1  | 31.7  |
| Single-Family Attached .....                           | 98.9   | 112.6                                   | 54.2                             | Q   | 142.1                            | NC                                      | 30.2                             | 21.3                                      | 52.7                  | Q     | 24.8  | NC    |
| Owned .....  | 104.7  | 117.8                                   | 52.1                             | Q   | 145.2                            | NC                                      | 28.9                             | 20.4                                      | 50.5                  | Q     | 25.3  | NC    |
| Rented .....   | 83.7   | 98.4                                    | 58.9                             | Q   | NC                               | 33.6                                    | 23.7                             | Q   | 57.9                  | Q     | Q     | 12.77 |
| Building of 2 to 4 Units .....                         | 93.4   | 102.4                                   | 44.0                             | 41.3                                      | 120.6                            | NC                                      | 19.6                             | 15.8                                      | 41.5                  | 36.9  | 15.8  | NC    |
| Owned .....  | 121.1  | 133.3                                   | Q                                | Q   | 149.0                            | NC                                      | 21.0                             | 21.2                                      | Q                     | Q     | 16.9  | NC    |
| Rented .....   | 86.6   | 95.3                                    | 45.3                             | 40.2                                      | 109.2                            | NC                                      | 19.2                             | 14.6                                      | 42.8                  | 35.7  | 15.3  | NC    |
| Building of 5 or More Units .....                      | 64.2   | 77.6                                    | 36.0                             | 29.7                                      | 96.8                             | NC                                      | 18.5                             | 12.7                                      | 31.4                  | 23.9  | 8.9   | NC    |
| Owned .....  | 67.1   | 97.8                                    | 40.5                             | Q   | 83.7                             | NC                                      | 23.6                             | 19.5                                      | 32.9                  | Q     | 9.9   | NC    |
| Rented .....   | 64.0   | 76.6                                    | 35.5                             | 28.7                                      | 97.9                             | NC                                      | 18.1                             | 12.4                                      | 31.2                  | 24.3  | 8.8   | NC    |
| Mobile Home .....                                      | 76.5   | 95.6                                    | 56.6                             | 43.4                                      | 88.1                             | 70.8                                    | 30.6                             | 22.9                                      | 54.6                  | 41.1  | 26.1  | 25.9  |
| Owned .....  | 76.9   | 97.4                                    | 58.2                             | 45.8                                      | 88.1                             | 74.2                                    | 31.9                             | 23.4                                      | 56.2                  | 45.2  | 24.4  | 27.7  |
| Rented .....   | 74.1   | 86.5                                    | Q                                | Q   | 104.9                            | 55.6                                    | 24.5                             | 20.7                                      | Q                     | Q     | 31.7  | 18.1  |
| <b>Number of Rooms</b>                                 |  |   |                                  |   |                                  |   |                                  |   |                       |       |       |       |
| 1 .....  | 52.1   | 63.5                                    | Q                                | Q   | Q                                | Q                                       | 12.2                             | 9.2                                       | Q                     | Q     | Q     | 27.98 |
| 2 .....  | 54.3   | 60.9                                    | 33.1                             | 37.6                                      | 76.3                             | Q                                       | 12.1                             | 8.7                                       | 19.0                  | 21.9  | 4.7   | Q     |
| 3 .....  | 60.1   | 73.2                                    | 35.1                             | 28.1                                      | 93.3                             | 67.0                                    | 18.6                             | 11.5                                      | 32.2                  | 24.2  | 11.3  | 19.2  |
| 4 .....  | 77.1   | 91.9                                    | 45.4                             | 37.8                                      | 98.7                             | 73.0                                    | 23.8                             | 16.9                                      | 42.6                  | 35.2  | 20.8  | 24.0  |
| 5 .....  | 96.3   | 109.0                                   | 60.3                             | 52.0                                      | 115.5                            | 93.3                                    | 29.4                             | 22.5                                      | 56.4                  | 46.9  | 25.9  | 4.01  |
| 6 .....  | 112.9  | 128.3                                   | 62.6                             | 59.2                                      | 135.7                            | 121.3                                   | 34.1                             | 27.5                                      | 60.7                  | 51.5  | 29.4  | 37.2  |
| 7 .....  | 127.9  | 144.1                                   | 76.3                             | 73.1                                      | 148.3                            | 115.6                                   | 38.9                             | 31.7                                      | 70.7                  | 72.0  | 30.7  | 40.3  |
| 8 or More .....  | 153.7  | 174.4                                   | 88.9                             | 86.0                                      | 184.8                            | 126.8                                   | 45.3                             | 38.8                                      | 82.9                  | 71.5  | 38.4  | 5.34  |
| <b>Number of Rooms That Can Be Air Conditioned</b>     |  |   |                                  |   |                                  |   |                                  |   |                       |       |       |       |
| All .....  | 96.7   | 119.2                                   | 56.6                             | NC  | 119.7                            | 102.4                                   | 38.6                             | 30.9                                      | 52.7                  | NC    | 31.9  | 36.8  |
| Some .....   | 117.3  | 123.6                                   | 54.4                             | NC  | 141.6                            | 91.0                                    | 26.1                             | 21.7                                      | 50.7                  | NC    | 25.4  | 30.5  |
| None .....   | 97.6   | 113.1                                   | —                                | 45.7                                      | 119.8                            | 83.4                                    | 22.6                             | 17.7                                      | —                     | 40.2  | 23.0  | 22.0  |
| <b>Measured Heated Area of Residence (square feet)</b> |  |   |                                  |   |                                  |   |                                  |   |                       |       |       |       |
| Fewer than 600 .....                                   | 63.1   | 74.3                                    | 36.1                             | 30.7                                      | 99.0                             | 68.0                                    | 16.5                             | 11.9                                      | 27.5                  | 20.1  | 9.7   | 18.4  |
| 600 to 999 .....                                       | 77.2   | 91.3                                    | 42.7                             | 38.8                                      | 96.0                             | 68.6                                    | 22.9                             | 17.1                                      | 39.5                  | 35.9  | 19.7  | 7.65  |
| 1,000 to 1,599 .....                                   | 92.8   | 108.7                                   | 55.9                             | 53.5                                      | 119.5                            | 103.8                                   | 32.3                             | 24.0                                      | 53.7                  | 48.1  | 26.6  | 23.2  |
| 1,600 to 1,999 .....                                   | 113.9  | 131.4                                   | 66.7                             | 63.8                                      | 127.9                            | 96.7                                    | 35.5                             | 28.2                                      | 63.7                  | 60.2  | 27.8  | 4.18  |
| 2,000 to 2,399 .....                                   | 129.7  | 144.1                                   | 73.9                             | Q   | 143.8                            | 116.4                                   | 36.7                             | 31.6                                      | 66.1                  | Q     | 28.9  | 32.3  |
| 2,400 to 2,999 .....                                   | 145.0  | 160.7                                   | 82.2                             | Q   | 152.1                            | 125.3                                   | 37.6                             | 32.4                                      | 79.6                  | Q     | 33.1  | 37.2  |
| 3,000 or More .....                                    | 169.0  | 184.1                                   | 96.0                             | Q   | 207.4                            | 166.9                                   | 46.8                             | 38.6                                      | 87.9                  | Q     | 42.7  | 42.4  |
| <b>Year of Construction</b>                            |  |   |                                  |   |                                  |   |                                  |   |                       |       |       |       |
| 1939 or Before .....                                   | 120.4  | 131.9                                   | 53.2                             | 48.0                                      | 137.3                            | 87.8                                    | 22.5                             | 19.4                                      | 47.9                  | 33.2  | 23.0  | 26.5  |
| 1940 to 1949 .....                                     | 103.9  | 113.3                                   | 54.3                             | 46.2                                      | 122.1                            | 106.1                                   | 26.2                             | 22.8                                      | 52.9                  | 44.5  | 23.6  | 33.3  |
| 1950 to 1959 .....                                     | 109.6  | 117.8                                   | 58.0                             | 47.1                                      | 128.1                            | 96.5                                    | 29.0                             | 26.1                                      | 53.0                  | 39.7  | 27.9  | 8.32  |
| 1960 to 1969 .....                                     | 99.7   | 110.4                                   | 58.4                             | 38.9                                      | 114.1                            | 88.8                                    | 30.2                             | 26.8                                      | 54.6                  | 32.7  | 24.7  | 6.67  |
| 1970 to 1974 .....                                     | 95.3   | 116.9                                   | 59.0                             | 43.0                                      | 106.1                            | 90.5                                    | 32.6                             | 25.2                                      | 53.4                  | 33.0  | 29.6  | 31.3  |
| 1975 to 1979 .....                                     | 86.1   | 116.5                                   | 58.6                             | 48.6                                      | 126.3                            | 103.4                                   | 41.7                             | 30.8                                      | 53.9                  | 46.9  | 35.5  | 7.40  |
| 1980 to 1984 .....                                     | 71.2   | 97.0                                    | 53.3                             | 49.2                                      | 89.1                             | 75.9                                    | 37.9                             | 25.3                                      | 50.1                  | 48.0  | 31.1  | 27.7  |
| 1985 or After .....                                    | 71.1   | 108.6                                   | 52.2                             | Q   | 93.0                             | 93.0                                    | 39.9                             | 22.7                                      | 51.7                  | Q     | Q     | 8.55  |

See footnotes at end of table.

**Table 11. Consumption of All Major Fuels and Consumption of Electricity per Household by Main Heating Fuel, 1987 (Continued)**  
 (Million Btu per Household)

| Household Characteristics                             | Consumption of Natural Gas, Electricity, Fuel Oil or Kerosene, LPG |                                  |                          |   |  |                                  |                          |                   | Consumption of Electricity                |  |       |       |       |  |                   |                      | RSE Row Factors |  |  |  |  |  |
|---|--|----------------------------------|--------------------------|---|--|----------------------------------|--------------------------|-------------------|---|--|-------|-------|-------|--|-------------------|----------------------|-----------------|--|--|--|--|--|
|   | In All Households  | In Households Where:             |                          |   |  |                                  |                          | In All Households | In Households Where:                      |  |       |       |       |  | In All Households | In Households Where: |                 |  |  |  |  |  |
|   |  | Main Heating Fuel is Electricity |                          | Main Heating Fuel is Fuel Oil or Kerosene | Main Heating Fuel is Liquified Petroleum Gas | Main Heating Fuel is Electricity |                          |                   | Main Heating Fuel is Fuel Oil or Kerosene | Main Heating Fuel is Liquified Petroleum Gas |       |       |       |  |                   |                      |                 |  |  |  |  |  |
|   |  | With Air Conditioning            | Without Air Conditioning |   |  | With Air Conditioning            | Without Air Conditioning |                   |   |  |       |       |       |  |                   |                      |                 |  |  |  |  |  |
| RSE Column Factors:                                   | 0.475  | 0.497                            | 1.043                    | 1.866                                     | 0.852  | 1.459                            | 0.585                    | 0.624             | 1.112                                     | 2.119  | 1.235 | 1.648 |       |  |                   |                      |                 |  |  |  |  |  |
| <b>Status of Unit</b>                                 |  |                                  |                          |   |  |                                  |                          |                   |   |  |       |       |       |  |                   |                      |                 |  |  |  |  |  |
| Owned .....   | 112.3  | 131.1                            | 66.4                     | 59.1                                      | 137.2  | 96.1                             | 35.2                     | 28.8              | 62.6                                      | 53.1   | 30.1  | 31.1  | 2.99  |  |                   |                      |                 |  |  |  |  |  |
| Condominium .....                                     | 68.8   | 93.2                             | 41.1                     | Q   | Q  | NC                               | 27.9                     | 20.2              | 36.1                                      | Q  | Q     | NC    | 15.49 |  |                   |                      |                 |  |  |  |  |  |
| Not a Condominium .....                               | 113.5  | 132.1                            | 68.6                     | 59.5                                      | 137.2  | 96.1                             | 35.4                     | 29.0              | 64.9                                      | 53.4   | 30.1  | 31.1  | 2.96  |  |                   |                      |                 |  |  |  |  |  |
| Rented .....  | 79.7   | 94.3                             | 41.0                     | 36.7                                      | 103.9  | 76.0                             | 21.7                     | 16.4              | 37.1                                      | 31.6   | 16.6  | 22.4  | 4.81  |  |                   |                      |                 |  |  |  |  |  |
| Public Housing .....                                  | 69.4   | 78.5                             | 36.3                     | 31.2                                      | 97.6   | NC                               | 17.4                     | 13.9              | 31.1                                      | 28.3   | 8.9   | NC    | 15.18 |  |                   |                      |                 |  |  |  |  |  |
| Not Public Housing .....                              | 80.6   | 95.8                             | 41.4                     | 37.6                                      | 104.5  | 76.0                             | 22.1                     | 16.6              | 37.5                                      | 32.1   | 17.3  | 22.4  | 5.09  |  |                   |                      |                 |  |  |  |  |  |
| Rent Subsidy .....                                    | 76.4   | 95.4                             | 33.2                     | 33.4                                      | 87.5   | Q                                | 19.1                     | 15.9              | 31.6                                      | 33.4   | 11.2  | Q     | 15.01 |  |                   |                      |                 |  |  |  |  |  |
| No Rent Subsidy .....                                 | 80.8   | 95.8                             | 41.7                     | 37.9                                      | 105.7  | 75.5                             | 22.2                     | 16.7              | 37.7                                      | 32.1   | 17.7  | 22.3  | 5.83  |  |                   |                      |                 |  |  |  |  |  |
| <b>1987 Family Income</b>                             |  |                                  |                          |   |  |                                  |                          |                   |   |  |       |       |       |  |                   |                      |                 |  |  |  |  |  |
| Less than \$5,000 .....                               | 82.6   | 105.3                            | 41.3                     | 31.8                                      | 97.2   | 71.1                             | 20.2                     | 15.6              | 36.7                                      | 26.3   | 17.0  | 24.4  | 9.10  |  |                   |                      |                 |  |  |  |  |  |
| \$5,000 to \$9,999 .....                              | 89.8   | 103.3                            | 49.0                     | 35.2                                      | 109.6  | 82.1                             | 22.7                     | 17.7              | 45.7                                      | 31.7   | 19.3  | 22.6  | 6.38  |  |                   |                      |                 |  |  |  |  |  |
| \$10,000 to \$14,999 .....                            | 91.1   | 106.5                            | 45.2                     | 40.5                                      | 113.9  | 85.6                             | 24.5                     | 19.9              | 40.7                                      | 35.9   | 24.6  | 25.8  | 5.74  |  |                   |                      |                 |  |  |  |  |  |
| \$15,000 to \$19,999 .....                            | 92.4   | 107.0                            | 42.7                     | 46.3                                      | 124.1  | 94.6                             | 26.5                     | 21.0              | 40.9                                      | 43.1   | 23.4  | 32.8  | 6.65  |  |                   |                      |                 |  |  |  |  |  |
| \$20,000 to \$24,999 .....                            | 95.8   | 110.9                            | 59.2                     | 51.9                                      | 111.7  | 109.7                            | 30.9                     | 22.8              | 53.6                                      | 48.3   | 25.9  | 35.4  | 5.77  |  |                   |                      |                 |  |  |  |  |  |
| \$25,000 to \$34,999 .....                            | 98.7   | 117.3                            | 54.4                     | 45.2                                      | 120.8  | 99.8                             | 32.2                     | 25.8              | 52.6                                      | 36.1   | 25.2  | 32.8  | 5.24  |  |                   |                      |                 |  |  |  |  |  |
| \$35,000 to \$49,999 .....                            | 112.4  | 131.3                            | 62.8                     | 57.4                                      | 146.8  | 105.6                            | 38.0                     | 29.7              | 60.3                                      | 56.7   | 31.9  | 36.5  | 5.74  |  |                   |                      |                 |  |  |  |  |  |
| \$50,000 or More .....                                | 129.0  | 144.6                            | 74.7                     | 58.6                                      | 172.0  | 129.4                            | 40.5                     | 33.8              | 66.9                                      | 45.0   | 33.4  | 40.7  | 6.13  |  |                   |                      |                 |  |  |  |  |  |
| <b>Below 100 Percent of Poverty Line</b>              | 89.3   | 109.8                            | 49.1                     | 36.4                                      | 102.0  | 80.9                             | 23.6                     | 18.6              | 44.3                                      | 30.9   | 21.8  | 24.7  | 6.50  |  |                   |                      |                 |  |  |  |  |  |
| <b>Below 125 Percent of Poverty Line</b>              | 90.7   | 108.8                            | 49.8                     | 37.0                                      | 105.6  | 84.8                             | 24.0                     | 19.1              | 45.3                                      | 30.2   | 21.7  | 24.4  | 5.23  |  |                   |                      |                 |  |  |  |  |  |
| <b>Assistance for Heating in Winter</b>               |  |                                  |                          |   |  |                                  |                          |                   |   |  |       |       |       |  |                   |                      |                 |  |  |  |  |  |
| Yes .....   | 101.1  | 119.5                            | 52.9                     | 41.4                                      | 107.9  | 94.5                             | 22.0                     | 17.7              | 49.3                                      | 27.6   | 21.3  | 20.6  | 8.87  |  |                   |                      |                 |  |  |  |  |  |
| No .....  | 100.8  | 117.8                            | 56.5                     | 45.8                                      | 127.5  | 92.2                             | 30.9                     | 24.7              | 52.6                                      | 40.8   | 25.9  | 30.6  | 2.87  |  |                   |                      |                 |  |  |  |  |  |
| <b>Assistance for Weatherization of Residence</b>     |  |                                  |                          |   |  |                                  |                          |                   |   |  |       |       |       |  |                   |                      |                 |  |  |  |  |  |
| Yes .....   | 102.2  | 116.8                            | Q                        | Q   | 115.8  | Q                                | 21.4                     | 18.3              | Q   | Q  | 23.9  | Q     | 13.96 |  |                   |                      |                 |  |  |  |  |  |
| No .....  | 100.8  | 117.9                            | 56.4                     | 45.9                                      | 126.5  | 92.2                             | 30.6                     | 24.4              | 52.5                                      | 40.4   | 25.7  | 29.6  | 2.78  |  |                   |                      |                 |  |  |  |  |  |
| <b>Household Owns or Has Regular Use of a Vehicle</b> |  |                                  |                          |   |  |                                  |                          |                   |   |  |       |       |       |  |                   |                      |                 |  |  |  |  |  |
| Yes .....   | 101.8  | 119.6                            | 57.5                     | 47.5                                      | 131.0  | 93.1                             | 32.4                     | 25.8              | 53.7                                      | 42.2   | 28.9  | 30.5  | 2.88  |  |                   |                      |                 |  |  |  |  |  |
| No .....  | 93.8   | 106.2                            | 41.6                     | 35.3                                      | 108.4  | 84.2                             | 16.9                     | 14.0              | 36.5                                      | 29.0   | 13.2  | 18.0  | 7.86  |  |                   |                      |                 |  |  |  |  |  |
| <b>Race of Householder</b>                            |  |                                  |                          |   |  |                                  |                          |                   |   |  |       |       |       |  |                   |                      |                 |  |  |  |  |  |
| White .....   | 100.2  | 118.7                            | 56.1                     | 46.0                                      | 125.4  | 93.4                             | 31.6                     | 25.0              | 52.4                                      | 41.5   | 27.2  | 29.9  | 2.86  |  |                   |                      |                 |  |  |  |  |  |
| Black .....   | 110.3  | 120.1                            | 60.1                     | 41.2                                      | 139.7  | 75.4                             | 25.4                     | 22.2              | 55.1                                      | 30.8   | 18.3  | 27.9  | 7.90  |  |                   |                      |                 |  |  |  |  |  |
| Other .....   | 81.7   | 90.6                             | 52.7                     | 45.8                                      | 101.0  | Q                                | 20.3                     | 16.6              | 45.2                                      | 34.3   | 9.7   | Q     | 11.08 |  |                   |                      |                 |  |  |  |  |  |
| <b>Householder of Hispanic Descent</b>                |  |                                  |                          |   |  |                                  |                          |                   |   |  |       |       |       |  |                   |                      |                 |  |  |  |  |  |
| Yes .....   | 87.3   | 94.2                             | 60.4                     | 47.9                                      | 119.4  | Q                                | 25.8                     | 19.0              | 55.0                                      | 36.4   | 16.6  | Q     | 10.83 |  |                   |                      |                 |  |  |  |  |  |
| No .....  | 101.6  | 119.3                            | 56.2                     | 45.5                                      | 126.8  | 92.0                             | 30.7                     | 24.6              | 52.4                                      | 40.4   | 26.2  | 29.5  | 2.79  |  |                   |                      |                 |  |  |  |  |  |

See footnotes at end of table.

## AVERAGE CONSUMPTION BY HEATING FUEL

**Table 11. Consumption of All Major Fuels and Consumption of Electricity per Household by Main Heating Fuel, 1987 (Continued)**

| Household Characteristics                  | Consumption of Natural Gas, Electricity, Fuel Oil or Kerosene, LPG (Million Btu per Household) |                                  |  |   | Consumption of Electricity       |                                  |                                       |                                      |
|--|--|----------------------------------|--|---|----------------------------------|----------------------------------|---------------------------------------|--------------------------------------|
|  | In Households Where:   |                                  |  |   | In Households Where:             |                                  |                                       |                                      |
|  | Main Heating Fuel is Electricity   | Main Heating Fuel is Natural Gas | Main Heating Fuel is Liquefied Petroleum Gas | Main Heating Fuel is Fuel Oil or Kerosene | Main Heating Fuel is Electricity | Main Heating Fuel is Natural Gas | Main Heating Fuel is Air Conditioning | Main Heating Fuel is Oil or Kerosene |
| RSE Column Factors:                        | 0.475  | 0.487                            | 1.043  | 1.896                                     | 0.855                            | 1.459                            | 0.585                                 | 0.624                                |
| <b>Age of Householder</b>                  |  |                                  |  |   |                                  |                                  |                                       |                                      |
| Under 25 Years .....                       | 76.9   | 94.3                             | 43.3   | 32.1                                      | 113.2                            | 72.7                             | 24.6                                  | 16.7                                 |
| 25 to 34 Years .....                       | 93.9   | 111.1                            | 51.9   | 44.6                                      | 115.1                            | 95.0                             | 29.1                                  | 22.6                                 |
| 35 to 44 Years .....                       | 105.7  | 124.3                            | 62.7   | 55.4                                      | 133.4                            | 105.0                            | 35.4                                  | 26.9                                 |
| 45 to 59 Years .....                       | 112.9  | 134.5                            | 66.0   | 49.3                                      | 142.8                            | 91.9                             | 36.0                                  | 30.7                                 |
| 60 Years and Over .....                    | 100.4  | 113.2                            | 52.9   | 43.7                                      | 121.9                            | 90.1                             | 25.6                                  | 21.3                                 |
| <b>Household Size</b>                      |  |                                  |  |   |                                  |                                  |                                       |                                      |
| 1 Person .....                             | 79.4   | 94.8                             | 39.5   | 33.2                                      | 100.2                            | 80.1                             | 19.3                                  | 14.6                                 |
| 2 Persons .....                            | 96.0   | 113.3                            | 53.7   | 44.1                                      | 125.3                            | 83.8                             | 29.9                                  | 24.0                                 |
| 3 Persons .....                            | 107.8  | 123.2                            | 65.1   | 55.6                                      | 133.6                            | 98.6                             | 34.8                                  | 27.5                                 |
| 4 Persons .....                            | 120.8  | 140.8                            | 71.3   | 67.3                                      | 142.3                            | 116.8                            | 38.6                                  | 31.7                                 |
| 5 Persons .....                            | 123.2  | 140.8                            | 81.1   | Q   | 144.3                            | 99.3                             | 38.8                                  | 31.7                                 |
| 6 or More Persons .....                    | 131.2  | 148.2                            | 84.0   | 82.1                                      | 175.4                            | 113.9                            | 39.2                                  | 31.9                                 |
| <b>Secondary Heating</b>                   |  |                                  |  |   |                                  |                                  |                                       |                                      |
| Yes .....                                  | 107.0  | 129.3                            | 67.5   | 54.6                                      | 135.3                            | 92.1                             | 37.0                                  | 29.9                                 |
| Over 33 Percent of Home's Total Heat ..... | 91.9   | 104.3                            | 71.7   | 56.8                                      | 134.1                            | 61.8                             | 38.8                                  | 28.4                                 |
| No .....                                   | 96.5   | 111.3                            | 48.7   | 39.1                                      | 120.2                            | 92.9                             | 25.9                                  | 21.1                                 |

— Data not applicable.

nc No cases in sample.

o Data withheld either because the RSE was greater than 50 percent or fewer than 10 households were sampled.  
Notes: • To obtain a Relative Standard Error (RSE) percentage for any table cell, multiply the cell's corresponding column and row factors. • Because of rounding, data may not sum to totals. • Percentages are calculated on unrounded numbers. • See "Glossary" for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Forms EIA-457 A, B, C, D, E, F, G of the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).

## AVERAGE EXPENDITURES FOR ALL FUELS

**Table 12. Energy Expenditures per Household for All Major Fuels, 1987**

|                                     |                     | Average Total Fuel Expenditure<br>(dollars per household) |                                     |                          |                             |  |  |
|-------------------------------------|---------------------|---|-------------------------------------|--------------------------|-----------------------------|--|--|
|                                     |                     | In Households Where:                                      |                                     |                          |                             |  |  |
| Household<br>Characteristics        | RSE Column Factors: | Main Heating<br>Fuel Is<br>Natural Gas                    | Main Heating Fuel<br>Is Electricity | With Air<br>Conditioning | Without Air<br>Conditioning | Main Heating<br>Fuel Is<br>Fuel Oil or<br>Kerosene | Main Heating<br>Fuel Is<br>Liquefied<br>Petroleum<br>Gas |
|                                     |                     | 0.451   | 0.578                               | 1.186                    | 2.231                       | 1.012  | 1.432  |
| Total U.S. Households .....         | 1,080               | 1,073   | 1,103                               | 772                      | 1,260                       | 1,163  | 2.32   |
| <b>Census Region and Division</b>   |                     |   |                                     |                          |                             |  |  |
| Northeast .....                     | 1,276               | 1,313   | 1,188                               | 1,200                    | 1,294                       | Q  | 5.52   |
| New England .....                   | 1,222               | 1,220   | 1,133                               | 1,022                    | 1,284                       | Q  | 7.11   |
| Middle Atlantic .....               | 1,292               | 1,329   | 1,198                               | 1,318                    | 1,299                       | Q  | 6.51   |
| Midwest .....                       | 1,124               | 1,096   | 1,257                               | 1,273                    | 1,271                       | 1,309  | 4.89   |
| East North Central .....            | 1,149               | 1,113   | 1,296                               | 1,308                    | 1,298                       | 1,382  | 6.61   |
| West North Central .....            | 1,064               | 1,053   | 1,176                               | Q                        | 1,168                       | 1,175  | 6.50   |
| South .....                         | 1,081               | 1,110   | 1,108                               | 720                      | 1,185                       | 1,185  | 3.29   |
| South Atlantic .....                | 1,128               | 1,171   | 1,185                               | 673                      | 1,185                       | 1,112  | 4.52   |
| East South Central .....            | 992                 | 990   | 1,045                               | 770                      | 1,189                       | 1,112  | 5.05   |
| West South Central .....            | 1,060               | 1,104   | 993                                 | Q                        | 1,020                       | 8.19   | 6.50   |
| West .....                          | 819                 | 834   | 913                                 | 605                      | 892                         | 1,071  | 6.50   |
| Mountain .....                      | 944                 | 923   | 1,108                               | 824                      | Q                           | 1,152  | 7.65   |
| Pacific .....                       | 779                 | 800   | 819                                 | 590                      | 900                         | 1,031  | 8.53   |
| <b>Metropolitan Status</b>          |                     |   |                                     |                          |                             |  |  |
| Metropolitan .....                  | 1,093               | 1,086   | 1,087                               | 738                      | 1,276                       | 1,117  | 2.86   |
| Central City .....                  | 1,001               | 1,029   | 931                                 | 645                      | 1,075                       | 1,009  | 4.77   |
| Outside Central City .....          | 1,160               | 1,136   | 1,184                               | 798                      | 1,405                       | 1,140  | 3.53   |
| Nonmetropolitan .....               | 1,035               | 1,007   | 1,179                               | 881                      | 1,208                       | 1,200  | 3.96   |
| <b>Climate Zone</b>                 |                     |   |                                     |                          |                             |  |  |
| Under 2,000 CDD and...              |                     |   |                                     |                          |                             |  |  |
| Over 7,000 HDD .....                | 1,030               | 970   | 1,188                               | 1,012                    | 1,188                       | 1,175  | 5.29   |
| 5,500 to 7,000 HDD .....            | 1,156               | 1,118   | 1,248                               | 931                      | 1,427                       | 1,407  | 4.96   |
| 4,000 to 5,499 HDD .....            | 1,138               | 1,202   | 1,127                               | 687                      | 1,198                       | 1,218  | 5.10   |
| Under 4,000 HDD .....               | 931                 | 898   | 1,000                               | 608                      | 1,174                       | 1,217  | 4.99   |
| 2,000 CDD or More and ...           |                     |   |                                     |                          |                             |  |  |
| Under 4,000 HDD .....               | 1,068               | 1,093   | 1,107                               | 596                      | 1,026                       | 952  | 5.46   |
| <b>Payment Method for Utilities</b> |                     |   |                                     |                          |                             |  |  |
| All Paid by Household .....         | 1,150               | 1,151   | 1,176                               | 847                      | 1,382                       | 1,185  | 2.55   |
| Some Paid, Some in Rent .....       | 762                 | 751   | 663                                 | 549                      | 918                         | 8.37   | 10.18  |
| All Included in Rent .....          | 703                 | 731   | 666                                 | 572                      | 706                         | Q  | 12.76  |
| Other Method .....                  | 928                 | 941   | 811                                 | Q                        | 1,222                       | Q  |  |

See footnotes at end of table.

## AVERAGE EXPENDITURES FOR ALL FUELS

**Table 12. Energy Expenditures per Household for All Major Fuels, 1987 (Continued)**

|   |                   | Average Total Fuel Expenditure<br>(dollars per household) |                          |                                  |          |  |                 |
|---|-------------------|---|--------------------------|----------------------------------|----------|--|-----------------|
|   |                   | In Households Where:                                      |                          |                                  |          |  |                 |
| Household Characteristics                       | In All Households | Main Heating Fuel Is Electricity                          |                          | Main Heating Fuel Is Natural Gas |          | Main Heating Fuel Is Liquefied Petroleum Gas | RSE Row Factors |
|   |                   | With Air Conditioning                                     | Without Air Conditioning | Fuel Oil or Kerosene             | Gasoline |  |                 |
| RSF Column Factors:                             | 0.451             | 0.578   | 1.186                    | 2.231                            | 1.012    | 1.432  |                 |
| <b>Housing Structure by Status of Unit</b>      |                   |   |                          |                                  |          |  |                 |
| Single-Family Detached                          |                   |   |                          |                                  |          |  |                 |
| Owned .....                                     | 1,226             | 1,213   | 1,374                    | 1,068                            | 1,425    | 1,240  | 2.46            |
| Rented .....                                    | 1,257             | 1,242   | 1,393                    | 1,087                            | 1,453    | 1,286  | 2.64            |
| Single-Family Attached                          |                   |   |                          |                                  |          |  |                 |
| Owned .....                                     | 1,135             | 1,112   | 1,125                    | 982                              | 1,185    | 1,024  | 6.35            |
| Rented .....                                    | 1,180             | 1,160   | 1,096                    | Q                                | 1,424    | NC   | 8.98            |
| Building of 2 to 4 Units                        |                   |   |                          |                                  |          |  |                 |
| Owned .....                                     | 1,017             | 982   | 1,071                    | Q                                | 1,449    | NC   | 10.15           |
| Rented .....                                    | 905               | 896   | 1,156                    | Q                                | 1,159    | NC   | 15.78           |
| Building of 5 or More Units                     |                   |   |                          |                                  |          |  |                 |
| Owned .....                                     | 1,159             | 1,215   | 898                      | 694                              | 1,159    | NC   | 5.24            |
| Rented .....                                    | 842               | 823   | 907                      | Q                                | 1,378    | NC   | 10.65           |
| Mobile Home                                     |                   |   |                          |                                  |          |  |                 |
| Owned .....                                     | 681               | 665   | 709                      | 668                              | 1,071    | NC   | 5.36            |
| Rented .....                                    | 848               | 999   | 824                      | 482                              | 793      | NC   | 4.96            |
| Number of Rooms                                 |                   |   |                          |                                  |          |  |                 |
| 1 .....   | 546               | 586   | Q                        | Q                                | Q        | Q  | 43.90           |
| 2 .....   | 508               | 460   | 498                      | 626                              | 527      | Q  | 10.28           |
| 3 .....   | 659               | 607   | 731                      | 471                              | 808      | 872  | 5.00            |
| 4 .....   | 840               | 809   | 877                      | 661                              | 1,018    | 974  | 3.25            |
| 5 .....   | 1,028             | 987   | 1,159                    | 856                              | 1,185    | 1,131  | 3.03            |
| 6 .....   | 1,214             | 1,191   | 1,255                    | 957                              | 1,391    | 1,552  | 3.74            |
| 7 .....   | 1,374             | 1,363   | 1,498                    | 1,306                            | 1,459    | 1,468  | 4.52            |
| 8 or More .....                                 | 1,614             | 1,602   | 1,725                    | 1,430                            | 1,873    | 1,486  | 4.43            |
| Number of Rooms That Can Be Air Conditioned     |                   |   |                          |                                  |          |  |                 |
| All .....                                       | 1,164             | 1,173   | 1,109                    | NC                               | 1,303    | 1,337  | 3.04            |
| Some .....                                      | 1,161             | 1,107   | 1,053                    | NC                               | 1,408    | 1,117  | 4.12            |
| None .....                                      | 933               | —   | —                        | 772                              | 1,147    | 1,016  | 3.18            |
| Measured Heated Area of Residence (square feet) |                   |   |                          |                                  |          |  |                 |
| Fewer than 600 .....                            | 675               | 631   | 617                      | 509                              | 839      | 852  | 6.60            |
| 600 to 999 .....                                | 825               | 805   | 851                      | 658                              | 978      | 912  | 3.36            |
| 1,000 to 1,599 .....                            | 1,046             | 1,042   | 1,037                    | 1,098                            | 889      | 1,232  | 3.47            |
| 1,600 to 1,999 .....                            | 1,238             | 1,234   | 1,111                    | 1,312                            | 1,121    | 1,306  | 4.12            |
| 2,000 to 2,399 .....                            | 1,358             | 1,337   | 1,345                    | Q                                | 1,432    | 1,572  | 5.21            |
| 2,400 to 2,999 .....                            | 1,448             | 1,447   | 1,447                    | Q                                | 1,517    | 1,598  | 3.85            |
| 3,000 or More .....                             | 1,724             | 1,650   | 1,827                    | Q                                | 2,039    | 1,812  | 6.14            |
| Year of Construction                            |                   |   |                          |                                  |          |  |                 |
| 1939 or Before .....                            | 1,106             | 1,093   | 1,017                    | 802                              | 1,312    | 1,044  | 6.05            |
| 1940 to 1949 .....                              | 1,042             | 1,042   | 1,037                    | 1,098                            | 665      | 1,166  | 3.37            |
| 1950 to 1959 .....                              | 1,121             | 1,100   | 1,089                    | 805                              | 1,301    | 1,191  | 6.02            |
| 1960 to 1969 .....                              | 1,060             | 1,069   | 1,075                    | 660                              | 1,163    | 1,148  | 4.87            |
| 1970 to 1974 .....                              | 1,062             | 1,068   | 1,126                    | 618                              | 1,194    | 1,135  | 7.18            |
| 1975 to 1979 .....                              | 1,131             | 1,142   | 1,138                    | 841                              | 1,402    | 1,307  | 6.95            |
| 1980 to 1984 .....                              | 984               | 941   | 1,082                    | 828                              | 1,028    | 1,006  | 8.05            |
| 1985 or After .....                             | 1,049             | 965   | 1,110                    | Q                                | 1,268    | 1,268  | 8.10            |

See footnotes at end of table.

## AVERAGE EXPENDITURES FOR ALL FUELS

**Table 12. Energy Expenditures per Household for All Major Fuels, 1987 (Continued)**

|   |                      | Average Total Fuel Expenditure<br>(dollars per household) |       |  |  |
|---|----------------------|---|-------|--|--|
|   |                      | In Households Where:                                      |       |  |  |
| Household<br>Characteristics                              | In All<br>Households | Main Heating<br>Fuel<br>Is Electricity                    |       | Main Heating<br>Fuel Is<br>Fuel Oil or<br>Kerosene | Main Heating<br>Fuel Is<br>Liquefied<br>Petroleum<br>Gas |
|   |                      | 0.451   | 0.578 | 1.186  | 2.231  |
| RSE Column Factors:                                       |                      | 1.012   |       | 1.012  | 1.432  |
| Status of Unit  |                      |   |       |  | RSE Row<br>Factors                                       |
| Owned .....   | 1,221                | 1,218   | 1,303 | 1,021  | 1,397  |
| Condominium .....   | 883                  | 892   | 873   | Q  | 1,211  |
| Not a Condominium .....                                   | 1,230                | 1,226   | 1,341 | 1,024  | 1,398  |
| Rented .....  | 819                  | 816   | 798   | 606  | 977  |
| Public Housing .....                                      | 651                  | 668   | 656   | 486  | 719  |
| Not Public Housing .....                                  | 833                  | 829   | 807   | 626  | 1,000  |
| Rent Subsidy .....  | 810                  | 881   | 689   | 668  | 786  |
| No Rent Subsidy .....                                     | 834                  | 827   | 813   | 624  | 1,017  |
| <b>1987 Family Income</b>                                 |                      |   |       |  |  |
| Less than \$5,000 .....                                   | 818                  | 862   | 753   | 552  | 904  |
| \$5,000 to \$9,999 .....                                  | 881                  | 871   | 912   | 622  | 976  |
| \$10,000 to \$14,999 .....                                | 927                  | 930   | 843   | 661  | 988  |
| \$15,000 to \$19,999 .....                                | 967                  | 938   | 872   | 833  | 1,016  |
| \$20,000 to \$24,999 .....                                | 1,038                | 1,004   | 1,075 | 852  | 1,126  |
| \$25,000 to \$34,999 .....                                | 1,091                | 1,084   | 1,094 | 770  | 1,235  |
| \$35,000 to \$49,999 .....                                | 1,257                | 1,239   | 1,285 | 985  | 1,158  |
| \$50,000 or More .....                                    | 1,440                | 1,417   | 1,483 | 923  | 1,418  |
| <b>Below 100 Percent<br/>of Poverty Line .....</b>        | 904                  | 937   | 903   | 631  | 1,005  |
| <b>Below 125 Percent<br/>of Poverty Line .....</b>        | 918                  | 938   | 909   | 625  | 1,030  |
| <b>Assistance for Heating in Winter</b>                   |                      |   |       |  |  |
| Yes .....   | 957                  | 978   | 954   | 588  | 1,070  |
| No .....  | 1,086                | 1,079   | 1,107 | 780  | 1,271  |
| <b>Assistance for Weatherization of<br/>Residence</b>     |                      |   |       |  |  |
| Yes .....   | 950                  | 967   | Q     | 588  | 1,015  |
| No .....  | 1,081                | 1,074   | 1,103 | 780  | 1,180  |
| <b>Household Owns or Has Regular<br/>Use of a Vehicle</b> |                      |   |       |  |  |
| Yes .....   | 1,109                | 1,100   | 1,128 | 798  | 1,148  |
| No .....  | 873                  | 885   | 773   | 624  | 1,262  |
| <b>Race of Householder</b>                                |                      |   |       |  |  |
| White .....   | 1,087                | 1,082   | 1,099 | 775  | 1,269  |
| Black .....   | 1,097                | 1,091   | 1,175 | 708  | 1,291  |
| Other .....   | 832                  | 790   | 1,000 | 809  | 887  |
| <b>Householder of Hispanic Descent</b>                    |                      |   |       |  |  |
| Yes .....   | 977                  | 869   | 1,333 | 841  | 1,098  |
| No .....  | 1,086                | 1,086   | 1,091 | 769  | 1,270  |

See footnotes at end of table.

**Table 12. Energy Expenditures per Household for All Major Fuels, 1987 (Continued)**

| Household Characteristics                  | Average Total Fuel Expenditure<br>(dollars per household) |                                  |                                  |                       |                          |   | RSE Row Factors                              |
|--|---|----------------------------------|----------------------------------|-----------------------|--------------------------|---|--|
|  |   | In Households Where:             |                                  |                       |                          |   |  |
|  |   | Main Heating Fuel is Natural Gas | Main Heating Fuel is Electricity | With Air Conditioning | Without Air Conditioning | Main Heating Fuel is Fuel Oil or Kerosene | Main Heating Fuel is Liquefied Petroleum Gas |
| RSE Column Factors:                        | 0.451   | 0.578                            | 1.168                            | 2.231                 | 1.012                    | 1.432                                     |  |
| <b>Age of Householder</b>                  |   |                                  |                                  |                       |                          |   |  |
| Under 25 Years .....                       | 836   | 809                              | 846                              | 577                   | 1,211                    | 905                                       | 6.55   |
| 25 to 34 Years .....                       | 1,016   | 1,011                            | 1,013                            | 757                   | 1,171                    | 1,231                                     | 3.81   |
| 35 to 44 Years .....                       | 1,180   | 1,142                            | 1,240                            | 960                   | 1,407                    | 1,216                                     | 3.56   |
| 45 to 59 Years .....                       | 1,235   | 1,264                            | 1,296                            | 837                   | 1,461                    | 1,173                                     | 3.89   |
| 60 Years and Over .....                    | 1,010   | 1,008                            | 1,019                            | 706                   | 1,130                    | 1,138                                     | 4.14   |
| <b>Household Size</b>                      |   |                                  |                                  |                       |                          |   |  |
| 1 Person .....                             | 769   | 775                              | 749                              | 557                   | 883                      | 972                                       | 4.35   |
| 2 Persons .....                            | 1,040   | 1,042                            | 1,070                            | 711                   | 1,214                    | 1,085                                     | 3.31   |
| 3 Persons .....                            | 1,188   | 1,150                            | 1,275                            | 1,067                 | 1,416                    | 1,298                                     | 3.89   |
| 4 Persons .....                            | 1,324   | 1,315                            | 1,392                            | 1,151                 | 1,492                    | 1,386                                     | 4.17   |
| 5 Persons .....                            | 1,369   | 1,357                            | 1,553                            | Q                     | 1,588                    | 1,198                                     | 4.45   |
| 6 or More Persons .....                    | 1,452   | 1,420                            | 1,695                            | 1,216                 | 1,871                    | 1,479                                     | 9.13   |
| <b>Secondary Heating</b>                   |   |                                  |                                  |                       |                          |   |  |
| Yes .....                                  | 1,195   | 1,205                            | 1,296                            | 860                   | 1,406                    | 1,190                                     | 3.37   |
| Over 33 Percent of Home's Total Heat ..... | 1,127   | 1,006                            | 1,390                            | 812                   | 1,470                    | 921                                       | 9.26   |
| No .....                                   | 999   | 997                              | 969                              | 708                   | 1,160                    | 1,132                                     | 2.97   |

NC No cases in sample.

— Data not applicable.

Q Data withheld because fewer than 10 households were sampled, or, if the statistic is a median, fewer than 25 households were sampled. See Appendix C for a method for calculating RSE's for statistics in this table.

Notes: • Because of rounding, data may not sum to totals. • Percentages are calculated on unrounded numbers. • See "Glossary" for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Forms EIA-457 A, B, C, D, E, F, G of the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).

**Table 13. Household Energy Expenditures as a Percent of Income by Main Heating Fuel, 1987**

| Household Characteristics           | Expenditure as a Percent of Income<br>(median percent) |                                  |                                  |                       |                          |   |  |
|-------------------------------------|--|----------------------------------|----------------------------------|-----------------------|--------------------------|---|--|
|                                     | In All Households                                      | Main Heating Fuel is Natural Gas | In Households Where:             |                       |                          | Main Heating Fuel is Fuel Oil or Kerosene | Main Heating Fuel is Liquefied Petroleum Gas |
|                                     |  |                                  | Main Heating Fuel is Electricity | With Air Conditioning | Without Air Conditioning |   |  |
| Total U.S. Households .....         | 4  | 4                                | 4                                | 4                     | 4                        | 5   | 7  |
| <b>Census Region and Division</b>   |  |                                  |                                  |                       |                          |   |  |
| Northeast .....                     | 5  | 5                                | 3                                | 5                     | 5                        | 5   | Q  |
| New England .....                   | 4  | 4                                | 3                                | Q                     | 5                        | 5   | Q  |
| Middle Atlantic .....               | 5  | 5                                | 3                                | Q                     | 5                        | 5   | Q  |
| Midwest .....                       | 5  | 5                                | 4                                | Q                     | 5                        | 5   | 7  |
| East North Central .....            | 5  | 5                                | 5                                | Q                     | 5                        | 5   | 7  |
| West North Central .....            | 5  | 4                                | 4                                | Q                     | 6                        | 6   | 6  |
| South .....                         | 5  | 5                                | 4                                | 6                     | 7                        | 7   | 8  |
| South Atlantic .....                | 5  | 4                                | 4                                | 6                     | 7                        | 7   | 6  |
| East South Central .....            | 5  | 5                                | 4                                | Q                     | Q                        | 8   | 8  |
| West South Central .....            | 5  | 5                                | 4                                | Q                     | Q                        | Q   | Q  |
| West .....                          | 3  | 3                                | 3                                | 2                     | Q                        | Q   | 4  |
| Mountain .....                      | 4  | 4                                | 3                                | Q                     | Q                        | Q   | Q  |
| Pacific .....                       | 2  | 2                                | 3                                | 2                     | Q                        | Q   | Q  |
| <b>Metropolitan Status</b>          |  |                                  |                                  |                       |                          |   |  |
| Metropolitan .....                  | 4  | 4                                | 3                                | 3                     | 5                        | 5   | 6  |
| Central City .....                  | 4  | 5                                | 3                                | 4                     | 6                        | 6   | Q  |
| Outside Central City .....          | 4  | 4                                | 4                                | 3                     | 5                        | 5   | 6  |
| Nonmetropolitan .....               | 6  | 6                                | 5                                | 6                     | 7                        | 7   | 7  |
| <b>Climate Zone</b>                 |  |                                  |                                  |                       |                          |   |  |
| Under 2,000 CDD and--               |  |                                  |                                  |                       |                          |   |  |
| Over 7,000 HDD .....                | 5  | 4                                | Q                                | 5                     | 5                        | 5   | 6  |
| 5,500 to 7,000 HDD .....            | 4  | 5                                | 3                                | 4                     | 5                        | 5   | 9  |
| 4,000 to 5,499 HDD .....            | 4  | 4                                | 3                                | 3                     | 5                        | 5   | 6  |
| Under 4,000 HDD .....               | 4  | 3                                | 4                                | 3                     | 11                       | 11  | 8  |
| 2,000 CDD or More and --            |  |                                  |                                  |                       |                          |   |  |
| Under 4,000 HDD .....               | 5  | 5                                | 4                                | Q                     | Q                        | Q   | 7  |
| <b>Payment Method for Utilities</b> |  |                                  |                                  |                       |                          |   |  |
| All Paid by Household .....         | 4  | 4                                | 4                                | 4                     | 5                        | 5   | 7  |
| Some Paid, Some in Rent .....       | 4  | 4                                | 2                                | 4                     | 5                        | 5   | Q  |
| All Included in Rent .....          | 6  | 6                                | 7                                | 6                     | 6                        | 6   | Q  |
| Other Method .....                  | 4  | 4                                | Q                                | Q                     | 6                        | 6   | Q  |

See footnotes at end of table.

**Table 13. Household Energy Expenditures as a Percent of Income by Main Heating Fuel, 1987 (Continued)**

| Household Characteristics                              | In All Households | Expenditure as a Percent of Income<br>(median percent) |   |                       |                          |   |
|--|-------------------|--|---|-----------------------|--------------------------|---|
|  |                   | In Households Where:                                   |   |                       |                          | Main Heating Fuel is<br>Fuel Oil or<br>Kerosene |
|  |                   | Main Heating Fuel is Electricity                       |   | With Air Conditioning | Without Air Conditioning |   |
| <b>Housing Structure by Status of Unit</b>             |                   |  |   |                       |                          |   |
| Single-Family Detached .....                           | 4                 | 4  | 4 | 4                     | 4                        | 5   |
| Owned .....  | 4                 | 4  | 4 | 4                     | 4                        | 5   |
| Rented .....   | 6                 | 6  | 4 | Q                     | Q                        | 6   |
| Single-Family Attached .....                           | 4                 | 4  | 3 | Q                     | Q                        | 7   |
| Owned .....  | 3                 | 3  | 3 | Q                     | Q                        | 7   |
| Rented .....   | 4                 | 4  | Q | Q                     | Q                        | NC  |
| Building of 2 to 4 Units .....                         | 5                 | 5  | 5 | 5                     | 5                        | 5   |
| Owned .....  | 5                 | 4  | Q | Q                     | Q                        | 6   |
| Rented .....   | 5                 | 5  | 5 | 4                     | 4                        | 5   |
| Building of 5 or More Units .....                      | 4                 | 4  | 3 | 2                     | 2                        | 4   |
| Owned .....  | 2                 | Q  | Q | Q                     | Q                        | NC  |
| Rented .....   | 4                 | 4  | 4 | 2                     | 2                        | 4   |
| Mobile Home .....                                      | 6                 | 6  | 6 | Q                     | Q                        | 8   |
| Owned .....  | 6                 | 5  | 6 | Q                     | Q                        | 6   |
| Rented .....   | 8                 | 6  | Q | Q                     | Q                        | Q   |
| <b>Number of Rooms</b>                                 |                   |  |   |                       |                          |   |
| 1 .....  | 4                 | 4  | Q | Q                     | Q                        | Q   |
| 2 .....  | 4                 | 3  | 4 | Q                     | Q                        | Q   |
| 3 .....  | 4                 | 5  | 4 | 4                     | 5                        | 7   |
| 4 .....  | 5                 | 5  | 5 | 4                     | 6                        | 6   |
| 5 .....  | 5                 | 5  | 4 | 3                     | 6                        | 8   |
| 6 .....  | 4                 | 4  | 4 | Q                     | 5                        | 7   |
| 7 .....  | 4                 | 4  | 3 | Q                     | 5                        | 5   |
| 8 or More .....  | 3                 | 3  | 4 | Q                     | 4                        | 4   |
| <b>Number of Rooms That Can Be Air Conditioned</b>     |                   |  |   |                       |                          |   |
| All .....  | 4                 | 4  | 4 | NC                    | 4                        | 6   |
| Some .....   | 5                 | 4  | 5 | NC                    | 5                        | 8   |
| None .....   | 5                 | 4  | — | 4                     | 6                        | 7   |
| <b>Measured Heated Area of Residence (square feet)</b> |                   |  |   |                       |                          |   |
| Fewer than 600 .....                                   | 5                 | 6  | 4 | 4                     | 6                        | 8   |
| 600 to 999 .....                                       | 5                 | 5  | 4 | 4                     | 6                        | 7   |
| 1,000 to 1,599 .....                                   | 4                 | 4  | 4 | 3                     | 6                        | 8   |
| 1,600 to 1,999 .....                                   | 4                 | 4  | 4 | 5                     | 5                        | 6   |
| 2,000 to 2,399 .....                                   | 4                 | 3  | 3 | Q                     | 5                        | Q   |
| 2,400 to 2,999 .....                                   | 4                 | 4  | 3 | Q                     | 4                        | Q   |
| 3,000 or More .....                                    | 3                 | 3  | 4 | Q                     | 4                        | Q   |
| <b>Year of Construction</b>                            |                   |  |   |                       |                          |   |
| 1939 or Before .....                                   | 6                 | 6  | 5 | 4                     | 6                        | 6   |
| 1940 to 1949 .....                                     | 4                 | 4  | 3 | Q                     | 5                        | Q   |
| 1950 to 1959 .....                                     | 4                 | 4  | 5 | Q                     | 5                        | 7   |
| 1960 to 1969 .....                                     | 4                 | 4  | 5 | 4                     | 5                        | 7   |
| 1970 to 1974 .....                                     | 4                 | 4  | 5 | 3                     | 6                        | 7   |
| 1975 to 1979 .....                                     | 4                 | 4  | 3 | 4                     | 4                        | 8   |
| 1980 to 1984 .....                                     | 3                 | 3  | 4 | 3                     | Q                        | Q   |
| 1985 or After .....                                    | 3                 | 3  | 3 | Q                     | Q                        | Q   |

See footnotes at end of table.

**Table 13. Household Energy Expenditures as a Percent of Income by Main Heating Fuel, 1987 (Continued)**

| Household Characteristics                             | In All Households | Expenditure as a Percent of Income<br>(median percent) |                       |                          |                                  |   |
|---|-------------------|--|-----------------------|--------------------------|----------------------------------|---|
|   |                   | Main Heating Fuel Is Natural Gas                       | In Households Where:  |                          |                                  | Main Heating Fuel Is Fuel Oil or Kerosene |
|   |                   |  | With Air Conditioning | Without Air Conditioning | Main Heating Fuel Is Electricity |   |
| <b>Status of Unit</b>                                 |                   |  |                       |                          |                                  |   |
| Owned .....   | 4                 | 4  | 4                     | 4                        | 5                                | 7   |
| Condominium .....                                     | 2                 | 2  | 2                     | Q                        | Q                                | NC  |
| Not a Condominium .....                               | 4                 | 4  | 4                     | 4                        | 5                                | 7   |
| Rented .....  | 5                 | 5  | 4                     | 3                        | 5                                | 8   |
| Public Housing .....                                  | 9                 | 9  | 9                     | 8                        | 6                                | NC  |
| Not Public Housing .....                              | 4                 | 4  | 4                     | 3                        | 5                                | 8   |
| Rent Subsidy .....                                    | 11                | 14   | Q                     | Q                        | Q                                | Q   |
| No Rent Subsidy .....                                 | 4                 | 4  | 4                     | 3                        | 5                                | 8   |
| <b>1987 Family Income</b>                             |                   |  |                       |                          |                                  |   |
| Less than \$5,000 .....                               | 25                | 25   | 27                    | 13                       | 24                               | 31  |
| \$5,000 to \$9,999 .....                              | 11                | 11   | 10                    | 8                        | 13                               | 11  |
| \$10,000 to \$14,999 .....                            | 7                 | 7  | 7                     | 5                        | 9                                | 8   |
| \$15,000 to \$19,999 .....                            | 5                 | 5  | 5                     | 4                        | 6                                | 7   |
| \$20,000 to \$24,999 .....                            | 4                 | 4  | 5                     | 3                        | 5                                | 6   |
| \$25,000 to \$34,999 .....                            | 3                 | 3  | 3                     | 2                        | 4                                | 4   |
| \$35,000 to \$49,999 .....                            | 3                 | 3  | 3                     | Q                        | 3                                | Q   |
| \$50,000 or More .....                                | 2                 | 2  | 2                     | 1                        | 2                                | Q   |
| <b>Below 100 Percent of Poverty Line</b>              |                   |  |                       |                          |                                  |   |
| .....   | 16                | 16   | 19                    | 12                       | 18                               | 23  |
| <b>Below 125 Percent of Poverty Line</b>              |                   |  |                       |                          |                                  |   |
| .....   | 13                | 13   | 13                    | 10                       | 14                               | 17  |
| <b>Assistance for Heating in Winter</b>               |                   |  |                       |                          |                                  |   |
| Yes .....   | 13                | 14   | 13                    | Q                        | 15                               | 18  |
| No .....  | 4                 | 4  | 4                     | 4                        | 5                                | 6   |
| <b>Assistance for Weatherization of Residence</b>     |                   |  |                       |                          |                                  |   |
| Yes .....   | 11                | 13   | Q                     | Q                        | Q                                | Q   |
| No .....  | 4                 | 4  | 4                     | 4                        | 5                                | 7   |
| <b>Household Owns or Has Regular Use of a Vehicle</b> |                   |  |                       |                          |                                  |   |
| Yes .....   | 4                 | 4  | 4                     | 4                        | 5                                | 6   |
| No .....  | 10                | 11   | 8                     | 8                        | 8                                | Q   |
| <b>Race of Householder</b>                            |                   |  |                       |                          |                                  |   |
| White .....   | 4                 | 4  | 4                     | 4                        | 5                                | 6   |
| Black .....   | 7                 | 7  | 5                     | 11                       | 8                                | 13  |
| Other .....   | 3                 | 3  | Q                     | Q                        | 4                                | Q   |
| <b>Householder of Hispanic Descent</b>                |                   |  |                       |                          |                                  |   |
| Yes .....   | 4                 | 4  | 3                     | Q                        | 6                                | Q   |
| No .....  | 4                 | 4  | 4                     | 4                        | 5                                | 7   |

See footnotes at end of table.

**Table 13. Household Energy Expenditures as a Percent of Income by Main Heating Fuel, 1987 (Continued)**

| Household Characteristics                  | In All Households | Expenditure as a Percent of Income<br>(median percent) |                       |                          |                                  |   |
|--|-------------------|--|-----------------------|--------------------------|----------------------------------|---|
|  |                   | Main Heating Fuel is Natural Gas                       | In Households Where:  |                          |                                  | Main Heating Fuel is Fuel Oil or Kerosene |
|  |                   |  | With Air Conditioning | Without Air Conditioning | Main Heating Fuel is Electricity |   |
| <b>Age of Householder</b>                  |                   |  |                       |                          |                                  |   |
| Under 25 Years .....                       | 5                 | 5  | 4                     | 3                        | 6                                | Q   |
| 25 to 34 Years .....                       | 4                 | 4  | 3                     | 3                        | 4                                | 6   |
| 35 to 44 Years .....                       | 4                 | 3  | 3                     | 3                        | 5                                | 8   |
| 45 to 59 Years .....                       | 4                 | 4  | 4                     | 3                        | 4                                | 6   |
| 60 Years and Over .....                    | 6                 | 6  | 7                     | 6                        | 7                                | 8   |
| <b>Household Size</b>                      |                   |  |                       |                          |                                  |   |
| 1 Person .....                             | 5                 | 5  | 3                     | 4                        | 7                                | 10  |
| 2 Persons .....                            | 4                 | 4  | 3                     | 3                        | 4                                | 7   |
| 3 Persons .....                            | 4                 | 4  | 4                     | 5                        | 5                                | 6   |
| 4 Persons .....                            | 4                 | 4  | 3                     | 4                        | 5                                | 4   |
| 5 Persons .....                            | 5                 | 5  | 4                     | Q                        | 5                                | Q   |
| 6 or More Persons .....                    | 5                 | 5  | Q                     | Q                        | 7                                | Q   |
| <b>Secondary Heating</b>                   |                   |  |                       |                          |                                  |   |
| Yes .....                                  | 4                 | 4  | 3                     | 3                        | 5                                | 6   |
| Over 33 Percent of Home's Total Heat ..... | 4                 | 3  | 4                     | Q                        | 6                                | Q   |
| No .....                                   | 5                 | 5  | 4                     | 5                        | 6                                | 7   |

NC No cases in sample.

-- Data not applicable.

Q Data withheld because fewer than 10 households were sampled, or, if the statistic is a median, fewer than 25 households were sampled. See Appendix C for a method for calculating RSE's for statistics in this table.

Notes: • Because of rounding, data may not sum to totals. • Percentages are calculated on unrounded numbers. • Relative Standard Error (RSE) row and column factors were not calculated on any table that presented a median value. • See "Glossary" for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Forms EIA-457 A, B, C, D, E, F, G of the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).

**Table 14. Household Natural Gas Consumption and Expenditures, 1987**

| Household Characteristics                  | Natural Gas Used:              |                                     |   |                                      |   |                                       |                                       | RSE Row Factors |
|--|--------------------------------|-------------------------------------|---|--------------------------------------|---|---------------------------------------|---------------------------------------|-----------------|
|  | Number of Households (million) | Total Amount Consumed (trillion cf) | Total Amount Consumed (quadrillion Btu) | Total Expenditures (billion dollars) | Average Price (dollars per thousand cf) | Average Amount Consumed (thousand cf) | Average Amount Consumed (million Btu) |                 |
| RSE Column Factors:                        | 1.304                          | 1.629                               | 1.529                                   | 1.534                                | 0.384                                   | 0.812                                 | 0.812                                 | 0.844           |
| <b>Total U.S. Households</b>               | 57.3                           | 4.69                                | 4.83                                    | 26.1                                 | 5.58                                    | 81.8                                  | 84.3                                  | 456             |
| <b>Census Region and Division</b>          |                                |                                     |   |                                      |   |                                       |                                       |                 |
| Northeast                                  | 11.7                           | 1.00                                | 1.03                                    | 6.7                                  | 6.65                                    | 85.9                                  | 88.5                                  | 571             |
| New England                                | 1.7                            | .14                                 | .15                                     | 1.0                                  | 6.96                                    | 84.2                                  | 86.8                                  | 586             |
| Middle Atlantic                            | 10.0                           | .86                                 | .89                                     | 5.7                                  | 6.60                                    | 86.1                                  | 88.8                                  | 568             |
| Midwest                                    | 17.1                           | 1.77                                | 1.83                                    | 9.0                                  | 5.08                                    | 103.5                                 | 106.8                                 | 526             |
| East North Central                         | 12.2                           | 1.31                                | 1.35                                    | 6.8                                  | 5.17                                    | 107.1                                 | 110.5                                 | 553             |
| West North Central                         | 4.9                            | .46                                 | .48                                     | 2.2                                  | 4.83                                    | 94.6                                  | 97.5                                  | 457             |
| South                                      | 15.1                           | 1.06                                | 1.09                                    | 6.1                                  | 5.70                                    | 70.1                                  | 72.3                                  | 400             |
| South Atlantic                             | 5.9                            | .44                                 | .45                                     | 2.9                                  | 6.71                                    | 74.7                                  | 77.0                                  | 501             |
| East South Central                         | 2.5                            | .18                                 | .19                                     | .9                                   | 5.07                                    | 73.8                                  | 76.1                                  | 374             |
| West South Central                         | 6.8                            | .44                                 | .45                                     | 2.2                                  | 4.96                                    | 64.8                                  | 66.9                                  | 322             |
| West                                       | 13.4                           | .85                                 | .88                                     | 4.4                                  | 5.21                                    | 63.5                                  | 65.5                                  | 331             |
| Mountain                                   | 3.5                            | .30                                 | .31                                     | 1.4                                  | 4.69                                    | 87.5                                  | 90.2                                  | 410             |
| Pacific                                    | 9.9                            | .55                                 | .56                                     | 3.0                                  | 5.50                                    | 55.1                                  | 56.8                                  | 303             |
| <b>Metropolitan Status</b>                 |                                |                                     |   |                                      |   |                                       |                                       |                 |
| Metropolitan                               | 48.7                           | 3.95                                | 4.07                                    | 22.3                                 | 5.64                                    | 81.1                                  | 83.6                                  | 457             |
| Central City                               | 23.3                           | 1.85                                | 1.91                                    | 10.5                                 | 5.65                                    | 79.5                                  | 81.9                                  | 449             |
| Outside Central City                       | 25.4                           | 2.10                                | 2.16                                    | 11.8                                 | 5.63                                    | 82.6                                  | 85.1                                  | 465             |
| Nonmetropolitan                            | 8.6                            | .74                                 | .76                                     | 3.9                                  | 5.26                                    | 85.6                                  | 88.3                                  | 450             |
| <b>Climate Zone</b>                        |                                |                                     |   |                                      |   |                                       |                                       |                 |
| Under 2,000 CDD and--                      |                                |                                     |   |                                      |   |                                       |                                       |                 |
| Over 7,000 HDD                             | 4.2                            | .40                                 | .42                                     | 2.1                                  | 5.18                                    | 97.1                                  | 100.1                                 | 503             |
| 5,500 to 7,000 HDD                         | 19.1                           | 2.03                                | 2.09                                    | 10.6                                 | 5.22                                    | 106.2                                 | 109.5                                 | 555             |
| 4,000 to 5,499 HDD                         | 13.1                           | 1.06                                | 1.09                                    | 6.6                                  | 6.26                                    | 80.6                                  | 83.1                                  | 505             |
| Under 4,000 HDD                            | 12.2                           | .71                                 | .73                                     | 4.1                                  | 5.80                                    | 57.9                                  | 59.7                                  | 336             |
| 2,000 CDD or More and --                   |                                |                                     |   |                                      |   |                                       |                                       |                 |
| Under 4,000 HDD                            | 8.8                            | .49                                 | .51                                     | 2.8                                  | 5.59                                    | 56.4                                  | 58.1                                  | 315             |
| <b>All Gas Paid by Household</b>           |                                |                                     |   |                                      |   |                                       |                                       |                 |
| Yes  | 44.3                           | 3.91                                | 4.03                                    | 21.7                                 | 5.54                                    | 88.3                                  | 91.1                                  | 490             |
| Budget Plan                                | 7.6                            | .89                                 | .91                                     | 5.0                                  | 5.62                                    | 116.1                                 | 119.7                                 | 652             |
| No Budget Plan                             | 36.6                           | 3.02                                | 3.12                                    | 16.7                                 | 5.52                                    | 82.5                                  | 85.1                                  | 456             |
| No   | 13.1                           | .78                                 | .80                                     | 4.5                                  | 5.76                                    | 59.6                                  | 61.4                                  | 343             |
| <b>Housing Structure by Status of Unit</b> |                                |                                     |   |                                      |   |                                       |                                       |                 |
| Single-Family Detached                     | 33.6                           | 3.20                                | 3.30                                    | 17.5                                 | 5.47                                    | 95.3                                  | 98.2                                  | 521             |
| Owned                                      | 28.9                           | 2.78                                | 2.86                                    | 15.2                                 | 5.48                                    | 96.2                                  | 99.2                                  | 527             |
| Rented                                     | 4.7                            | .42                                 | .43                                     | 2.3                                  | 5.41                                    | 89.5                                  | 92.2                                  | 484             |
| Single-Family Attached                     | 3.5                            | .28                                 | .29                                     | 1.7                                  | 6.16                                    | 80.3                                  | 82.8                                  | 495             |
| Owned                                      | 2.6                            | .22                                 | .23                                     | 1.4                                  | 6.27                                    | 84.6                                  | 87.2                                  | 531             |
| Rented                                     | .9                             | .06                                 | .06                                     | .4                                   | 5.75                                    | 67.8                                  | 69.9                                  | 390             |
| Building of 2 to 4 Units                   | 8.0                            | .59                                 | .61                                     | 3.4                                  | 5.83                                    | 74.1                                  | 76.4                                  | 431             |
| Owned                                      | 1.7                            | .15                                 | .15                                     | .9                                   | 5.91                                    | 87.1                                  | 89.8                                  | 515             |
| Rented                                     | 6.3                            | .45                                 | .46                                     | 2.6                                  | 5.80                                    | 70.6                                  | 72.8                                  | 409             |
| Building of 5 or More Units                | 10.5                           | .49                                 | .51                                     | 2.8                                  | 5.73                                    | 47.0                                  | 48.5                                  | 269             |
| Owned                                      | .6                             | .03                                 | .03                                     | .2                                   | 5.71                                    | 47.1                                  | 48.6                                  | 269             |
| Rented                                     | 9.8                            | .46                                 | .48                                     | 2.7                                  | 5.73                                    | 47.0                                  | 48.5                                  | 269             |
| Mobile Home                                | 1.7                            | .12                                 | .12                                     | .6                                   | 5.35                                    | 68.9                                  | 71.1                                  | 369             |
| Owned                                      | 1.4                            | .10                                 | .10                                     | .5                                   | 5.31                                    | 69.9                                  | 72.1                                  | 372             |
| Rented                                     | .3                             | .02                                 | .02                                     | .1                                   | 5.55                                    | 63.8                                  | 65.8                                  | 354             |
| <b>Number of Rooms</b>                     |                                |                                     |   |                                      |   |                                       |                                       |                 |
| 1  | .4                             | .02                                 | .02                                     | .1                                   | 5.90                                    | 45.4                                  | 46.8                                  | 268             |
| 2  | 1.6                            | .06                                 | .06                                     | .3                                   | 5.18                                    | 38.5                                  | 39.7                                  | 200             |
| 3  | 6.1                            | .28                                 | .29                                     | 1.6                                  | 5.69                                    | 46.0                                  | 47.4                                  | 262             |
| 4  | 10.6                           | .68                                 | .70                                     | 3.8                                  | 5.64                                    | 64.1                                  | 66.1                                  | 362             |
| 5  | 13.2                           | 1.04                                | 1.07                                    | 5.7                                  | 5.54                                    | 78.3                                  | 80.7                                  | 433             |
| 6  | 11.6                           | 1.06                                | 1.09                                    | 5.9                                  | 5.55                                    | 91.5                                  | 94.3                                  | 507             |
| 7  | 7.2                            | .74                                 | .76                                     | 4.2                                  | 5.63                                    | 102.3                                 | 105.4                                 | 576             |
| 8 or More                                  | 6.5                            | .81                                 | .83                                     | 4.5                                  | 5.56                                    | 124.1                                 | 128.0                                 | 690             |

See footnotes at end of table.

**Table 14. Household Natural Gas Consumption and Expenditures, 1987 (Continued)**

| Household Characteristics<br>RSE Column Factors        | Natural Gas Used:              |                                     |   |   |                                       |                                       |  | RSE<br>Row<br>Factors |  |
|--|--------------------------------|-------------------------------------|---|---|---------------------------------------|---------------------------------------|--|-----------------------|--|
|  | Number of Households (million) | Total Amount Consumed (trillion cf) | Total Amount Consumed (quadrillion Btu) | Average Price (dollars per thousand cf) | Average Amount Consumed (thousand cf) | Average Amount Consumed (million Btu) | Average Expenses per Household (dollars) |                       |  |
|  |                                |                                     |   |   |                                       |                                       |  |                       |  |
| <b>Number of Rooms That Can Be Air Conditioned</b>     |                                |                                     |   |   |                                       |                                       |  |                       |  |
| All .....  | 24.9                           | 1.94                                | 2.00                                    | 10.7                                    | 5.49                                  | 78.0                                  | 80.4                                     | 428                   |  |
| Some .....   | 11.7                           | 1.03                                | 1.06                                    | 6.0                                     | 5.79                                  | 87.9                                  | 90.6                                     | 509                   |  |
| None .....   | 20.7                           | 1.72                                | 1.77                                    | 9.5                                     | 5.55                                  | 82.8                                  | 85.4                                     | 460                   |  |
| <b>Measured Heated Area of Residence (square feet)</b> |                                |                                     |   |   |                                       |                                       |  |                       |  |
| Fewer than 600 .....                                   | 5.3                            | .25                                 | .26                                     | 1.4                                     | 5.76                                  | 47.4                                  | 48.6                                     | 273                   |  |
| 600 to 999 .....                                       | 15.4                           | .98                                 | 1.01                                    | 5.5                                     | 5.59                                  | 63.5                                  | 65.4                                     | 355                   |  |
| 1,000 to 1,599 .....                                   | 14.9                           | 1.14                                | 1.17                                    | 6.3                                     | 5.56                                  | 76.2                                  | 78.5                                     | 423                   |  |
| 1,600 to 1,999 .....                                   | 7.2                            | .67                                 | .69                                     | 3.8                                     | 5.64                                  | 92.8                                  | 95.7                                     | 524                   |  |
| 2,000 to 2,399 .....                                   | 5.9                            | .61                                 | .62                                     | 3.4                                     | 5.58                                  | 102.8                                 | 106.0                                    | 574                   |  |
| 2,400 to 2,999 .....                                   | 5.3                            | .62                                 | .64                                     | 3.4                                     | 5.54                                  | 117.6                                 | 121.2                                    | 652                   |  |
| 3,000 or More .....                                    | 3.3                            | .43                                 | .44                                     | 2.3                                     | 5.46                                  | 128.4                                 | 132.3                                    | 700                   |  |
| <b>Year of Construction</b>                            |                                |                                     |   |   |                                       |                                       |  |                       |  |
| 1929 or Before .....                                   | 15.7                           | 1.48                                | 1.53                                    | 8.4                                     | 5.70                                  | 94.5                                  | 97.4                                     | 539                   |  |
| 1940 to 1949 .....                                     | 6.0                            | .47                                 | .48                                     | 2.7                                     | 5.77                                  | 77.7                                  | 80.1                                     | 449                   |  |
| 1950 to 1959 .....                                     | 9.1                            | .76                                 | .79                                     | 4.2                                     | 5.50                                  | 83.5                                  | 86.1                                     | 459                   |  |
| 1960 to 1969 .....                                     | 11.9                           | .89                                 | .92                                     | 5.1                                     | 5.67                                  | 75.4                                  | 77.7                                     | 427                   |  |
| 1970 to 1974 .....                                     | 5.8                            | .47                                 | .49                                     | 2.5                                     | 5.34                                  | 81.2                                  | 83.7                                     | 433                   |  |
| 1975 to 1979 .....                                     | 4.7                            | .33                                 | .34                                     | 1.7                                     | 5.15                                  | 70.1                                  | 72.2                                     | 361                   |  |
| 1980 to 1984 .....                                     | 3.0                            | .19                                 | .20                                     | 1.1                                     | 5.50                                  | 63.6                                  | 65.5                                     | 350                   |  |
| 1985 or After .....                                    | 1.2                            | .10                                 | .10                                     | .5                                      | 5.41                                  | 79.6                                  | 82.0                                     | 430                   |  |
| <b>Status of Unit</b>                                  |                                |                                     |   |   |                                       |                                       |  |                       |  |
| Owned .....  | 35.3                           | 3.28                                | 3.38                                    | 18.2                                    | 5.55                                  | 92.9                                  | 95.8                                     | 516                   |  |
| Condominium .....                                      | 1.0                            | .06                                 | .06                                     | .3                                      | 5.19                                  | 59.3                                  | 61.1                                     | 308                   |  |
| Not a Condominium .....                                | 34.3                           | 3.22                                | 3.32                                    | 17.9                                    | 5.55                                  | 98.9                                  | 96.8                                     | 522                   |  |
| Rented .....   | 22.0                           | 1.41                                | 1.45                                    | 8.0                                     | 5.65                                  | 63.9                                  | 65.9                                     | 361                   |  |
| Public Housing .....                                   | 1.8                            | .10                                 | .10                                     | .6                                      | 5.85                                  | 54.0                                  | 55.7                                     | 316                   |  |
| Not Public Housing .....                               | 20.2                           | 1.31                                | 1.35                                    | 7.4                                     | 5.64                                  | 64.8                                  | 66.8                                     | 365                   |  |
| Rent Subsidy .....                                     | .9                             | .06                                 | .06                                     | .4                                      | 6.40                                  | 66.3                                  | 68.4                                     | 424                   |  |
| No Rent Subsidy .....                                  | 19.3                           | 1.25                                | 1.29                                    | 7.0                                     | 5.60                                  | 64.7                                  | 66.7                                     | 363                   |  |
| <b>1987 Family Income</b>                              |                                |                                     |   |   |                                       |                                       |  |                       |  |
| Less than \$5,000 .....                                | 3.8                            | .29                                 | .30                                     | 1.6                                     | 5.56                                  | 75.6                                  | 78.0                                     | 421                   |  |
| \$5,000 to \$9,999 .....                               | 7.4                            | .55                                 | .57                                     | 3.0                                     | 5.50                                  | 75.2                                  | 77.5                                     | 413                   |  |
| \$10,000 to \$14,999 .....                             | 8.0                            | .60                                 | .62                                     | 3.3                                     | 5.54                                  | 75.1                                  | 77.4                                     | 416                   |  |
| \$15,000 to \$19,999 .....                             | 5.6                            | .43                                 | .45                                     | 2.4                                     | 5.57                                  | 76.4                                  | 78.8                                     | 426                   |  |
| \$20,000 to \$24,999 .....                             | 5.3                            | .40                                 | .42                                     | 2.2                                     | 5.41                                  | 76.9                                  | 79.3                                     | 416                   |  |
| \$25,000 to \$29,999 .....                             | 9.9                            | .79                                 | .81                                     | 4.4                                     | 5.63                                  | 79.2                                  | 81.7                                     | 446                   |  |
| \$35,000 to \$49,999 .....                             | 8.3                            | .75                                 | .77                                     | 4.2                                     | 5.60                                  | 90.9                                  | 93.7                                     | 509                   |  |
| \$50,000 or More .....                                 | 9.0                            | .87                                 | .90                                     | 4.9                                     | 5.68                                  | 96.3                                  | 99.3                                     | 547                   |  |
| <b>Below 100 Percent of Poverty Line</b>               |                                |                                     |   |   |                                       |                                       |  |                       |  |
| Below 125 Percent of Poverty Line .....                | .74                            | .58                                 | .60                                     | 3.3                                     | 5.60                                  | 78.3                                  | 80.8                                     | 438                   |  |
| <b>Assistance for Heating in Winter</b>                |                                |                                     |   |   |                                       |                                       |  |                       |  |
| Yes .....  | 3.1                            | .28                                 | .28                                     | 1.5                                     | 5.59                                  | 90.2                                  | 93.0                                     | 505                   |  |
| No .....   | 54.3                           | 4.41                                | 4.55                                    | 24.6                                    | 5.58                                  | 81.3                                  | 83.8                                     | 454                   |  |
| <b>Assistance for Weatherization of Residence</b>      |                                |                                     |   |   |                                       |                                       |  |                       |  |
| Yes .....  | .7                             | .06                                 | .06                                     | .3                                      | 5.55                                  | 88.0                                  | 90.7                                     | 488                   |  |
| No .....   | 56.7                           | 4.63                                | 4.77                                    | 25.8                                    | 5.58                                  | 81.7                                  | 84.2                                     | 456                   |  |
|  |                                |                                     |   |   |                                       |                                       |  |                       |  |
| See footnotes at end of table.                         |                                |                                     |   |   |                                       |                                       |  |                       |  |

**Table 14. Household Natural Gas Consumption and Expenditures, 1987 (Continued)**

| Household Characteristics                             | Natural Gas Used:              |                                     |   |                                      |   |                                       |                                       |  | RSE Row Factors |
|---|--------------------------------|-------------------------------------|---|--------------------------------------|---|---------------------------------------|---------------------------------------|--|-----------------|
|   | Number of Households (million) | Total Amount Consumed (trillion cf) | Total Amount Consumed (quadrillion Btu) | Total Expenditures (billion dollars) | Average Price (dollars per thousand cf) | Average Amount Consumed (thousand cf) | Average Amount Consumed (million Btu) | Average Expenditures per Household (dollars) |                 |
| RSE Column Factors:                                   | 1.304                          | 1.529                               | 1.529                                   | 1.534                                | 0.384                                   | 0.812                                 | 0.812                                 | 0.844  |                 |
| <b>Household Owns or Has Regular Use of a Vehicle</b> |                                |                                     |   |                                      |   |                                       |                                       |  |                 |
| Yes .....   | 48.9                           | 4.09                                | 4.22                                    | 22.6                                 | 5.52                                    | 83.7                                  | 86.3                                  | 462  | 2.41            |
| No .....  | 8.4                            | .59                                 | .61                                     | 3.6                                  | 5.99                                    | 70.5                                  | 72.7                                  | 422  | 5.58            |
| <b>Race of Householder</b>                            |                                |                                     |   |                                      |   |                                       |                                       |  |                 |
| White .....   | 46.6                           | 3.83                                | 3.95                                    | 21.0                                 | 5.49                                    | 82.2                                  | 84.7                                  | 452  | 2.70            |
| Black .....   | 8.5                            | .73                                 | .75                                     | 4.4                                  | 6.05                                    | 84.8                                  | 87.5                                  | 514  | 5.27            |
| Other .....   | 2.2                            | .13                                 | .14                                     | .7                                   | 5.45                                    | 60.9                                  | 62.8                                  | 332  | 8.67            |
| <b>Householder of Hispanic Descent</b>                |                                |                                     |   |                                      |   |                                       |                                       |  |                 |
| Yes .....   | 3.7                            | .22                                 | .23                                     | 1.3                                  | 5.62                                    | 60.7                                  | 62.5                                  | 341  | 6.50            |
| No .....  | 53.6                           | 4.46                                | 4.60                                    | 24.9                                 | 5.58                                    | 83.2                                  | 85.8                                  | 464  | 2.56            |
| <b>Age of Householder</b>                             |                                |                                     |   |                                      |   |                                       |                                       |  |                 |
| Under 25 Years .....                                  | 4.1                            | .27                                 | .28                                     | 1.5                                  | 5.50                                    | 65.4                                  | 67.4                                  | 360  | 6.59            |
| 25 to 34 Years .....                                  | 13.9                           | 1.08                                | 1.11                                    | 6.0                                  | 5.55                                    | 77.1                                  | 79.5                                  | 429  | 3.87            |
| 35 to 44 Years .....                                  | 10.7                           | .93                                 | .96                                     | 5.1                                  | 5.49                                    | 86.7                                  | 89.4                                  | 476  | 3.51            |
| 45 to 59 Years .....                                  | 11.7                           | 1.07                                | 1.10                                    | 6.0                                  | 5.58                                    | 91.7                                  | 94.6                                  | 512  | 3.41            |
| 60 Years and Over .....                               | 16.8                           | 1.34                                | 1.38                                    | 7.6                                  | 5.68                                    | 79.5                                  | 82.0                                  | 452  | 3.77            |
| <b>Household Size</b>                                 |                                |                                     |   |                                      |   |                                       |                                       |  |                 |
| 1 Person .....  | 14.3                           | .96                                 | .99                                     | 5.3                                  | 5.49                                    | 67.1                                  | 69.1                                  | 368  | 4.36            |
| 2 Persons .....                                       | 18.7                           | 1.46                                | 1.51                                    | 8.1                                  | 5.57                                    | 78.1                                  | 80.5                                  | 435  | 2.77            |
| 3 Persons .....                                       | 9.7                            | .82                                 | .85                                     | 4.6                                  | 5.61                                    | 85.3                                  | 87.9                                  | 479  | 3.34            |
| 4 Persons .....                                       | 8.5                            | .83                                 | .86                                     | 4.6                                  | 5.57                                    | 97.6                                  | 100.6                                 | 543  | 4.31            |
| 5 Persons .....                                       | 4.1                            | .40                                 | .41                                     | 2.3                                  | 5.72                                    | 97.9                                  | 100.9                                 | 560  | 5.07            |
| 6 or More Persons .....                               | 2.0                            | .21                                 | .21                                     | 1.2                                  | 5.72                                    | 104.4                                 | 107.6                                 | 597  | 7.68            |
| <b>Secondary Heating</b>                              |                                |                                     |   |                                      |   |                                       |                                       |  |                 |
| Yes .....   | 20.9                           | 1.83                                | 1.89                                    | 10.1                                 | 5.49                                    | 87.7                                  | 90.4                                  | 481  | 3.18            |
| Over 33 Percent of Home's Total Heat .....            | 1.2                            | .08                                 | .09                                     | .5                                   | 5.40                                    | 70.4                                  | 72.6                                  | 380  | 7.35            |
| No .....  | 36.4                           | 2.85                                | 2.94                                    | 16.1                                 | 5.64                                    | 78.4                                  | 80.8                                  | 442  | 2.92            |
| <b>Fuel Combinations</b>                              |                                |                                     |   |                                      |   |                                       |                                       |  |                 |
| Use Natural Gas for Main Heat .....                   | 50.0                           | 4.51                                | 4.65                                    | 24.8                                 | 5.51                                    | 90.2                                  | 93.0                                  | 497  | 2.40            |
| Use Natural Gas to Heat Water and Have A/C .....      | 28.6                           | 2.62                                | 2.70                                    | 14.4                                 | 5.50                                    | 91.7                                  | 94.5                                  | 504  | 2.87            |
| and Lack A/C .....                                    | 16.3                           | 1.52                                | 1.57                                    | 8.3                                  | 5.47                                    | 93.6                                  | 96.5                                  | 512  | 3.68            |
| Use Electricity to Heat Water and Have A/C .....      | 3.4                            | .23                                 | .24                                     | 1.3                                  | 5.82                                    | 68.8                                  | 71.0                                  | 401  | 6.57            |
| and Lack A/C .....                                    | 1.6                            | .12                                 | .13                                     | .7                                   | 5.49                                    | 77.2                                  | 79.6                                  | 424  | 7.30            |
| Other .....   | .2                             | .02                                 | .02                                     | .1                                   | 6.13                                    | 61.2                                  | 63.1                                  | 375  | 20.83           |
| Use Electricity for Main Heat .....                   | 2.6                            | .05                                 | .06                                     | .3                                   | 6.14                                    | 20.9                                  | 21.5                                  | 128  | 13.70           |
| Use Fuel Oil for Main Heat .....                      | 3.7                            | .07                                 | .07                                     | .7                                   | 9.62                                    | 18.5                                  | 19.1                                  | 178  | 10.73           |
| Use Wood for Main Heat .....                          | .8                             | .04                                 | .05                                     | .3                                   | 5.66                                    | 57.9                                  | 59.6                                  | 327  | 10.34           |
| Other/None .....                                      | .2                             | .01                                 | .01                                     | .1                                   | 5.99                                    | 47.3                                  | 48.8                                  | 283  | 25.89           |
| <b>Main Heating Equipment Using Natural Gas</b>       |                                |                                     |   |                                      |   |                                       |                                       |  |                 |
| Central Warm Air Furnace .....                        | 31.6                           | 2.96                                | 3.06                                    | 15.9                                 | 5.37                                    | 93.7                                  | 96.6                                  | 503  | 3.01            |
| Steam or Hot-Water System .....                       | 9.2                            | .97                                 | 1.00                                    | 5.7                                  | 5.93                                    | 104.9                                 | 108.1                                 | 622  | 5.22            |
| Floor, Wall or Pipeless Furnace .....                 | 5.1                            | .31                                 | .32                                     | 1.6                                  | 5.28                                    | 60.7                                  | 62.5                                  | 320  | 6.50            |
| Room Heater .....                                     | 3.9                            | .26                                 | .27                                     | 1.5                                  | 5.76                                    | 66.6                                  | 68.6                                  | 383  | 6.51            |
| None/Other .....                                      | 7.4                            | .18                                 | .19                                     | 1.3                                  | 7.36                                    | 24.7                                  | 25.5                                  | 182  | 7.17            |

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

• Because of rounding, data may not sum to totals. • See "Glossary" for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Forms EIA-457 A, B, C, F of the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).

## NATURAL GAS HEATED

**Table 15. Natural Gas Consumption and Expenditures for Households  
Using Natural Gas as Main Heating Fuel, 1987**

|  |                    | Natural Gas Used:              |                                       |                                       |                                |                                       |                                       |  |                 |  |
|--|--------------------|--------------------------------|---------------------------------------|---------------------------------------|--------------------------------|---------------------------------------|---------------------------------------|--|-----------------|--|
|  |                    | As Main Heating Fuel           |                                       |                                       | Not as Main Heating Fuel       |                                       |                                       |  |                 |  |
| Household Characteristics                  | RSE Column Factors | Number of Households (million) | Average Amount Consumed (thousand cf) | Average Amount Consumed (million Btu) | Number of Households (million) | Average Amount Consumed (thousand cf) | Average Amount Consumed (million Btu) | Average Expenditures per Household (dollars) | RSE Row Factors |  |
|  |                    | 50.0                           | 90.2                                  | 93.0                                  | 497                            | 7.3                                   | 24.4                                  | 25.2   | 179             |  |
| <b>Total U.S. Households</b>               |                    | 50.0                           | 90.2                                  | 93.0                                  | 497                            | 7.3                                   | 24.4                                  | 25.2   | 179             |  |
| <b>Census Region and Division</b>          |                    |                                |                                       |                                       |                                |                                       |                                       |  | 4.21            |  |
| Northeast .....                            |                    | 8.1                            | 115.4                                 | 119.0                                 | 742                            | 3.6                                   | 18.9                                  | 19.5   | 183             |  |
| New England .....                          |                    | 1.2                            | 108.5                                 | 111.9                                 | 738                            | .5                                    | 27.6                                  | 28.5   | 234             |  |
| Middle Atlantic .....                      |                    | 6.9                            | 116.6                                 | 120.2                                 | 743                            | 3.1                                   | 17.5                                  | 18.0   | 174             |  |
| Midwest .....                              |                    | 16.5                           | 105.5                                 | 108.8                                 | 534                            | .6                                    | 46.5                                  | 47.9   | 286             |  |
| East North Central .....                   |                    | 11.8                           | 109.2                                 | 112.6                                 | 562                            | .4                                    | 50.3                                  | 51.8   | 307             |  |
| West North Central .....                   |                    | 4.8                            | 96.4                                  | 99.4                                  | 464                            | .1                                    | 35.4                                  | 36.5   | 227             |  |
| South .....                                |                    | 13.5                           | 75.4                                  | 77.8                                  | 429                            | 1.6                                   | 25.0                                  | 25.8   | 151             |  |
| South Atlantic .....                       |                    | 5.3                            | 80.0                                  | 82.5                                  | 533                            | .6                                    | 26.4                                  | 27.2   | 207             |  |
| East South Central .....                   |                    | 2.4                            | 75.8                                  | 78.2                                  | 384                            | .9                                    | Q                                     | Q  | 21.59           |  |
| West South Central .....                   |                    | 5.9                            | 71.2                                  | 73.4                                  | 354                            | 1.6                                   | 28.2                                  | 29.1   | Q               |  |
| West .....                                 |                    | 11.8                           | 68.3                                  | 70.4                                  | 354                            | 2.2                                   | 29.1                                  | 30.2   | 12.10           |  |
| Mountain .....                             |                    | 3.3                            | 90.7                                  | 93.5                                  | 424                            | 2                                     | 38.0                                  | 39.2   | 162             |  |
| Pacific .....                              |                    | 8.5                            | 59.7                                  | 61.5                                  | 327                            | 1.4                                   | 26.7                                  | 27.5   | 6.06            |  |
| Total U.S. Households .....                |                    | 50.0                           | 90.2                                  | 93.0                                  | 497                            | 7.3                                   | 24.4                                  | 25.2   | 179             |  |
| <b>Metropolitan Status</b>                 |                    |                                |                                       |                                       |                                |                                       |                                       |  |                 |  |
| Metropolitan .....                         |                    | 41.9                           | 90.6                                  | 93.4                                  | 504                            | 6.9                                   | 23.0                                  | 23.8   | 173             |  |
| Central City .....                         |                    | 19.5                           | 90.9                                  | 93.7                                  | 504                            | 3.8                                   | 20.8                                  | 21.5   | 165             |  |
| Outside Central City .....                 |                    | 22.3                           | 90.4                                  | 93.2                                  | 504                            | 3.1                                   | 25.8                                  | 26.6   | 182             |  |
| Nonmetropolitan .....                      |                    | 8.1                            | 87.9                                  | 90.7                                  | 460                            | .5                                    | 44.7                                  | 46.1   | 279             |  |
| <b>Climate Zone</b>                        |                    |                                |                                       |                                       |                                |                                       |                                       |  |                 |  |
| Under 2,000 CDD and--                      |                    |                                |                                       |                                       |                                |                                       |                                       |  |                 |  |
| Over 7,000 HDD .....                       |                    | 3.9                            | 101.2                                 | 104.3                                 | 622                            | .3                                    | 34.9                                  | 36.0   | 214             |  |
| 5,500 to 7,000 HDD .....                   |                    | 17.7                           | 111.6                                 | 115.1                                 | 578                            | 1.3                                   | 34.4                                  | 35.4   | 245             |  |
| 4,000 to 5,499 HDD .....                   |                    | 10.2                           | 98.4                                  | 101.4                                 | 598                            | 2.9                                   | 18.3                                  | 18.5   | 176             |  |
| Under 4,000 HDD .....                      |                    | 10.6                           | 62.8                                  | 64.7                                  | 364                            | 1.6                                   | 26.5                                  | 27.3   | 153             |  |
| 2,000 CDD or More and --                   |                    |                                |                                       |                                       |                                |                                       |                                       |  | 8.03            |  |
| Under 4,000 HDD .....                      |                    | 7.6                            | 61.5                                  | 63.4                                  | 342                            | 1.2                                   | 22.9                                  | 23.6   | 142             |  |
| <b>All Gas Paid by Household</b>           |                    |                                |                                       |                                       |                                |                                       |                                       |  | 14.89           |  |
| Yes .....                                  |                    | 40.0                           | 94.4                                  | 97.3                                  | 518                            | 4.2                                   | 30.4                                  | 31.3   | 225             |  |
| Budget Plan .....                          |                    | 7.6                            | 116.1                                 | 119.7                                 | 652                            | NC                                    | NC                                    | NC   | 7.08            |  |
| No Budget Plan .....                       |                    | 32.4                           | 89.3                                  | 92.1                                  | 486                            | 4.2                                   | 30.4                                  | 31.3   | 225             |  |
| No .....                                   |                    | 10.0                           | 73.1                                  | 75.3                                  | 413                            | 3.1                                   | 16.2                                  | 16.7   | 117             |  |
| <b>Housing Structure by Status of Unit</b> |                    |                                |                                       |                                       |                                |                                       |                                       |  |                 |  |
| Single-Family Detached .....               |                    | 31.2                           | 99.5                                  | 102.6                                 | 541                            | 2.4                                   | 39.7                                  | 41.0   | 258             |  |
| Owned .....                                |                    | 26.7                           | 100.7                                 | 103.8                                 | 548                            | 2.1                                   | 40.4                                  | 41.6   | 263             |  |
| Rented .....                               |                    | 4.5                            | 92.6                                  | 95.5                                  | 499                            | .3                                    | 34.2                                  | 35.2   | 218             |  |
| Single-Family Attached .....               |                    | 3.1                            | 87.7                                  | 90.4                                  | 529                            | .4                                    | 24.0                                  | 24.8   | 238             |  |
| Owned .....                                |                    | 2.3                            | 93.8                                  | 96.7                                  | 575                            | .3                                    | 23.9                                  | 24.6   | 237             |  |
| Rented .....                               |                    | .8                             | 71.2                                  | 73.4                                  | 401                            | Q                                     | Q                                     | Q  | 38.58           |  |
| Building of 2 to 4 Units .....             |                    | 6.7                            | 83.8                                  | 86.4                                  | 474                            | 1.3                                   | 24.8                                  | 25.6   | 218             |  |
| Owned .....                                |                    | 1.2                            | 108.7                                 | 112.0                                 | 624                            | .4                                    | 24.2                                  | 24.9   | 195             |  |
| Rented .....                               |                    | 5.4                            | 78.0                                  | 80.5                                  | 439                            | .9                                    | 25.2                                  | 26.0   | 229             |  |
| Building of 5 or More Units .....          |                    | 7.3                            | 61.8                                  | 63.7                                  | 344                            | 3.1                                   | 12.5                                  | 12.9   | 95              |  |
| Owned .....                                |                    | .3                             | 75.9                                  | 78.3                                  | 409                            | Q                                     | 14.3                                  | 14.7   | 109             |  |
| Rented .....                               |                    | 7.0                            | 61.1                                  | 63.0                                  | 341                            | 2.8                                   | 12.4                                  | 12.7   | 94              |  |
| Mobile Home .....                          |                    | 1.7                            | 70.2                                  | 72.4                                  | 375                            | Q                                     | Q                                     | Q  | 14.88           |  |

See footnotes at end of table.

**Table 15. Natural Gas Consumption and Expenditures for Households Using Natural Gas as Main Heating Fuel, 1987 (Continued)**

| Household Characteristics                              | Natural Gas Used:              |                                       |                                       |  |                                |                                       |                                       |  | RSE Row Factors |  |
|--|--------------------------------|---------------------------------------|---------------------------------------|--|--------------------------------|---------------------------------------|---------------------------------------|--|-----------------|--|
|  | As Main Heating Fuel           |                                       |                                       |  | Not as Main Heating Fuel       |                                       |                                       |  |                 |  |
|  | Number of Households (million) | Average Amount Consumed (thousand cf) | Average Amount Consumed (million Btu) | Average Expenditures per Household (dollars) | Number of Households (million) | Average Amount Consumed (thousand cf) | Average Amount Consumed (million Btu) | Average Expenditures per Household (dollars) |                 |  |
| RSE Column Factors:                                    | 0.897                          | 0.433                                 | 0.433                                 | 0.464  | 2.254                          | 1.879                                 | 1.879                                 | 1.611  |                 |  |
| <b>Number of Rooms</b>                                 |                                |                                       |                                       |  |                                |                                       |                                       |  |                 |  |
| 1 .....  | 0.4                            | 52.3                                  | 53.9                                  | 309  | Q                              | Q                                     | Q                                     | Q  | 39.11           |  |
| 2 .....  | 1.1                            | 48.5                                  | 50.0                                  | 253  | 0.5                            | 18.1                                  | 18.7                                  | 91   | 14.79           |  |
| 3 .....  | 4.4                            | 59.4                                  | 61.3                                  | 328  | 1.7                            | 11.4                                  | 11.8                                  | 93   | 10.45           |  |
| 4 .....  | 9.1                            | 71.5                                  | 73.7                                  | 396  | 1.4                            | 17.4                                  | 17.9                                  | 145  | 6.39            |  |
| 5 .....  | 11.9                           | 83.5                                  | 86.0                                  | 456  | 1.3                            | 30.8                                  | 31.8                                  | 233  | 4.66            |  |
| 6 .....  | 10.5                           | 97.6                                  | 100.7                                 | 535  | 1.1                            | 32.3                                  | 33.3                                  | 237  | 6.15            |  |
| 7 .....  | 6.6                            | 108.4                                 | 111.7                                 | 607  | .6                             | 36.3                                  | 37.4                                  | 244  | 6.92            |  |
| 8 or More .....  | 6.0                            | 131.2                                 | 135.3                                 | 723  | .5                             | 46.3                                  | 47.8                                  | 327  | 7.89            |  |
| <b>Number of Rooms That Can Be Air Conditioned</b>     |                                |                                       |                                       |  |                                |                                       |                                       |  |                 |  |
| All .....  | 22.0                           | 85.2                                  | 87.8                                  | 465  | 2.9                            | 23.3                                  | 24.0                                  | 151  | 6.69            |  |
| Some .....   | 10.1                           | 97.9                                  | 100.9                                 | 555  | 1.6                            | 26.6                                  | 27.5                                  | 228  | 8.72            |  |
| None .....   | 17.9                           | 92.0                                  | 94.8                                  | 503  | 2.8                            | 24.2                                  | 25.0                                  | 180  | 4.40            |  |
| <b>Measured Heated Area of Residence (square feet)</b> |                                |                                       |                                       |  |                                |                                       |                                       |  |                 |  |
| Fewer than 600 .....                                   | 3.7                            | 59.6                                  | 61.4                                  | 331  | 1.6                            | 19.4                                  | 20.0                                  | 139  | 9.19            |  |
| 600 to 999 .....                                       | 13.1                           | 71.5                                  | 73.7                                  | 393  | 2.3                            | 16.6                                  | 17.2                                  | 131  | 6.65            |  |
| 1,000 to 1,599 .....                                   | 13.4                           | 81.4                                  | 84.0                                  | 448  | 1.5                            | 29.3                                  | 30.2                                  | 204  | 5.75            |  |
| 1,600 to 1,999 .....                                   | 6.6                            | 99.4                                  | 102.5                                 | 555  | .6                             | 26.3                                  | 27.1                                  | 205  | 6.37            |  |
| 2,000 to 2,399 .....                                   | 5.4                            | 108.7                                 | 112.1                                 | 602  | .5                             | 40.2                                  | 41.4                                  | 281  | 8.27            |  |
| 2,400 to 2,999 .....                                   | 4.9                            | 124.2                                 | 128.0                                 | 684  | .4                             | 33.5                                  | 34.5                                  | 238  | 8.57            |  |
| 3,000 or More .....                                    | 2.9                            | 140.8                                 | 145.2                                 | 756  | .4                             | 38.3                                  | 39.5                                  | 296  | 8.26            |  |
| <b>Year of Construction</b>                            |                                |                                       |                                       |  |                                |                                       |                                       |  |                 |  |
| 1939 or Before .....                                   | 12.9                           | 108.7                                 | 112.1                                 | 604  | 2.8                            | 28.4                                  | 29.2                                  | 237  | 6.29            |  |
| 1940 to 1949 .....                                     | 5.2                            | 87.1                                  | 89.8                                  | 496  | .8                             | 17.7                                  | 18.3                                  | 144  | 8.00            |  |
| 1950 to 1959 .....                                     | 8.4                            | 88.6                                  | 91.3                                  | 484  | .8                             | 27.9                                  | 28.8                                  | 184  | 7.07            |  |
| 1960 to 1969 .....                                     | 10.8                           | 80.6                                  | 83.1                                  | 454  | 1.0                            | 20.2                                  | 20.9                                  | 143  | 7.48            |  |
| 1970 to 1974 .....                                     | 5.2                            | 87.4                                  | 90.2                                  | 466  | .6                             | 27.2                                  | 28.0                                  | 151  | 9.77            |  |
| 1975 to 1979 .....                                     | 3.7                            | 82.3                                  | 84.8                                  | 422  | .9                             | 20.0                                  | 20.6                                  | 113  | 15.10           |  |
| 1980 to 1984 .....                                     | 2.6                            | 69.5                                  | 71.7                                  | 379  | .4                             | 21.1                                  | 21.7                                  | 137  | 19.13           |  |
| 1985 or After .....                                    | 1.1                            | 83.3                                  | 85.8                                  | 448  | Q                              | Q                                     | Q                                     | Q  | 20.31           |  |
| <b>Status of Unit</b>                                  |                                |                                       |                                       |  |                                |                                       |                                       |  |                 |  |
| Owned .....  | 32.0                           | 99.0                                  | 102.0                                 | 544  | 3.3                            | 33.9                                  | 35.0                                  | 236  | 4.25            |  |
| Condominium .....                                      | .8                             | 70.8                                  | 73.0                                  | 356  | Q                              | Q                                     | Q                                     | Q  | 35.84           |  |
| Not a Condominium .....                                | 31.2                           | 99.7                                  | 102.7                                 | 549  | 3.1                            | 35.1                                  | 36.2                                  | 243  | 4.01            |  |
| Rented .....   | 18.0                           | 74.5                                  | 76.8                                  | 413  | 4.1                            | 16.7                                  | 17.2                                  | 134  | 6.26            |  |
| Public Housing .....                                   | 1.5                            | 61.1                                  | 63.0                                  | 355  | .3                             | Q                                     | Q                                     | Q  | 17.91           |  |
| Not Public Housing .....                               | 16.4                           | 75.8                                  | 78.1                                  | 418  | 3.8                            | 16.8                                  | 17.3                                  | 136  | 6.94            |  |
| Rent Subsidy .....                                     | .8                             | 77.0                                  | 79.4                                  | 484  | .2                             | 16.7                                  | 17.2                                  | 146  | 26.15           |  |
| No Rent Subsidy .....                                  | 15.7                           | 75.7                                  | 78.1                                  | 415  | 3.6                            | 16.8                                  | 17.3                                  | 135  | 7.04            |  |
| <b>1987 Family Income</b>                              |                                |                                       |                                       |  |                                |                                       |                                       |  |                 |  |
| Less than \$5,000 .....                                | 3.2                            | 86.2                                  | 88.9                                  | 477  | .6                             | 14.8                                  | 15.3                                  | 97   | 9.49            |  |
| \$5,000 to \$9,999 .....                               | 6.6                            | 81.8                                  | 84.3                                  | 444  | .8                             | 22.4                                  | 23.1                                  | 170  | 7.89            |  |
| \$10,000 to \$14,999 .....                             | 7.0                            | 83.3                                  | 85.9                                  | 455  | 1.1                            | 21.4                                  | 22.1                                  | 165  | 7.00            |  |
| \$15,000 to \$19,999 .....                             | 5.0                            | 82.9                                  | 85.5                                  | 454  | .6                             | 24.9                                  | 25.7                                  | 197  | 8.01            |  |
| \$20,000 to \$24,999 .....                             | 4.4                            | 85.3                                  | 88.0                                  | 454  | .8                             | 31.7                                  | 32.7                                  | 214  | 7.52            |  |
| \$25,000 to \$34,999 .....                             | 8.6                            | 88.0                                  | 90.7                                  | 487  | 1.3                            | 21.6                                  | 22.3                                  | 171  | 7.29            |  |
| \$35,000 to \$49,999 .....                             | 7.4                            | 98.2                                  | 101.3                                 | 546  | .8                             | 26.2                                  | 27.0                                  | 186  | 7.64            |  |
| \$50,000 or More .....                                 | 7.8                            | 107.2                                 | 110.6                                 | 603  | 1.3                            | 29.2                                  | 30.1                                  | 207  | 7.60            |  |

See footnotes at end of table.

**Table 15. Natural Gas Consumption and Expenditures for Households Using Natural Gas as Main Heating Fuel, 1987 (Continued)**

| Household Characteristics                             | Natural Gas Used:              |                                       |                                       |  |                                |                                       |                                       |  | RSE Row Factors |  |
|---|--------------------------------|---------------------------------------|---------------------------------------|--|--------------------------------|---------------------------------------|---------------------------------------|--|-----------------|--|
|   | As Main Heating Fuel           |                                       |                                       |  | Not as Main Heating Fuel       |                                       |                                       |  |                 |  |
|   | Number of Households (million) | Average Amount Consumed (thousand cf) | Average Amount Consumed (million Btu) | Average Expenditures per Household (dollars) | Number of Households (million) | Average Amount Consumed (thousand cf) | Average Amount Consumed (million Btu) | Average Expenditures per Household (dollars) |                 |  |
|   | RSE Column Factors:            | 0.897                                 | 0.433                                 | 0.433  | 0.464                          | 2.254                                 | 1.879                                 | 1.879  | 1.611           |  |
| <b>Below 100 Percent of Poverty Line</b>              | 6.4                            | 86.9                                  | 89.6                                  | 481  | 1.0                            | 23.4                                  | 24.1                                  | 163  | 8.05            |  |
| <b>Below 125 Percent of Poverty Line</b>              | 10.1                           | 86.0                                  | 88.6                                  | 473  | 1.4                            | 24.2                                  | 25.0                                  | 171  | 6.82            |  |
| <b>Assistance for Heating in Winter</b>               |                                |                                       |                                       |  |                                |                                       |                                       |  |                 |  |
| Yes   | 2.7                            | 98.4                                  | 101.5                                 | 545  | .4                             | 29.7                                  | 30.6                                  | 208  | 11.08           |  |
| No  | 47.3                           | 89.7                                  | 92.5                                  | 494  | 7.0                            | 24.1                                  | 24.9                                  | 178  | 4.29            |  |
| <b>Assistance for Weatherization of Residence</b>     |                                |                                       |                                       |  |                                |                                       |                                       |  |                 |  |
| Yes   | .6                             | 94.3                                  | 97.2                                  | 519  | Q                              | Q                                     | Q                                     | Q  | 24.20           |  |
| No  | 49.4                           | 90.1                                  | 92.9                                  | 497  | 7.3                            | 24.4                                  | 25.2                                  | 180  | 4.21            |  |
| <b>Household Owns or Has Regular Use of a Vehicle</b> |                                |                                       |                                       |  |                                |                                       |                                       |  |                 |  |
| Yes   | 43.7                           | 90.4                                  | 93.2                                  | 495  | 5.2                            | 27.8                                  | 28.6                                  | 191  | 4.15            |  |
| No  | 6.3                            | 88.6                                  | 91.3                                  | 512  | 2.1                            | 16.1                                  | 16.6                                  | 152  | 8.85            |  |
| <b>Race of Householder</b>                            |                                |                                       |                                       |  |                                |                                       |                                       |  |                 |  |
| White   | 40.9                           | 90.3                                  | 93.1                                  | 491  | 5.7                            | 23.9                                  | 24.7                                  | 170  | 4.45            |  |
| Black   | 7.4                            | 93.8                                  | 96.7                                  | 558  | 1.2                            | 29.0                                  | 29.9                                  | 236  | 7.21            |  |
| Other   | 1.8                            | 71.4                                  | 73.6                                  | 375  | .4                             | 17.9                                  | 18.4                                  | 155  | 11.42           |  |
| <b>Householder of Hispanic Descent</b>                |                                |                                       |                                       |  |                                |                                       |                                       |  |                 |  |
| Yes   | 2.9                            | 72.4                                  | 74.7                                  | 393  | .8                             | 20.3                                  | 20.9                                  | 162  | 9.39            |  |
| No  | 47.1                           | 91.2                                  | 94.1                                  | 503  | 6.5                            | 24.9                                  | 25.7                                  | 182  | 4.35            |  |
| <b>Age of Householder</b>                             |                                |                                       |                                       |  |                                |                                       |                                       |  |                 |  |
| Under 25 Years  | 3.5                            | 73.1                                  | 75.4                                  | 400  | .6                             | 19.8                                  | 20.4                                  | 123  | 12.40           |  |
| 25 to 34 Years  | 12.1                           | 85.3                                  | 88.0                                  | 468  | 1.9                            | 24.5                                  | 25.3                                  | 175  | 6.73            |  |
| 35 to 44 Years  | 9.5                            | 94.0                                  | 96.9                                  | 510  | 1.3                            | 33.5                                  | 34.6                                  | 230  | 5.46            |  |
| 45 to 59 Years  | 10.4                           | 100.0                                 | 103.1                                 | 552  | 1.3                            | 26.5                                  | 27.3                                  | 199  | 5.75            |  |
| 60 Years and Over                                     | 14.6                           | 88.8                                  | 91.5                                  | 497  | 2.2                            | 19.0                                  | 19.6                                  | 157  | 6.17            |  |
| <b>Household Size</b>                                 |                                |                                       |                                       |  |                                |                                       |                                       |  |                 |  |
| 1 Person  | 12.0                           | 77.2                                  | 79.6                                  | 419  | 2.3                            | 13.2                                  | 13.6                                  | 100  | 7.18            |  |
| 2 Persons   | 16.5                           | 85.9                                  | 88.5                                  | 472  | 2.3                            | 21.6                                  | 22.2                                  | 162  | 5.08            |  |
| 3 Persons   | 8.6                            | 92.3                                  | 95.1                                  | 512  | 1.1                            | 28.0                                  | 28.8                                  | 208  | 5.53            |  |
| 4 Persons   | 7.5                            | 105.5                                 | 108.8                                 | 579  | 1.0                            | 37.0                                  | 38.2                                  | 269  | 6.39            |  |
| 5 Persons   | 3.6                            | 105.2                                 | 108.5                                 | 595  | .5                             | 43.4                                  | 44.7                                  | 298  | 8.20            |  |
| 6 or More Persons                                     | 1.7                            | 112.6                                 | 116.1                                 | 634  | .3                             | 49.3                                  | 50.8                                  | 347  | 9.42            |  |
| <b>Secondary Heating</b>                              |                                |                                       |                                       |  |                                |                                       |                                       |  |                 |  |
| Yes   | 18.3                           | 95.2                                  | 98.1                                  | 517  | 2.6                            | 35.8                                  | 36.9                                  | 235  | 5.46            |  |
| Over 33 Percent of Home's Total Heat                  | 1.0                            | 72.1                                  | 74.3                                  | 380  | .2                             | 61.5                                  | 63.4                                  | 383  | 14.83           |  |
| No  | 31.7                           | 87.3                                  | 90.0                                  | 485  | 4.7                            | 17.9                                  | 18.5                                  | 148  | 5.24            |  |

NC No cases in sample.

Q Data withheld either because the RSE was greater than 50 percent or fewer than 10 households were sampled.

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

• Because of rounding, data may not sum to totals. • See "Glossary" for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Forms EIA-457 A, B, C, F of the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).

ELECTRICITY

**Table 16. Household Electricity Consumption and Expenditures, 1987**

| Household Characteristics                  | Electricity                    |   |                                      |                               |                                     |  |                                       |  | RSE Row Factors |
|--|--------------------------------|---|--------------------------------------|-------------------------------|-------------------------------------|--|---------------------------------------|--|-----------------|
|  | Number of Households (million) | Total Amount Consumed (quad-trillion Btu) | Total Expenditures (billion dollars) | Average Price (cents per kWh) | Total Amount Consumed (billion kWh) | Average Amount Consumed (thousand kWh) | Average Amount Consumed (million Btu) | Average Expenditures per Household (dollars) |                 |
| RSE Column Factors:                        | 1.250                          | 1.486                                     | 1.434                                | 0.416                         | 1.486                               | 0.869                                  | 0.869                                 | 0.805  |                 |
| <b>Total U.S. Households</b>               | 90.5                           | 2.76                                      | 61.6                                 | 7.6                           | 808                                 | 8.93                                   | 30.5                                  | 680  | 1.34            |
| <b>Census Region and Division</b>          |                                |   |                                      |                               |                                     |  |                                       |  |                 |
| Northeast                                  | 19.0                           | .44                                       | 12.3                                 | 9.5                           | 130                                 | 6.83                                   | 23.3                                  | 648  | 2.50            |
| New England                                | 4.3                            | .10                                       | 2.6                                  | 8.9                           | 29                                  | 6.73                                   | 22.9                                  | 600  | 4.49            |
| Middle Atlantic                            | 14.8                           | .35                                       | 9.8                                  | 9.6                           | 101                                 | 6.87                                   | 23.4                                  | 661  | 2.60            |
| Midwest                                    | 22.3                           | .61                                       | 14.1                                 | 7.9                           | 179                                 | 8.03                                   | 27.4                                  | 633  | 3.75            |
| East North Central                         | 15.9                           | .42                                       | 10.0                                 | 8.1                           | 123                                 | 7.74                                   | 26.4                                  | 628  | 4.33            |
| West North Central                         | 6.4                            | .19                                       | 4.1                                  | 7.4                           | 56                                  | 8.73                                   | 29.8                                  | 644  | 3.69            |
| South                                      | 30.9                           | 1.22                                      | 25.1                                 | 7.0                           | 357                                 | 11.56                                  | 39.5                                  | 813  | 2.48            |
| South Atlantic                             | 15.6                           | .61                                       | 13.1                                 | 7.4                           | 178                                 | 11.42                                  | 38.9                                  | 840  | 3.80            |
| East South Central                         | 6.1                            | .27                                       | 4.7                                  | 6.0                           | 78                                  | 12.81                                  | 43.7                                  | 765  | 4.32            |
| West South Central                         | 9.2                            | .35                                       | 7.4                                  | 7.3                           | 102                                 | 11.00                                  | 37.5                                  | 800  | 5.18            |
| West                                       | 18.3                           | .48                                       | 10.0                                 | 7.1                           | 142                                 | 7.74                                   | 26.4                                  | 548  | 2.99            |
| Mountain                                   | 4.4                            | .12                                       | 2.6                                  | 7.3                           | 36                                  | 8.15                                   | 27.8                                  | 591  | 6.17            |
| Pacific                                    | 13.9                           | .36                                       | 7.4                                  | 7.0                           | 105                                 | 7.61                                   | 26.0                                  | 534  | 3.19            |
| <b>Metropolitan Status</b>                 |                                |   |                                      |                               |                                     |  |                                       |  |                 |
| Metropolitan                               | 70.2                           | 2.07                                      | 47.6                                 | 7.9                           | 606                                 | 8.62                                   | 29.4                                  | 678  | 1.52            |
| Central City                               | 29.6                           | .74                                       | 17.1                                 | 7.9                           | 216                                 | 7.29                                   | 24.9                                  | 578  | 2.45            |
| Outside Central City                       | 40.6                           | 1.33                                      | 30.5                                 | 7.8                           | 390                                 | 9.59                                   | 32.7                                  | 750  | 1.83            |
| Nonmetropolitan                            | 20.3                           | .69                                       | 14.0                                 | 6.9                           | 202                                 | 9.98                                   | 34.0                                  | 690  | 3.49            |
| <b>Climate Zone</b>                        |                                |   |                                      |                               |                                     |  |                                       |  |                 |
| Under 2,000 CDD and--                      |                                |   |                                      |                               |                                     |  |                                       |  |                 |
| Over 7,000 HDD                             | 8.5                            | .23                                       | 4.8                                  | 7.1                           | 68                                  | 7.98                                   | 27.2                                  | 564  | 5.99            |
| 5,500 to 7,000 HDD                         | 25.9                           | .69                                       | 16.3                                 | 8.1                           | 201                                 | 7.75                                   | 26.5                                  | 629  | 5.62            |
| 4,000 to 5,499 HDD                         | 21.9                           | .67                                       | 14.9                                 | 7.6                           | 196                                 | 8.96                                   | 30.6                                  | 678  | 4.74            |
| Under 4,000 HDD                            | 17.8                           | .53                                       | 11.5                                 | 7.4                           | 154                                 | 8.63                                   | 29.4                                  | 642  | 5.34            |
| 2,000 CDD or More and --                   |                                |   |                                      |                               |                                     |  |                                       |  |                 |
| Under 4,000 HDD                            | 16.3                           | .64                                       | 14.2                                 | 7.5                           | 189                                 | 11.56                                  | 39.5                                  | 868  | 4.79            |
| <b>All Electricity Paid by Household</b>   |                                |   |                                      |                               |                                     |  |                                       |  |                 |
| Yes  | 83.2                           | 2.62                                      | 58.5                                 | 7.6                           | 768                                 | 9.22                                   | 31.5                                  | 703  | 1.45            |
| Budget Plan                                | 1.3                            | .09                                       | 1.7                                  | 6.6                           | 25                                  | 18.85                                  | 64.3                                  | 1,246  | 7.75            |
| No Budget Plan                             | 81.9                           | 2.53                                      | 56.8                                 | 7.7                           | 742                                 | 9.06                                   | 30.9                                  | 694  | 1.42            |
| No   | 7.3                            | .14                                       | 3.1                                  | 7.6                           | 40                                  | 5.55                                   | 18.9                                  | 423  | 7.12            |
| <b>Housing Structure by Status of Unit</b> |                                |   |                                      |                               |                                     |  |                                       |  |                 |
| Single-Family Detached                     | 55.1                           | 1.97                                      | 43.1                                 | 7.5                           | 577                                 | 10.46                                  | 35.7                                  | 782  | 1.86            |
| Owned                                      | 47.7                           | 1.76                                      | 38.5                                 | 7.5                           | 515                                 | 10.79                                  | 36.8                                  | 808  | 2.05            |
| Rented                                     | 7.4                            | .21                                       | 4.6                                  | 7.4                           | 62                                  | 8.34                                   | 28.5                                  | 619  | 4.11            |
| Single-Family Attached                     | 5.3                            | .16                                       | 3.8                                  | 8.1                           | 47                                  | 8.84                                   | 30.2                                  | 718  | 10.71           |
| Owned                                      | 3.9                            | .11                                       | 2.8                                  | 8.4                           | 33                                  | 8.46                                   | 28.9                                  | 714  | 11.68           |
| Rented                                     | 1.5                            | .05                                       | 1.1                                  | 7.4                           | 14                                  | 9.86                                   | 33.6                                  | 731  | 15.19           |
| Building of 2 to 4 Units                   | 10.1                           | .20                                       | 4.9                                  | 8.4                           | 58                                  | 5.73                                   | 19.6                                  | 483  | 5.93            |
| Owned                                      | 2.0                            | .04                                       | 1.1                                  | 9.4                           | 12                                  | 6.16                                   | 21.0                                  | 577  | 8.92            |
| Rented                                     | 8.1                            | .15                                       | 3.7                                  | 8.2                           | 45                                  | 5.63                                   | 19.2                                  | 459  | 6.88            |
| Building of 5 or More Units                | 14.9                           | .28                                       | 6.5                                  | 8.0                           | 81                                  | 5.42                                   | 18.5                                  | 436  | 5.85            |
| Owned                                      | 1.0                            | .02                                       | .6                                   | 8.9                           | 7                                   | 6.90                                   | 23.6                                  | 616  | 18.06           |
| Rented                                     | 13.9                           | .25                                       | 5.9                                  | 8.0                           | 74                                  | 5.32                                   | 18.1                                  | 424  | 6.11            |
| Mobile Home                                | 5.1                            | .16                                       | 3.3                                  | 7.1                           | 46                                  | 8.98                                   | 30.6                                  | 641  | 6.99            |
| Owned                                      | 4.3                            | .14                                       | 2.8                                  | 7.1                           | 40                                  | 9.34                                   | 31.9                                  | 661  | 7.73            |
| Rented                                     | .9                             | .02                                       | .5                                   | 7.6                           | 6                                   | 7.19                                   | 24.5                                  | 544  | 10.41           |

See footnotes at end of table.

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Energy Information Administration/Household Energy Consumption and Expenditures 1987, National

## ELECTRICITY

**Table 16. Household Electricity Consumption and Expenditures, 1987  
(Continued)**

| Household Characteristics                              | RSE Column Factors | Electricity                             |                                      |                                     |  |                                       |  |       | RSE Row Factors |
|--|--------------------|---|--------------------------------------|-------------------------------------|--|---------------------------------------|--|-------|-----------------|
|  |                    | Total Amount Consumed (quadrillion Btu) | Average Price (cents per kWh)        | Total Amount Consumed (billion kWh) | Average Amount Consumed (thousand kWh) | Average Amount Consumed (million Btu) | Average Expenditures per Household (dollars) |       |                 |
|  |                    | Number of Households (million)          | Total Expenditures (billion dollars) | 0.416                               | 1.486                                  | 0.869                                 | 0.805  |       |                 |
| <b>Number of Rooms</b>                                 |                    |   |                                      |                                     |  |                                       |  |       |                 |
| 1  | 0.7                | 0.01                                    | 0.2                                  | 8.8                                 | 2                                      | 3.59                                  | 12.2   | 314   | 20.59           |
| 2  | 2.4                | .03                                     | .7                                   | 8.0                                 | 9                                      | 3.54                                  | 12.1   | 284   | 9.56            |
| 3  | 9.8                | .18                                     | 4.2                                  | 7.8                                 | 54                                     | 5.45                                  | 18.6   | 427   | 5.84            |
| 4  | 17.7               | .42                                     | 9.3                                  | 7.5                                 | 123                                    | 6.97                                  | 23.8   | 526   | 3.33            |
| 5  | 20.9               | .61                                     | 13.5                                 | 7.7                                 | 180                                    | 8.62                                  | 29.4   | 648   | 2.63            |
| 6  | 17.4               | .59                                     | 13.5                                 | 7.7                                 | 174                                    | 10.01                                 | 34.1   | 773   | 3.15            |
| 7  | 11.2               | .44                                     | 9.8                                  | 7.6                                 | 128                                    | 11.40                                 | 38.9   | 871   | 3.80            |
| 8 or More  | 10.4               | .47                                     | 10.4                                 | 7.6                                 | 138                                    | 13.29                                 | 45.3   | 1,003 | 3.70            |
| <b>Number of Rooms That Can Be Air Conditioned</b>     |                    |   |                                      |                                     |  |                                       |  |       |                 |
| All  | 40.8               | 1.58                                    | 34.3                                 | 7.4                                 | 462                                    | 11.31                                 | 38.6   | 840   | 2.23            |
| Some   | 16.8               | .44                                     | 10.6                                 | 8.3                                 | 129                                    | 7.85                                  | 26.1   | 632   | 2.94            |
| None   | 32.9               | .74                                     | 16.7                                 | 7.7                                 | 218                                    | 6.62                                  | 22.6   | 507   | 2.70            |
| <b>Measured Heated Area of Residence (square feet)</b> |                    |   |                                      |                                     |  |                                       |  |       |                 |
| 8.4  | .14                | 3.4                                     | 8.3                                  | 41                                  | 4.83                                   | 16.5                                  | 403  | 5.41  |                 |
| 23.9   | .55                | 12.3                                    | 7.7                                  | 160                                 | 6.70                                   | 22.9                                  | 515  | 2.93  |                 |
| 25.6   | .83                | 17.9                                    | 7.4                                  | 242                                 | 9.48                                   | 32.3                                  | 701  | 2.77  |                 |
| 11.2   | .40                | 8.9                                     | 7.6                                  | 117                                 | 10.38                                  | 35.5                                  | 791  | 3.29  |                 |
| 8.4  | .31                | 7.0                                     | 7.7                                  | 91                                  | 10.77                                  | 36.7                                  | 831  | 4.19  |                 |
| 7.7  | .29                | 6.6                                     | 7.7                                  | 85                                  | 11.03                                  | 37.6                                  | 851  | 4.26  |                 |
| 5.3  | .25                | 5.5                                     | 7.6                                  | 72                                  | 13.73                                  | 46.8                                  | 1,049  | 4.57  |                 |
| <b>Year of Construction</b>                            |                    |   |                                      |                                     |  |                                       |  |       |                 |
| 1939 or Before   | 21.5               | .48                                     | 11.7                                 | 8.3                                 | 141                                    | 6.58                                  | 22.5   | 545   | 3.21            |
| 1940 to 1949   | 8.2                | .22                                     | 4.9                                  | 7.7                                 | 63                                     | 7.67                                  | 26.2   | 592   | 4.39            |
| 1950 to 1959   | 13.1               | .38                                     | 8.7                                  | 7.8                                 | 111                                    | 8.51                                  | 29.0   | 666   | 3.31            |
| 1960 to 1969   | 16.4               | .50                                     | 11.0                                 | 7.6                                 | 145                                    | 8.85                                  | 30.2   | 670   | 3.62            |
| 1970 to 1974   | 9.6                | .31                                     | 6.8                                  | 7.4                                 | 92                                     | 9.55                                  | 32.6   | 709   | 4.61            |
| 1975 to 1979   | 10.5               | .44                                     | 9.3                                  | 7.2                                 | 128                                    | 12.23                                 | 41.7   | 885   | 4.48            |
| 1980 to 1984   | 7.4                | .28                                     | 5.8                                  | 7.1                                 | 82                                     | 11.10                                 | 37.9   | 793   | 6.33            |
| 1985 or After  | 3.9                | .15                                     | 3.3                                  | 7.4                                 | 45                                     | 11.70                                 | 39.9   | 868   | 7.43            |
| <b>Status of Unit</b>                                  |                    |   |                                      |                                     |  |                                       |  |       |                 |
| Owned  | 58.8               | .07                                     | 45.8                                 | 7.6                                 | 606                                    | 10.31                                 | 35.2   | 780   | 1.90            |
| Condominium  | 1.5                | .04                                     | 1.0                                  | 8.3                                 | 13                                     | 8.17                                  | 27.9   | 674   | 13.46           |
| Not a Condominium                                      | 57.2               | 2.02                                    | 44.8                                 | 7.6                                 | 593                                    | 10.37                                 | 35.4   | 783   | 1.92            |
| Rented   | 31.7               | .69                                     | 15.7                                 | 7.8                                 | 202                                    | 6.36                                  | 21.7   | 496   | 3.09            |
| Public Housing   | 2.5                | .04                                     | .9                                   | 7.2                                 | 13                                     | 5.10                                  | 17.4   | 367   | 11.68           |
| Not Public Housing                                     | 29.2               | .65                                     | 14.8                                 | 7.8                                 | 189                                    | 6.47                                  | 22.1   | 507   | 3.29            |
| Rent Subsidy   | 1.4                | .03                                     | .7                                   | 8.3                                 | 8                                      | 5.61                                  | 19.1   | 467   | 10.01           |
| No Rent Subsidy  | 27.8               | .62                                     | 14.2                                 | 7.8                                 | 181                                    | 6.52                                  | 22.2   | 509   | 3.44            |
| <b>1987 Family Income</b>                              |                    |   |                                      |                                     |  |                                       |  |       |                 |
| Less than \$5,000                                      | 6.2                | .13                                     | 2.8                                  | 7.7                                 | 37                                     | 5.93                                  | 20.2   | 457   | 5.69            |
| \$5,000 to \$9,999                                     | 11.5               | .26                                     | 5.8                                  | 7.5                                 | 76                                     | 6.66                                  | 22.7   | 502   | 4.41            |
| \$10,000 to \$14,999                                   | 12.6               | .31                                     | 6.9                                  | 7.6                                 | 91                                     | 7.18                                  | 24.5   | 548   | 3.24            |
| \$15,000 to \$19,999                                   | 9.0                | .24                                     | 5.3                                  | 7.6                                 | 70                                     | 7.77                                  | 26.5   | 589   | 3.99            |
| \$20,000 to \$24,999                                   | 8.8                | .27                                     | 5.9                                  | 7.5                                 | 79                                     | 9.05                                  | 30.9   | 675   | 3.95            |
| \$25,000 to \$34,999                                   | 16.2               | .52                                     | 11.5                                 | 7.5                                 | 153                                    | 9.43                                  | 32.2   | 711   | 2.87            |
| \$35,000 to \$49,999                                   | 13.4               | .51                                     | 11.2                                 | 7.6                                 | 149                                    | 11.15                                 | 38.0   | 842   | 3.37            |
| \$50,000 or More                                       | 12.9               | .52                                     | 12.1                                 | 7.9                                 | 153                                    | 11.88                                 | 40.5   | 937   | 3.49            |

See footnotes at end of table.

**Table 16. Household Electricity Consumption and Expenditures, 1987  
(Continued)**

| Household Characteristics                             | Electricity                    |  |                                      |                               |                                     |  |                                       |  | RSE Row Factors |
|---|--------------------------------|--|--------------------------------------|-------------------------------|-------------------------------------|--|---------------------------------------|--|-----------------|
|   | Number of Households (million) | Total Amount Consumed (quad-billion Btu) | Total Expenditures (billion dollars) | Average Price (cents per kWh) | Total Amount Consumed (billion kWh) | Average Amount Consumed (thousand kWh) | Average Amount Consumed (million Btu) | Average Expenditures per Household (dollars) |                 |
| RSE Column Factors:                                   | 1,250                          | 1,486                                    | 1,434                                | 0.416                         | 1,486                               | 0.869                                  | 0.869                                 | 0.805  |                 |
| <b>Below 100 Percent of Poverty Line</b>              | 11.8                           | 0.28                                     | 6.2                                  | 7.6                           | 81                                  | 6.91                                   | 23.6                                  | 527  | 4.24            |
| <b>Below 125 Percent of Poverty Line</b>              | 18.2                           | .44                                      | 9.8                                  | 7.6                           | 128                                 | 7.02                                   | 24.0                                  | 535  | 3.54            |
| <b>Assistance for Heating in Winter</b>               |                                |  |                                      |                               |                                     |  |                                       |  |                 |
| Yes   | 4.8                            | .10                                      | 2.4                                  | 7.8                           | 31                                  | 6.45                                   | 22.0                                  | 503  | 6.24            |
| No  | 85.7                           | 2.65                                     | 59.2                                 | 7.6                           | 777                                 | 9.06                                   | 30.9                                  | 690  | 1.43            |
| <b>Assistance for Weatherization of Residence</b>     |                                |  |                                      |                               |                                     |  |                                       |  |                 |
| Yes   | 1.0                            | .02                                      | .5                                   | 7.7                           | 6                                   | 6.27                                   | 21.4                                  | 485  | 9.53            |
| No  | 89.5                           | 2.74                                     | 61.1                                 | 7.6                           | 802                                 | 8.96                                   | 30.6                                  | 682  | 1.35            |
| <b>Household Owns or Has Regular Use of a Vehicle</b> |                                |  |                                      |                               |                                     |  |                                       |  |                 |
| Yes   | 79.4                           | 2.57                                     | 56.9                                 | 7.6                           | 753                                 | 9.48                                   | 32.4                                  | 716  | 1.48            |
| No  | 11.1                           | .19                                      | 4.7                                  | 8.6                           | 55                                  | 4.94                                   | 16.9                                  | 424  | 3.96            |
| <b>Race of Householder</b>                            |                                |  |                                      |                               |                                     |  |                                       |  |                 |
| White   | 76.6                           | 2.42                                     | 53.6                                 | 7.6                           | 709                                 | 9.25                                   | 31.6                                  | 700  | 1.42            |
| Black   | 10.9                           | .28                                      | 6.5                                  | 8.0                           | 82                                  | 7.46                                   | 25.4                                  | 593  | 6.06            |
| Other   | 3.0                            | .06                                      | 1.5                                  | 8.5                           | 18                                  | 5.94                                   | 20.3                                  | 502  | 7.92            |
| <b>Householder of Hispanic Descent</b>                |                                |  |                                      |                               |                                     |  |                                       |  |                 |
| Yes   | 5.0                            | .13                                      | 3.2                                  | 8.4                           | 38                                  | 7.57                                   | 25.8                                  | 639  | 6.31            |
| No  | 85.5                           | 2.63                                     | 58.4                                 | 7.6                           | 770                                 | 9.01                                   | 30.7                                  | 683  | 1.37            |
| <b>Age of Householder</b>                             |                                |  |                                      |                               |                                     |  |                                       |  |                 |
| Under 25 Years  | 6.5                            | .16                                      | 3.5                                  | 7.5                           | 47                                  | 7.20                                   | 24.6                                  | 540  | 5.83            |
| 25 to 34 Years  | 21.5                           | .63                                      | 14.1                                 | 7.7                           | 183                                 | 8.53                                   | 29.1                                  | 653  | 2.53            |
| 35 to 44 Years  | 18.0                           | .64                                      | 14.2                                 | 7.6                           | 187                                 | 10.38                                  | 35.4                                  | 787  | 2.63            |
| 45 to 59 Years  | 18.8                           | .68                                      | 15.0                                 | 7.6                           | 199                                 | 10.54                                  | 36.0                                  | 797  | 2.67            |
| 60 Years and Over                                     | 25.7                           | .66                                      | 14.8                                 | 7.7                           | 192                                 | 7.49                                   | 25.6                                  | 578  | 2.86            |
| <b>Household Size</b>                                 |                                |  |                                      |                               |                                     |  |                                       |  |                 |
| 1 Person  | 21.6                           | .42                                      | 9.4                                  | 7.7                           | 122                                 | 5.66                                   | 19.3                                  | 435  | 2.68            |
| 2 Persons   | 30.7                           | .92                                      | 20.4                                 | 7.6                           | 269                                 | 8.76                                   | 29.9                                  | 665  | 2.37            |
| 3 Persons   | 15.4                           | .54                                      | 11.8                                 | 7.5                           | 157                                 | 10.21                                  | 34.8                                  | 770  | 2.91            |
| 4 Persons   | 13.6                           | .53                                      | 11.7                                 | 7.6                           | 154                                 | 11.32                                  | 38.6                                  | 858  | 2.95            |
| 5 Persons   | 6.1                            | .24                                      | 5.4                                  | 7.8                           | 70                                  | 11.39                                  | 38.8                                  | 884  | 4.13            |
| 6 or More Persons                                     | 3.1                            | .12                                      | 2.9                                  | 8.0                           | 36                                  | 11.49                                  | 39.2                                  | 915  | 6.06            |
| <b>All-Electric Home</b>                              |                                |  |                                      |                               |                                     |  |                                       |  |                 |
| Yes   | 15.0                           | .81                                      | 16.1                                 | 6.8                           | 237                                 | 15.82                                  | 54.0                                  | 1,075  | 4.21            |
| No  | 75.5                           | 1.95                                     | 45.5                                 | 8.0                           | 571                                 | 7.56                                   | 25.8                                  | 602  | 1.30            |
| <b>Secondary Heating</b>                              |                                |  |                                      |                               |                                     |  |                                       |  |                 |
| Yes   | 37.4                           | 1.38                                     | 29.7                                 | 7.3                           | 405                                 | 10.85                                  | 37.0                                  | 795  | 2.27            |
| Over 33 Percent of Home's Total Heat                  | 3.2                            | .12                                      | 2.6                                  | 7.1                           | 37                                  | 11.37                                  | 38.8                                  | 808  | 6.57            |
| No  | 53.2                           | 1.37                                     | 31.9                                 | 7.9                           | 403                                 | 7.58                                   | 25.9                                  | 600  | 1.66            |

See footnotes at end of table.

**Table 16. Household Electricity Consumption and Expenditures, 1987  
(Continued)**

| <b>Household Characteristics</b>                 | <b>Electricity</b>                    |   |   |                                      |  |   |  |   | <b>RSE Row Factors</b> |
|--|---------------------------------------|---|---|--------------------------------------|--|---|--|---|------------------------|
|  | <b>Number of Households (million)</b> | <b>Total Amount Consumed (quad-billion Btu)</b> | <b>Total Expenditures (billion dollars)</b> | <b>Average Price (cents per kWh)</b> | <b>Total Amount Consumed (billion kWh)</b> | <b>Average Amount Consumed (thousand kWh)</b> | <b>Average Amount Consumed (million Btu)</b> | <b>Average Expenditures per Household (dollars)</b> |                        |
| <b>RSE Column Factors:</b>                       | <b>1.250</b>                          | <b>1.486</b>                                    | <b>1.434</b>                                | <b>0.416</b>                         | <b>1.466</b>                               | <b>0.869</b>                                  | <b>0.869</b>                                 | <b>0.805</b>  |                        |
| <b>Fuel Combinations</b>                         |                                       |   |   |                                      |  |   |  |   |                        |
| Use Natural Gas for Main Heat .....              | 50.0                                  | 1.22  | 28.6  | 8.0                                  | 356  | 7.13  | 24.3   | 572   | 2.20                   |
| Use Natural Gas to Heat Water and Have A/C ..... | 28.6                                  | .76   | 18.2  | 8.1                                  | 223  | 7.83  | 26.7   | 638   | 2.84                   |
| and Lack A/C .....                               | 16.3                                  | .27   | 6.7   | 8.4                                  | 79   | 4.86  | 16.6   | 411   | 3.43                   |
| Use Electricity to Heat Water and Have A/C ..... | 3.4                                   | .13   | 2.7   | 7.0                                  | 38   | 11.46   | 39.1   | 797   | 5.94                   |
| and Lack A/C .....                               | 1.6                                   | .05   | .9  | 6.6                                  | 14   | 8.62  | 29.4   | 570   | 6.74                   |
| Other .....                                      | .2                                    | .01   | .2  | 8.9                                  | 2  | 7.35  | 25.1   | 652   | 24.33                  |
| Use Electricity for Main Heat .....              | 17.9                                  | .90   | 18.1  | 6.9                                  | 263  | 14.69   | 50.1   | 1,010   | 4.07                   |
| Use Electricity to Heat Water and Have A/C ..... | 12.4                                  | .70   | 14.1  | 6.9                                  | 204  | 16.45   | 56.1   | 1,141   | 4.40                   |
| and Lack A/C .....                               | 3.0                                   | .13   | 2.4   | 6.1                                  | 39   | 12.97   | 44.2   | 792   | 8.53                   |
| Other .....                                      | 2.5                                   | .07   | 1.6   | 7.7                                  | 20   | 8.03  | 27.4   | 620   | 11.74                  |
| Use Fuel Oil for Main Heat .....                 | 10.9                                  | .27   | 6.9   | 8.7                                  | 79   | 7.28  | 24.8   | 633   | 4.47                   |
| Use Fuel Oil to Heat Water and Have A/C .....    | 2.6                                   | .05   | 1.7   | 10.9                                 | 16   | 5.95  | 20.3   | 646   | 10.09                  |
| and Lack A/C .....                               | 2.5                                   | .03   | 1.1   | 10.3                                 | 10   | 4.08  | 13.9   | 422   | 8.02                   |
| Use Electricity to Heat Water and Have A/C ..... | 2.0                                   | .08   | 1.7   | 7.4                                  | 23   | 11.42   | 39.0   | 848   | 7.29                   |
| and Lack A/C .....                               | 2.1                                   | .07   | 1.5   | 7.2                                  | 21   | 10.00   | 34.1   | 716   | 8.42                   |
| Other .....                                      | 1.7                                   | .03   | .9  | 9.8                                  | 10   | 5.76  | 19.7   | 567   | 7.72                   |
| Use Wood for Main Heat .....                     | 5.1                                   | .18   | 3.6   | 6.9                                  | 52   | 10.22   | 34.9   | 707   | 5.93                   |
| Use LPG for Main Heat .....                      | 4.1                                   | .12   | 2.7   | 7.5                                  | 36   | 8.66  | 29.6   | 650   | 6.96                   |
| Use Kerosene for Main Heat .....                 | 1.3                                   | .04   | .9  | 7.2                                  | 13   | 9.56  | 32.6   | 687   | 10.41                  |
| Use Coal for Main Heat .....                     | .4                                    | .01   | .2  | 6.8                                  | 3  | 7.71  | 26.3   | 524   | 24.53                  |
| No Heating Fuel/Other Fuel .....                 | .8                                    | .02   | .6  | 10.1                                 | 6  | 7.43  | 25.4   | 752   | 16.07                  |

Notes: • To obtain a Relative Standard Error (RSE) percentage for any table cell, multiply the cells corresponding column and row factors.

• Because of rounding, data may not sum to totals. • See "Glossary" for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Forms EIA-457 A, B, C, E of the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).

**Table 17. Consumption and Expenditures for Households Using Electricity as Main Heating Fuel, 1987**

| Household Characteristics                  | Electricity Used: As Main Heating Fuel                 |  |   |   |  |  |   |   |  |  |   |   | RSE Row Factors |  |
|--|--|--|---|---|--|--|---|---|--|--|---|---|-----------------|--|
|  | Num-<br>ber<br>of<br>House-<br>holds<br>(mil-<br>lion) | Avg<br>Amount<br>Con-<br>sumed<br>(thou-<br>sand<br>kWh) | Avg<br>Amount<br>Con-<br>sumed<br>(mil-<br>lion<br>Btu) | Avg<br>Expend-<br>itures<br>per<br>House-<br>hold<br>(dol-<br>lars) | Used For Air Conditioning                              |  |   |   | Not Used for Air Conditioning                          |  |   |   |                 |  |
|  |  |  |   |   | Num-<br>ber<br>of<br>House-<br>holds<br>(mil-<br>lion) | Avg<br>Amount<br>Con-<br>sumed<br>(thou-<br>sand<br>kWh) | Avg<br>Amount<br>Con-<br>sumed<br>(mil-<br>lion<br>Btu) | Avg<br>Expend-<br>itures<br>per<br>House-<br>hold<br>(dol-<br>lars) | Num-<br>ber<br>of<br>House-<br>holds<br>(mil-<br>lion) | Avg<br>Amount<br>Con-<br>sumed<br>(thou-<br>sand<br>kWh) | Avg<br>Amount<br>Con-<br>sumed<br>(mil-<br>lion<br>Btu) | Avg<br>Expend-<br>itures<br>per<br>House-<br>hold<br>(dol-<br>lars) |                 |  |
| RSE Column Factors:                        | 1.479  | 0.629  | 0.629   | 0.600   | 1.702  | 0.695  | 0.695   | 0.655   | 2.392  | 1.326  | 1.326   | 1.258   |                 |  |
| <b>Total U.S. Households .....</b>         | 17.9   | 14.69  | 50.1  | 1,010   | 14.4   | 15.40  | 52.5  | 1,077   | 3.5  | 11.78  | 40.2  | 735   | 4.55            |  |
| <b>Census Region and Division</b>          |  |  |   |   |  |  |   |   |  |  |   |   |                 |  |
| Northeast .....                            | 2.1  | 14.53  | 49.6  | 1,160   | 1.6  | 14.40  | 49.1  | 1,155   | .5   | 15.01  | 51.2  | 1,176   | 12.18           |  |
| New England .....                          | .4   | 13.26  | 45.2  | 1,055   | .2   | 13.94  | 47.6  | 1,110   | .2   | 12.38  | 42.2  | 983   | 18.87           |  |
| Middle Atlantic .....                      | 1.7  | 14.84  | 50.7  | 1,186   | 1.4  | 14.47  | 49.4  | 1,163   | .3   | 16.76  | 57.2  | 1,304   | 13.84           |  |
| Midwest .....                              | 1.5  | 18.92  | 64.5  | 1,220   | 1.1  | 19.01  | 64.9  | 1,231   | .3   | 18.61  | 63.5  | 1,185   | 12.47           |  |
| South .....                                | 10.5   | 15.27  | 52.1  | 1,058   | 9.8  | 15.64  | 53.4  | 1,086   | .8   | 10.50  | 35.8  | 690   | 5.94            |  |
| South Atlantic .....                       | 5.8  | 15.17  | 51.8  | 1,123   | 5.3  | 15.77  | 53.8  | 1,169   | .5   | 8.71   | 29.7  | 634   | 8.91            |  |
| East South Central .....                   | 2.2  | 17.32  | 59.1  | 1,001   | 2.0  | 17.77  | 60.6  | 1,028   | .2   | 13.52  | 46.1  | 765   | 6.08            |  |
| West South Central .....                   | 2.5  | 13.73  | 46.8  | 958   | 2.5  | 13.70  | 46.7  | 957   | Q  | Q  | Q   | Q   | 15.84           |  |
| West .....                                 | 3.8  | 11.53  | 39.3  | 713   | 1.8  | 12.79  | 43.6  | 865   | 2.0  | 10.34  | 35.3  | 571   | 10.10           |  |
| Mountain .....                             | .7   | 14.39  | 49.1  | 1,026   | .6   | 14.78  | 50.4  | 1,082   | .1   | 12.52  | 42.7  | 766   | 16.14           |  |
| Pacific .....                              | 3.1  | 10.85  | 37.0  | 640   | 1.2  | 11.84  | 40.4  | 760   | 1.8  | 10.19  | 34.8  | 558   | 12.33           |  |
| <b>Metropolitan Status</b>                 |  |  |   |   |  |  |   |   |  |  |   |   |                 |  |
| Metropolitan .....                         | 14.5   | 14.00  | 47.8  | 993   | 11.8   | 14.67  | 50.0  | 1,059   | 2.7  | 11.05  | 37.7  | 701   | 5.34            |  |
| Central City .....                         | 5.6  | 12.39  | 42.3  | 844   | 4.5  | 13.23  | 45.2  | 903   | 1.1  | 8.77   | 29.9  | 588   | 6.09            |  |
| Outside Central City .....                 | 8.9  | 15.01  | 51.2  | 1,086   | 7.3  | 15.55  | 53.1  | 1,155   | 1.6  | 12.53  | 42.8  | 774   | 6.96            |  |
| Nonmetropolitan .....                      | 3.4  | 17.62  | 60.1  | 1,082   | 2.6  | 18.77  | 64.0  | 1,160   | .8   | 14.12  | 48.2  | 844   | 7.22            |  |
| <b>Climate Zone</b>                        |  |  |   |   |  |  |   |   |  |  |   |   |                 |  |
| Under 2,000 CDD and--                      |  |  |   |   |  |  |   |   |  |  |   |   |                 |  |
| Over 7,000 HDD .....                       | .6   | 15.43  | 52.6  | 1,032   | .2   | 18.10  | 61.8  | 1,174   | .4   | 13.65  | 46.6  | 937   | 20.96           |  |
| 5,500 to 7,000 HDD .....                   | 2.6  | 17.24  | 58.8  | 1,099   | 1.6  | 18.60  | 63.5  | 1,223   | 1.1  | 15.22  | 51.9  | 917   | 10.29           |  |
| 4,000 to 5,499 HDD .....                   | 4.2  | 15.68  | 53.5  | 996   | 3.2  | 16.78  | 57.3  | 1,106   | 1.1  | 12.42  | 42.4  | 672   | 7.95            |  |
| Under 4,000 HDD .....                      | 4.0  | 12.87  | 43.9  | 887   | 3.3  | 14.14  | 48.3  | 963   | .7   | 6.83   | 23.3  | 527   | 9.24            |  |
| 2,000 CDD or More and --                   |  |  |   |   |  |  |   |   |  |  |   |   |                 |  |
| Under 4,000 HDD .....                      | 6.4  | 14.05  | 47.9  | 1,057   | 6.1  | 14.42  | 49.2  | 1,082   | .3   | 6.52   | 22.3  | 546   | 7.62            |  |
| <b>All Electricity Paid by Household</b>   |  |  |   |   |  |  |   |   |  |  |   |   |                 |  |
| Yes .....                                  | 16.1   | 15.28  | 52.1  | 1,047   | 13.3   | 15.83  | 54.0  | 1,105   | 2.8  | 12.71  | 43.4  | 777   | 4.83            |  |
| Budget Plan .....                          | 1.3  | 18.85  | 64.3  | 1,246   | 1.0  | 18.75  | 64.0  | 1,280   | .3   | 19.13  | 65.3  | 1,148   | 8.05            |  |
| No Budget Plan .....                       | 14.8   | 14.96  | 51.0  | 1,030   | 12.3   | 15.59  | 53.2  | 1,091   | 2.5  | 11.84  | 40.4  | 726   | 5.17            |  |
| No .....                                   | 1.8  | 9.32   | 31.8  | 667   | 1.1  | 10.22  | 34.9  | 734   | .7   | 7.83   | 26.7  | 558   | 12.87           |  |
| <b>Housing Structure by Status of Unit</b> |  |  |   |   |  |  |   |   |  |  |   |   |                 |  |
| Single-Family Detached .....               | 8.4  | 19.07  | 65.1  | 1,293   | 7.1  | 19.55  | 66.7  | 1,343   | 1.3  | 16.46  | 56.2  | 1,021   | 5.00            |  |
| Owned .....                                | 7.6  | 19.31  | 65.9  | 1,317   | 6.6  | 19.76  | 67.4  | 1,363   | 1.1  | 16.56  | 56.5  | 1,037   | 5.34            |  |
| Rented .....                               | .8   | 16.57  | 56.5  | 1,045   | .5   | 16.82  | 57.4  | 1,089   | .2   | 16.02  | 54.6  | 946   | 15.16           |  |
| Single-Family Attached .....               | 1.5  | 15.01  | 51.2  | 1,046   | 1.4  | 15.44  | 52.7  | 1,080   | Q  | Q  | Q   | Q   | 15.53           |  |
| Building of 2 to 4 Units .....             | 1.5  | 11.55  | 39.4  | 785   | .8   | 12.16  | 41.5  | 880   | .7   | 10.82  | 36.9  | 670   | 12.14           |  |
| Building of 5 or More Units .....          | 5.5  | 8.75   | 29.8  | 635   | 4.4  | 9.19   | 31.4  | 683   | 1.1  | 7.01   | 23.9  | 445   | 8.42            |  |
| Mobile Home .....                          | 1.0  | 14.87  | 50.8  | 983   | .7   | 16.01  | 54.6  | 1,080   | .3   | 12.03  | 41.1  | 739   | 11.67           |  |
| <b>Number of Rooms</b>                     |  |  |   |   |  |  |   |   |  |  |   |   |                 |  |
| 1 .....                                    | .2   | 5.46   | 18.6  | 414   | Q  | Q  | Q   | Q   | Q  | Q  | Q   | Q   | 38.68           |  |
| 2 .....                                    | .7   | 5.86   | 20.0  | 454   | .4   | 5.57   | 19.0  | 431   | .2   | 6.43   | 21.9  | 500   | 13.37           |  |
| 3 .....                                    | 3.4  | 8.84   | 30.2  | 643   | 2.5  | 9.43   | 32.2  | 712   | .9   | 7.09   | 24.2  | 442   | 8.66            |  |
| 4 .....                                    | 4.0  | 11.95  | 40.8  | 805   | 3.0  | 12.47  | 42.6  | 858   | 1.0  | 10.32  | 35.2  | 640   | 6.04            |  |
| 5 .....                                    | 3.4  | 16.04  | 54.7  | 1,073   | 2.8  | 16.54  | 56.4  | 1,127   | .6   | 13.75  | 46.9  | 820   | 6.84            |  |
| 6 .....                                    | 2.9  | 17.50  | 59.7  | 1,202   | 2.6  | 17.80  | 60.7  | 1,238   | .3   | 15.10  | 51.5  | 911   | 7.35            |  |
| 7 .....                                    | 1.8  | 20.79  | 70.9  | 1,437   | 1.5  | 20.73  | 70.7  | 1,463   | .3   | 21.10  | 72.0  | 1,298   | 8.04            |  |
| 8 or More .....                            | 1.6  | 23.85  | 81.4  | 1,638   | 1.4  | 24.29  | 82.9  | 1,682   | .2   | 20.96  | 71.5  | 1,348   | 8.83            |  |

See footnotes at end of table.

**Table 17. Consumption and Expenditures for Households Using Electricity as Main Heating Fuel, 1987 (Continued)**

| Household Characteristics                              | Electricity Used: As Main Heating Fuel |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  | RSE Row Factors |  |
|--|--|------------------------------------|-----------------------------------|--|--------------------------------|------------------------------------|-----------------------------------|--|--------------------------------|------------------------------------|-----------------------------------|--|-----------------|--|
|  | Number of Households (million)         | Avg Amount Consumed (thousand kWh) | Avg Amount Consumed (million Btu) | Avg Expenditures per Household (dollars) | Used For Air Conditioning      |                                    |                                   |  | Not Used for Air Conditioning  |                                    |                                   |  |                 |  |
|  |  |                                    |                                   |  | Number of Households (million) | Avg Amount Consumed (thousand kWh) | Avg Amount Consumed (million Btu) | Avg Expenditures per Household (dollars) | Number of Households (million) | Avg Amount Consumed (thousand kWh) | Avg Amount Consumed (million Btu) | Avg Expenditures per Household (dollars) |                 |  |
| RSE Column Factors:                                    | 1.479                                  | 0.629                              | 0.629                             | 0.600                                    | 1.702                          | 0.695                              | 0.695                             | 0.655                                    | 2.392                          | 1.326                              | 1.326                             | 1.258                                    |                 |  |
| <b>Number of Rooms That Can Be Air Conditioned</b>     |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| All .....  | 13.0                                   | 15.45                              | 52.7                              | 1,082                                    | 13.0                           | 15.45                              | 52.7                              | 1,082                                    | NC                             | NC                                 | NC                                | NC                                       | 4.76            |  |
| Some .....   | 1.4                                    | 14.87                              | 50.7                              | 1,027                                    | 1.4                            | 14.87                              | 50.7                              | 1,027                                    | NC                             | NC                                 | NC                                | NC                                       | 7.83            |  |
| None .....   | 3.5                                    | 11.78                              | 40.2                              | 735                                      | —                              | —                                  | —                                 | —  | 3.5                            | 11.78                              | 40.2                              | 735                                      | 7.11            |  |
| <b>Measured Heated Area of Residence (square feet)</b> |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Fewer than 600 .....                                   | 2.0                                    | 7.21                               | 24.6                              | 521                                      | 1.2                            | 8.07                               | 27.5                              | 578                                      | .8                             | 5.89                               | 20.1                              | 434                                      | 9.86            |  |
| 600 to 999 .....                                       | 5.3                                    | 11.34                              | 38.7                              | 786                                      | 4.1                            | 11.58                              | 39.5                              | 828                                      | 1.2                            | 10.51                              | 35.9                              | 638                                      | 7.14            |  |
| 1,000 to 1,599 .....                                   | 6.0                                    | 15.45                              | 52.7                              | 1,053                                    | 4.9                            | 15.74                              | 53.7                              | 1,095                                    | 1.0                            | 14.09                              | 46.1                              | 859                                      | 6.58            |  |
| 1,600 to 1,999 .....                                   | 2.0                                    | 18.50                              | 63.1                              | 1,254                                    | 1.7                            | 18.68                              | 63.7                              | 1,286                                    | .3                             | 17.64                              | 60.2                              | 1,093                                    | 8.20            |  |
| 2,000 to 2,399 .....                                   | 1.3                                    | 19.18                              | 65.5                              | 1,375                                    | 1.2                            | 19.36                              | 66.1                              | 1,395                                    | Q                              | Q                                  | Q                                 | Q  | 8.32            |  |
| 2,400 to 2,999 .....                                   | .8                                     | 23.38                              | 79.8                              | 1,524                                    | .6                             | 23.34                              | 79.6                              | 1,549                                    | Q                              | Q                                  | Q                                 | Q  | 8.57            |  |
| 3,000 or More .....                                    | .7                                     | 25.68                              | 87.6                              | 1,765                                    | .7                             | 25.77                              | 87.9                              | 1,771                                    | Q                              | Q                                  | Q                                 | Q  | 14.00           |  |
| <b>Year of Construction</b>                            |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| 1939 or Before .....                                   | 1.1                                    | 12.43                              | 42.4                              | 877                                      | .7                             | 14.03                              | 47.9                              | 976                                      | .4                             | 9.74                               | 33.2                              | 709                                      | 14.63           |  |
| 1940 to 1949 .....                                     | .6                                     | 14.98                              | 51.1                              | 1,029                                    | .5                             | 15.50                              | 52.9                              | 1,078                                    | .1                             | 13.03                              | 44.5                              | 847                                      | 15.58           |  |
| 1950 to 1959 .....                                     | 1.1                                    | 14.59                              | 49.8                              | 983                                      | .9                             | 15.54                              | 53.0                              | 1,056                                    | .3                             | 11.64                              | 39.7                              | 756                                      | 13.40           |  |
| 1960 to 1969 .....                                     | 2.5                                    | 14.47                              | 49.4                              | 941                                      | 1.9                            | 16.01                              | 54.6                              | 1,045                                    | .6                             | 9.59                               | 32.7                              | 612                                      | 8.87            |  |
| 1970 to 1974 .....                                     | 2.4                                    | 14.42                              | 49.2                              | 984                                      | 1.9                            | 15.64                              | 53.4                              | 1,092                                    | .5                             | 9.68                               | 33.0                              | 564                                      | 13.23           |  |
| 1975 to 1979 .....                                     | 4.6                                    | 15.43                              | 52.7                              | 1,057                                    | 3.8                            | 15.80                              | 53.9                              | 1,107                                    | .8                             | 13.74                              | 46.9                              | 827                                      | 9.59            |  |
| 1980 to 1984 .....                                     | 3.4                                    | 14.58                              | 49.7                              | 1,010                                    | 2.7                            | 14.70                              | 50.1                              | 1,056                                    | .6                             | 14.07                              | 48.0                              | 814                                      | 8.89            |  |
| 1985 or After .....                                    | 2.1                                    | 14.92                              | 50.9                              | 1,092                                    | 2.0                            | 15.14                              | 51.7                              | 1,106                                    | Q                              | Q                                  | Q                                 | Q  | 9.70            |  |
| <b>Status of Unit</b>                                  |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Owned .....  | 10.1                                   | 17.96                              | 61.3                              | 1,232                                    | 8.7                            | 18.35                              | 62.6                              | 1,273                                    | 1.4                            | 15.57                              | 53.1                              | 978                                      | 5.29            |  |
| Condominium .....                                      | .7                                     | 10.57                              | 36.1                              | 836                                      | .7                             | 10.59                              | 36.1                              | 835                                      | Q                              | Q                                  | Q                                 | Q  | 16.91           |  |
| Not a Condominium .....                                | 9.4                                    | 18.54                              | 63.3                              | 1,263                                    | 8.0                            | 19.04                              | 64.9                              | 1,312                                    | 1.4                            | 15.66                              | 53.4                              | 980                                      | 5.20            |  |
| Rented .....   | 7.8                                    | 10.43                              | 35.6                              | 721                                      | 5.7                            | 10.86                              | 37.1                              | 776                                      | 2.1                            | 9.26                               | 31.6                              | 573                                      | 6.75            |  |
| Public Housing .....                                   | .7                                     | 8.73                               | 29.8                              | 555                                      | .4                             | 9.10                               | 31.1                              | 630                                      | .3                             | 8.29                               | 28.3                              | 468                                      | 22.38           |  |
| Not Public Housing .....                               | 7.1                                    | 10.59                              | 36.1                              | 736                                      | 5.3                            | 10.98                              | 37.5                              | 785                                      | 1.8                            | 9.42                               | 32.1                              | 591                                      | 7.49            |  |
| Rent Subsidy .....                                     | .3                                     | 9.43                               | 32.2                              | 675                                      | .2                             | 9.27                               | 31.6                              | 678                                      | Q                              | 9.79                               | 33.4                              | 668                                      | 20.93           |  |
| No Rent Subsidy .....                                  | 6.8                                    | 10.64                              | 36.3                              | 739                                      | 5.1                            | 11.06                              | 37.7                              | 790                                      | 1.7                            | 9.40                               | 32.1                              | 586                                      | 7.82            |  |
| <b>1987 Family Income</b>                              |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Less than \$5,000 .....                                | 1.2                                    | 9.83                               | 33.5                              | 667                                      | .8                             | 10.75                              | 36.7                              | 728                                      | .4                             | 7.71                               | 26.3                              | 526                                      | 14.61           |  |
| \$5,000 to \$9,999 .....                               | 1.8                                    | 12.13                              | 41.4                              | 798                                      | 1.3                            | 13.39                              | 45.7                              | 888                                      | .6                             | 9.29                               | 31.7                              | 595                                      | 9.55            |  |
| \$10,000 to \$14,999 .....                             | 2.0                                    | 11.60                              | 39.6                              | 763                                      | 1.5                            | 11.94                              | 40.7                              | 808                                      | .5                             | 10.51                              | 35.9                              | 621                                      | 7.96            |  |
| \$15,000 to \$19,999 .....                             | 1.8                                    | 12.12                              | 41.3                              | 851                                      | 1.4                            | 11.99                              | 40.9                              | 861                                      | .4                             | 12.62                              | 43.1                              | 813                                      | 10.48           |  |
| \$20,000 to \$24,999 .....                             | 1.8                                    | 15.38                              | 52.5                              | 995                                      | 1.4                            | 15.70                              | 53.6                              | 1,039                                    | .4                             | 14.15                              | 48.3                              | 822                                      | 8.96            |  |
| \$25,000 to \$34,999 .....                             | 3.5                                    | 14.71                              | 50.2                              | 1,027                                    | 3.0                            | 15.43                              | 52.6                              | 1,082                                    | .5                             | 10.58                              | 36.1                              | 710                                      | 7.85            |  |
| \$35,000 to \$49,999 .....                             | 3.1                                    | 17.51                              | 59.8                              | 1,222                                    | 2.6                            | 17.67                              | 60.3                              | 1,266                                    | .5                             | 16.63                              | 56.7                              | 976                                      | 10.23           |  |
| \$50,000 or More .....                                 | 2.7                                    | 18.65                              | 63.6                              | 1,324                                    | 2.3                            | 19.61                              | 66.9                              | 1,408                                    | .4                             | 13.19                              | 45.0                              | 841                                      | 10.64           |  |
| <b>Below 100 Percent of Poverty Line</b>               |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Below 100 Percent of Poverty Line .....                | 2.0                                    | 11.82                              | 40.3                              | 791                                      | 1.4                            | 12.99                              | 44.3                              | 874                                      | .6                             | 9.06                               | 30.9                              | 596                                      | 10.57           |  |
| <b>Below 125 Percent of Poverty Line</b>               |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Below 125 Percent of Poverty Line .....                | 3.0                                    | 11.94                              | 40.7                              | 787                                      | 2.1                            | 13.28                              | 45.3                              | 878                                      | .9                             | 8.86                               | 30.2                              | 580                                      | 8.67            |  |

See footnotes at end of table.

**Table 17. Consumption and Expenditures for Households Using Electricity as Main Heating Fuel, 1987 (Continued)**

| Household Characteristics                             | Electricity Used: As Main Heating Fuel |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  | RSE Row Factors |  |
|---|--|------------------------------------|-----------------------------------|--|--------------------------------|------------------------------------|-----------------------------------|--|--------------------------------|------------------------------------|-----------------------------------|--|-----------------|--|
|   | Number of Households (million)         | Avg Amount Consumed (thousand kWh) | Avg Amount Consumed (million Btu) | Avg Expenditures per Household (dollars) | Used For Air Conditioning      |                                    |                                   |  | Not Used for Air Conditioning  |                                    |                                   |  |                 |  |
|   |  |                                    |                                   |  | Number of Households (million) | Avg Amount Consumed (thousand kWh) | Avg Amount Consumed (million Btu) | Avg Expenditures per Household (dollars) | Number of Households (million) | Avg Amount Consumed (thousand kWh) | Avg Amount Consumed (million Btu) | Avg Expenditures per Household (dollars) |                 |  |
| RSE Column Factors:                                   | 1.479                                  | 0.629                              | 0.629                             | 0.600                                    | 1.702                          | 0.695                              | 0.695                             | 0.655                                    | 2.392                          | 1.326                              | 1.326                             | 1.258                                    |                 |  |
| <b>Assistance for Heating in Winter</b>               |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Yes .....   | 0.5                                    | 12.58                              | 42.9                              | 807                                      | 0.4                            | 14.46                              | 49.3                              | 933                                      | 0.2                            | 8.08                               | 27.6                              | 504                                      | 17.71           |  |
| No .....  | 17.4                                   | 14.75                              | 50.3                              | 1,016                                    | 14.0                           | 15.42                              | 52.6                              | 1,081                                    | 3.4                            | 11.95                              | 40.8                              | 745                                      | 4.67            |  |
| <b>Assistance for Weatherization of Residence</b>     |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Yes .....   | Q                                      | 10.78                              | 36.8                              | 692                                      | Q                              | Q                                  | Q                                 | Q  | Q                              | Q                                  | Q                                 | Q  | 56.62           |  |
| No .....  | 17.8                                   | 14.70                              | 50.2                              | 1,011                                    | 14.4                           | 15.40                              | 52.5                              | 1,077                                    | 3.5                            | 11.83                              | 40.4                              | 738                                      | 4.57            |  |
| <b>Household Owns or Has Regular Use of a Vehicle</b> |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Yes .....   | 16.4                                   | 15.13                              | 51.6                              | 1,040                                    | 13.4                           | 15.74                              | 53.7                              | 1,102                                    | 3.0                            | 12.36                              | 42.2                              | 762                                      | 4.72            |  |
| No .....  | 1.5                                    | 9.93                               | 33.9                              | 686                                      | 1.0                            | 10.69                              | 36.5                              | 742                                      | .5                             | 8.49                               | 29.0                              | 580                                      | 14.62           |  |
| <b>Race of Householder</b>                            |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| White .....   | 16.0                                   | 14.77                              | 50.4                              | 1,012                                    | 13.0                           | 15.37                              | 52.4                              | 1,074                                    | 3.0                            | 12.16                              | 41.5                              | 744                                      | 4.62            |  |
| Black .....   | 1.4                                    | 14.82                              | 50.6                              | 1,045                                    | 1.1                            | 16.16                              | 55.1                              | 1,140                                    | .3                             | 9.03                               | 30.8                              | 632                                      | 14.31           |  |
| Other .....   | .5                                     | 11.69                              | 39.9                              | 834                                      | .3                             | 13.23                              | 45.2                              | 926                                      | .2                             | 10.04                              | 34.3                              | 737                                      | 19.57           |  |
| <b>Householder of Hispanic Descent</b>                |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Yes .....   | .9                                     | 15.13                              | 51.6                              | 1,198                                    | .7                             | 16.11                              | 55.0                              | 1,290                                    | .2                             | 10.67                              | 36.4                              | 780                                      | 22.10           |  |
| No .....  | 17.0                                   | 14.66                              | 50.0                              | 1,000                                    | 13.7                           | 15.36                              | 52.4                              | 1,066                                    | 3.4                            | 11.83                              | 40.4                              | 733                                      | 4.41            |  |
| <b>Age of Householder</b>                             |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Under 25 Years .....                                  | 2.0                                    | 10.91                              | 37.2                              | 772                                      | 1.6                            | 11.48                              | 39.2                              | 827                                      | .4                             | 8.71                               | 29.7                              | 563                                      | 12.17           |  |
| 25 to 34 Years .....                                  | 4.7                                    | 13.59                              | 46.4                              | 944                                      | 3.9                            | 14.12                              | 48.2                              | 990                                      | .8                             | 10.83                              | 37.0                              | 708                                      | 5.72            |  |
| 35 to 44 Years .....                                  | 4.1                                    | 16.80                              | 57.3                              | 1,166                                    | 3.5                            | 17.02                              | 58.1                              | 1,205                                    | .6                             | 15.55                              | 53.0                              | 942                                      | 6.53            |  |
| 45 to 59 Years .....                                  | 3.4                                    | 17.17                              | 58.6                              | 1,171                                    | 2.7                            | 18.36                              | 62.7                              | 1,271                                    | .7                             | 12.47                              | 42.5                              | 781                                      | 7.65            |  |
| 60 Years and Over .....                               | 3.7                                    | 13.53                              | 46.2                              | 903                                      | 2.7                            | 14.49                              | 49.4                              | 991                                      | 1.0                            | 11.03                              | 37.6                              | 671                                      | 8.21            |  |
| <b>Household Size</b>                                 |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| 1 Person .....  | 4.9                                    | 10.01                              | 34.2                              | 680                                      | 3.7                            | 10.36                              | 35.3                              | 725                                      | 1.2                            | 8.92                               | 30.4                              | 538                                      | 6.79            |  |
| 2 Persons .....                                       | 6.6                                    | 14.02                              | 47.8                              | 967                                      | 5.2                            | 14.88                              | 50.8                              | 1,048                                    | 1.4                            | 10.76                              | 36.7                              | 662                                      | 5.58            |  |
| 3 Persons .....                                       | 2.9                                    | 17.59                              | 60.0                              | 1,221                                    | 2.4                            | 17.91                              | 61.1                              | 1,249                                    | .4                             | 15.75                              | 53.7                              | 1,065                                    | 7.01            |  |
| 4 Persons .....                                       | 2.4                                    | 18.96                              | 64.7                              | 1,311                                    | 2.1                            | 19.22                              | 65.6                              | 1,349                                    | .4                             | 17.51                              | 59.8                              | 1,092                                    | 9.02            |  |
| 5 Persons .....                                       | .7                                     | 22.65                              | 78.0                              | 1,526                                    | .7                             | 23.16                              | 79.0                              | 1,540                                    | Q                              | Q                                  | Q                                 | Q  | 8.79            |  |
| 6 or More Persons .....                               | .4                                     | 21.51                              | 73.4                              | 1,485                                    | .3                             | 22.77                              | 77.7                              | 1,631                                    | .1                             | 18.12                              | 61.8                              | 1,093                                    | 17.19           |  |
| <b>All-Electric Home</b>                              |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Yes .....   | 15.0                                   | 15.82                              | 54.0                              | 1,075                                    | 12.1                           | 16.48                              | 56.2                              | 1,142                                    | 2.8                            | 13.04                              | 44.5                              | 793                                      | 4.65            |  |
| No .....  | 2.9                                    | 8.89                               | 30.3                              | 675                                      | 2.3                            | 9.63                               | 32.8                              | 730                                      | .7                             | 6.40                               | 21.8                              | 487                                      | 11.08           |  |
| <b>Secondary Heating</b>                              |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Yes .....   | 7.4                                    | 17.34                              | 59.2                              | 1,169                                    | 5.9                            | 18.24                              | 62.2                              | 1,259                                    | 1.5                            | 13.76                              | 47.0                              | 808                                      | 6.61            |  |
| Over 33 Percent of Home's Total Heat .....            | .8                                     | 16.77                              | 57.2                              | 1,133                                    | .6                             | 18.76                              | 64.0                              | 1,333                                    | .3                             | 12.34                              | 42.1                              | 687                                      | 13.24           |  |
| No .....  | 10.5                                   | 12.82                              | 43.7                              | 898                                      | 8.5                            | 13.41                              | 45.8                              | 950                                      | 2.0                            | 10.34                              | 35.3                              | 682                                      | 4.97            |  |

See footnotes at end of table.

**Table 17. Consumption and Expenditures for Households Using Electricity as Main Heating Fuel, 1987 (Continued)**

| Household Characteristics                       | Electricity Used: As Main Heating Fuel |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  | RSE Row Factors |  |
|---|--|------------------------------------|-----------------------------------|--|--------------------------------|------------------------------------|-----------------------------------|--|--------------------------------|------------------------------------|-----------------------------------|--|-----------------|--|
|   | Number of Households (million)         | Avg Amount Consumed (thousand kWh) | Avg Amount Consumed (million Btu) | Avg Expenditures per Household (dollars) | Used For Air Conditioning      |                                    |                                   |  | Not Used for Air Conditioning  |                                    |                                   |  |                 |  |
|   |  |                                    |                                   |  | Number of Households (million) | Avg Amount Consumed (thousand kWh) | Avg Amount Consumed (million Btu) | Avg Expenditures per Household (dollars) | Number of Households (million) | Avg Amount Consumed (thousand kWh) | Avg Amount Consumed (million Btu) | Avg Expenditures per Household (dollars) |                 |  |
| RSE Column Factors:                             | 1.479                                  | 0.629                              | 0.629                             | 0.600                                    | 1.702                          | 0.695                              | 0.695                             | 0.655                                    | 2.392                          | 1.326                              | 1.326                             | 1.258                                    |                 |  |
| <b>Main Heating Equipment Using Electricity</b> |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Central Warm Air Furnace .....                  | 6.9                                    | 14.68                              | 50.1                              | 1,005                                    | 6.2                            | 14.74                              | 50.3                              | 1,019                                    | 0.7                            | 14.06                              | 48.0                              | 865                                      | 7.89            |  |
| Built-In Electric Units .....                   | 5.4                                    | 13.80                              | 47.1                              | 921                                      | 3.0                            | 15.38                              | 52.5                              | 1,082                                    | 2.4                            | 11.85                              | 40.4                              | 722                                      | 7.60            |  |
| Heat Pump .....                                 | 4.5                                    | 16.53                              | 56.4                              | 1,171                                    | 4.5                            | 16.53                              | 56.4                              | 1,172                                    | --                             | --                                 | --                                | 6.21                                     |                 |  |
| Other .....                                     | 1.1                                    | 11.44                              | 39.0                              | 807                                      | .7                             | 13.79                              | 47.0                              | 938                                      | .4                             | 7.80                               | 26.6                              | 604                                      | 11.91           |  |

NC No cases in sample.

-- Data not applicable.

o Data withheld either because the RSE was greater than 50 percent or fewer than 10 households were sampled.

Notes: • To obtain a Relative Standard Error (RSE) percentage for any table cell, multiply the cells corresponding column and row factors.

• Because of rounding, data may not sum to totals. • See "Glossary" for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Forms EIA-457 A, B, C, E of the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).

**Table 18. Electricity Consumption and Expenditures for Households Not Using Electricity as Main Heating Fuel, 1987**

| Household Characteristics                  | Electricity Used: Not As Main Heating Fuel |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  | RSE Row Factors |  |
|--|--|------------------------------------|-----------------------------------|--|--------------------------------|------------------------------------|-----------------------------------|--|--------------------------------|------------------------------------|-----------------------------------|--|-----------------|--|
|  | Number of Households (million)             | Avg Amount Consumed (thousand kWh) | Avg Amount Consumed (million Btu) | Avg Expenditures per Household (dollars) | Used For Air Conditioning      |                                    |                                   |  | Not Used for Air Conditioning  |                                    |                                   |  |                 |  |
|  |  |                                    |                                   |  | Number of Households (million) | Avg Amount Consumed (thousand kWh) | Avg Amount Consumed (million Btu) | Avg Expenditures per Household (dollars) | Number of Households (million) | Avg Amount Consumed (thousand kWh) | Avg Amount Consumed (million Btu) | Avg Expenditures per Household (dollars) |                 |  |
| RSE Column Factors:                        | 1.220                                      | 0.720                              | 0.720                             | 0.704                                    | 1.785                          | 0.931                              | 0.931                             | 0.886                                    | 1.930                          | 0.955                              | 0.955                             | 0.930                                    |                 |  |
| Total U.S. Households .....                | 72.6                                       | 7.5                                | 25.6                              | 599                                      | 42.7                           | 8.6                                | 29.2                              | 683                                      | 29.9                           | 6.0                                | 20.5                              | 480                                      | 1.77            |  |
| <b>Census Region and Division</b>          |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Northeast .....                            | 16.9                                       | 5.9                                | 20.1                              | 584                                      | 8.7                            | 6.6                                | 22.6                              | 673                                      | 8.3                            | 5.1                                | 17.4                              | 491                                      | 3.25            |  |
| New England .....                          | 3.9  | 6.0                                | 20.5                              | 551                                      | 1.6                            | 6.8                                | 23.0                              | 612                                      | 2.2                            | 5.5                                | 18.7                              | 508                                      | 4.84            |  |
| Middle Atlantic .....                      | 13.1                                       | 5.8                                | 19.9                              | 594                                      | 7.1                            | 6.6                                | 22.5                              | 687                                      | 6.0                            | 4.9                                | 16.9                              | 485                                      | 4.14            |  |
| Midwest .....                              | 20.8                                       | 7.3                                | 24.8                              | 591                                      | 13.9                           | 7.7                                | 26.3                              | 634                                      | 6.9                            | 6.4                                | 21.8                              | 504                                      | 3.24            |  |
| East North Central .....                   | 14.8                                       | 6.9                                | 23.6                              | 583                                      | 9.2                            | 7.2                                | 24.7                              | 624                                      | 5.6                            | 6.4                                | 22.0                              | 517                                      | 4.30            |  |
| West North Central .....                   | 6.0  | 8.1                                | 27.6                              | 612                                      | 4.8                            | 8.6                                | 29.4                              | 655                                      | 1.2                            | 6.1                                | 20.9                              | 447                                      | 5.15            |  |
| South .....                                | 20.4                                       | 9.6                                | 32.9                              | 686                                      | 15.5                           | 10.7                               | 36.5                              | 754                                      | 4.9                            | 6.3                                | 21.6                              | 474                                      | 4.15            |  |
| South Atlantic .....                       | 9.8  | 9.2                                | 31.4                              | 672                                      | 7.0                            | 10.1                               | 34.4                              | 735                                      | 2.7                            | 6.9                                | 23.5                              | 512                                      | 6.22            |  |
| East South Central .....                   | 3.9  | 10.2                               | 34.9                              | 630                                      | 3.2                            | 11.1                               | 38.0                              | 678                                      | .7                             | 6.3                                | 21.6                              | 424                                      | 6.42            |  |
| West South Central .....                   | 6.7  | 10.0                               | 34.0                              | 740                                      | 5.3                            | 11.2                               | 38.2                              | 824                                      | 1.4                            | 5.3                                | 18.1                              | 424                                      | 6.60            |  |
| West .....                                 | 14.5                                       | 6.7                                | 23.0                              | 505                                      | 4.6                            | 7.6                                | 26.0                              | 607                                      | 9.9                            | 6.3                                | 21.6                              | 457                                      | 3.20            |  |
| Mountain .....                             | 3.7  | 6.9                                | 23.6                              | 506                                      | .9                             | 8.0                                | 27.3                              | 625                                      | 2.8                            | 6.6                                | 22.4                              | 465                                      | 5.88            |  |
| Pacific .....                              | 10.8                                       | 6.7                                | 22.8                              | 504                                      | 3.7                            | 7.5                                | 25.7                              | 603                                      | 7.1                            | 6.2                                | 21.3                              | 453                                      | 3.81            |  |
| <b>Metropolitan Status</b>                 |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Metropolitan .....                         | 55.7                                       | 7.2                                | 24.6                              | 595                                      | 33.6                           | 8.3                                | 28.3                              | 682                                      | 22.1                           | 5.6                                | 19.1                              | 463                                      | 2.14            |  |
| Central City .....                         | 24.1                                       | 6.1                                | 20.8                              | 517                                      | 13.3                           | 7.3                                | 25.1                              | 614                                      | 10.8                           | 4.6                                | 15.6                              | 397                                      | 3.09            |  |
| Outside Central City .....                 | 31.7                                       | 8.1                                | 27.5                              | 655                                      | 20.4                           | 8.9                                | 30.4                              | 726                                      | 11.3                           | 6.6                                | 22.4                              | 527                                      | 2.86            |  |
| Nonmetropolitan .....                      | 16.9                                       | 8.4                                | 28.8                              | 611                                      | 9.0                            | 9.6                                | 32.6                              | 684                                      | 7.8                            | 7.1                                | 24.4                              | 527                                      | 3.29            |  |
| <b>Climate Zone</b>                        |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Under 2,000 CDD and--                      |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Over 7,000 HDD .....                       | 7.9  | 7.4                                | 25.2                              | 527                                      | 3.1                            | 7.9                                | 26.8                              | 553                                      | 4.8                            | 7.1                                | 24.3                              | 511                                      | 4.50            |  |
| 5,500 to 7,000 HDD .....                   | 23.3                                       | 6.7                                | 22.8                              | 575                                      | 13.3                           | 7.1                                | 24.4                              | 630                                      | 10.0                           | 6.0                                | 20.6                              | 503                                      | 3.83            |  |
| 4,000 to 5,499 HDD .....                   | 17.7                                       | 7.3                                | 25.1                              | 602                                      | 11.7                           | 7.9                                | 27.1                              | 663                                      | 6.0                            | 6.2                                | 21.1                              | 485                                      | 5.00            |  |
| Under 4,000 HDD .....                      | 13.8                                       | 7.4                                | 25.2                              | 571                                      | 7.3                            | 9.3                                | 31.9                              | 706                                      | 6.5                            | 5.2                                | 17.8                              | 420                                      | 5.19            |  |
| 2,000 CDD or More and --                   |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Under 4,000 HDD .....                      | 9.9  | 10.0                               | 34.0                              | 746                                      | 7.4                            | 11.6                               | 39.5                              | 841                                      | 2.6                            | 5.4                                | 18.3                              | 475                                      | 5.42            |  |
| <b>All Electricity Paid by Household</b>   |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Yes .....                                  | 67.1                                       | 7.8                                | 26.5                              | 620                                      | 40.4                           | 8.8                                | 29.9                              | 700                                      | 26.7                           | 6.3                                | 21.4                              | 500                                      | 1.81            |  |
| No .....                                   | 5.5  | 4.3                                | 14.8                              | 344                                      | 2.3                            | 5.0                                | 17.1                              | 382                                      | 3.2                            | 3.8                                | 13.0                              | 316                                      | 7.99            |  |
| <b>Housing Structure by Status of Unit</b> |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Single-Family Detached .....               | 46.8                                       | 8.9                                | 30.4                              | 691                                      | 28.0                           | 10.1                               | 34.5                              | 784                                      | 18.8                           | 7.1                                | 24.3                              | 552                                      | 2.16            |  |
| Owned .....                                | 40.1                                       | 9.2                                | 31.3                              | 711                                      | 25.0                           | 10.3                               | 35.0                              | 795                                      | 15.0                           | 7.4                                | 25.1                              | 570                                      | 2.23            |  |
| Rented .....                               | 6.7  | 7.4                                | 25.3                              | 571                                      | 3.0                            | 9.0                                | 30.9                              | 687                                      | 3.7                            | 6.1                                | 20.8                              | 478                                      | 4.69            |  |
| Single-Family Attached .....               | 3.8  | 6.4                                | 22.0                              | 591                                      | 2.5                            | 7.1                                | 24.1                              | 660                                      | 1.4                            | 5.3                                | 18.1                              | 464                                      | 10.02           |  |
| Owned .....                                | 2.9  | 6.3                                | 21.5                              | 597                                      | 1.8                            | 6.9                                | 23.5                              | 677                                      | 1.1                            | 5.4                                | 18.3                              | 467                                      | 10.52           |  |
| Rented .....                               | 1.0  | 6.9                                | 23.5                              | 573                                      | .7                             | 7.5                                | 25.7                              | 618                                      | .3                             | 5.2                                | 17.7                              | 455                                      | 18.86           |  |
| Building of 2 to 4 Units .....             | 8.5  | 4.7                                | 16.1                              | 429                                      | 4.0                            | 5.5                                | 18.8                              | 510                                      | 4.6                            | 4.0                                | 13.7                              | 360                                      | 5.72            |  |
| Owned .....                                | 1.9  | 5.8                                | 19.8                              | 554                                      | 1.1                            | 6.2                                | 21.0                              | 615                                      | .8                             | 5.3                                | 18.1                              | 465                                      | 10.17           |  |
| Rented .....                               | 6.7  | 4.4                                | 15.0                              | 395                                      | 2.8                            | 5.3                                | 18.0                              | 469                                      | 3.8                            | 3.8                                | 12.8                              | 339                                      | 6.49            |  |
| Building of 5 or More Units .....          | 9.4  | 3.5                                | 11.9                              | 320                                      | 5.9                            | 3.9                                | 13.1                              | 355                                      | 3.5                            | 2.8                                | 9.7                               | 262                                      | 6.18            |  |
| Owned .....                                | .5   | 4.8                                | 16.4                              | 510                                      | .4                             | 4.5                                | 15.3                              | 525                                      | Q                              | Q                                  | Q                                 | Q  | 24.15           |  |
| Rented .....                               | 8.9  | 3.4                                | 11.6                              | 309                                      | 5.5                            | 3.8                                | 13.0                              | 342                                      | 3.4                            | 2.7                                | 9.4                               | 256                                      | 6.10            |  |
| Mobile Home .....                          | 4.1  | 7.5                                | 25.5                              | 554                                      | 2.4                            | 8.3                                | 28.3                              | 611                                      | 1.7                            | 6.3                                | 21.5                              | 474                                      | 6.25            |  |
| Owned .....                                | 3.3  | 7.6                                | 26.0                              | 564                                      | 2.0                            | 8.4                                | 28.7                              | 618                                      | 1.4                            | 6.5                                | 22.2                              | 485                                      | 7.19            |  |
| Rented .....                               | .7   | 6.8                                | 23.2                              | 508                                      | .4                             | 7.8                                | 26.8                              | 576                                      | .3                             | 5.5                                | 18.9                              | 429                                      | 12.48           |  |

See footnotes at end of table.

## NOT ELECTRICALLY HEATED

**Table 18. Electricity Consumption and Expenditures for Households Not Using Electricity as Main Heating Fuel, 1987 (Continued)**

| Household Characteristics                       | RSE Column Factors* | Electricity Used: Not As Main Heating Fuel |                                    |   |                    |                                     |                                    |   |                    |                                     |                                    |
|---|---------------------|--|------------------------------------|---|--------------------|-------------------------------------|------------------------------------|---|--------------------|-------------------------------------|------------------------------------|
|   |                     | Used For Air Conditioning                  |                                    |   |                    |                                     | Not Used for Air Conditioning      |   |                    |                                     |                                    |
|   |                     | Avg. Amount Consumed (thousand kWh)        | Avg. Amount Consumed (million Btu) | Avg. Expenditures per Household (dollars) | Num. of Households | Avg. Amount Consumed (thousand kWh) | Avg. Amount Consumed (million Btu) | Avg. Expenditures per Household (dollars) | Num. of Households | Avg. Amount Consumed (thousand kWh) | Avg. Amount Consumed (million Btu) |
| Number of Rooms                                 |                     |  |                                    |   |                    |                                     |                                    |   |                    |                                     |                                    |
| 1   | 0.5                 | 2.8  | 9.5                                | 272                                       | Q                  | 4.4                                 | 15.0                               | 446                                       | 0.3                | 1.5                                 | 5.1                                |
| 2   | 1.7                 | 2.6  | 9.0                                | 217                                       | 0.7                | 3.3                                 | 11.1                               | 277                                       | 1.0                | 2.2                                 | 132                                |
| 3   | 6.5                 | 12.6                                       | 315                                | 3.3                                       | 4.1                | 13.9                                | 354                                | 3.2                                       | 3.3                | 11.2                                | 227                                |
| 4   | 13.8                | 5.5  | 18.9                               | 445                                       | 7.6                | 6.0                                 | 20.5                               | 485                                       | 6.2                | 5.0                                 | 16.9                               |
| 5   | 17.5                | 7.2  | 24.4                               | 665                                       | 10.1               | 8.0                                 | 27.3                               | 622                                       | 7.4                | 6.0                                 | 20.5                               |
| 6   | 14.5                | 8.5  | 29.0                               | 687                                       | 8.8                | 9.5                                 | 32.6                               | 771                                       | 5.7                | 6.9                                 | 23.5                               |
| 7   | 9.4                 | 9.6  | 32.7                               | 762                                       | 5.9                | 10.8                                | 37.0                               | 858                                       | 3.5                | 7.5                                 | 25.5                               |
| 8 or More                                       | 8.8                 | 11.4                                       | 38.9                               | 890                                       | 6.1                | 12.2                                | 41.7                               | 967                                       | 2.7                | 9.6                                 | 32.6                               |
|   |                     |  |                                    |   |                    |                                     |                                    |   |                    |                                     | 720                                |
|   |                     |  |                                    |   |                    |                                     |                                    |   |                    |                                     | 3.57                               |
| Number of Rooms That Can Be Air Conditioned     |                     |  |                                    |   |                    |                                     |                                    |   |                    |                                     |                                    |
| All   | 27.8                | 9.4  | 32.0                               | 727                                       | 27.3               | 9.4                                 | 32.2                               | 731                                       | .5                 | 6.0                                 | 20.4                               |
| Some  | 15.4                | 7.0  | 23.8                               | 596                                       | 15.4               | 7.0                                 | 23.8                               | 596                                       | Q                  | Q                                   | 500                                |
| None  | 29.4                | 6.0  | 20.5                               | 480                                       | —                  | —                                   | —                                  | —   | 20.5               | Q                                   | 480                                |
|   |                     |  |                                    |   |                    |                                     |                                    |   |                    | Q                                   | 2.10                               |
| Measured Heated Area of Residence (square feet) |                     |  |                                    |   |                    |                                     |                                    |   |                    |                                     |                                    |
| Fewer than 600                                  | 6.4                 | 4.1  | 14.0                               | 368                                       | 2.4                | 5.1                                 | 17.5                               | 439                                       | 4.0                | 3.5                                 | 12.0                               |
| 600 to 999                                      | 18.6                | 5.4  | 18.4                               | 438                                       | 10.7               | 5.9                                 | 20.2                               | 478                                       | 7.9                | 4.7                                 | 16.0                               |
| 1,000 to 1,599                                  | 19.6                | 7.7  | 26.1                               | 594                                       | 11.3               | 8.5                                 | 29.0                               | 655                                       | 8.3                | 6.5                                 | 22.2                               |
| 1,600 to 1,999                                  | 9.2                 | 8.6  | 29.5                               | 691                                       | 6.1                | 9.6                                 | 32.8                               | 773                                       | 3.2                | 6.8                                 | 23.1                               |
| 2,000 to 2,399                                  | 7.2                 | 9.3  | 31.6                               | 734                                       | 4.7                | 10.0                                | 34.2                               | 806                                       | 2.5                | 7.8                                 | 26.7                               |
| 2,400 to 2,999                                  | 7.0                 | 9.7  | 33.1                               | 778                                       | 4.3                | 11.0                                | 37.4                               | 888                                       | 2.7                | 7.7                                 | 26.2                               |
| 3,000 or More                                   | 4.5                 | 11.9                                       | 40.4                               | 936                                       | 3.2                | 12.8                                | 43.6                               | 1,023                                     | 1.3                | 9.7                                 | 33.0                               |
|   |                     |  |                                    |   |                    |                                     |                                    |   |                    |                                     | 731                                |
| Year of Construction                            |                     |  |                                    |   |                    |                                     |                                    |   |                    |                                     |                                    |
| 1939 or Before                                  | 20.4                | 6.3  | 21.4                               | 527                                       | 9.3                | 7.4                                 | 25.3                               | 625                                       | 11.1               | 5.3                                 | 18.2                               |
| 1940 to 1949                                    | 7.6                 | 7.0  | 24.0                               | 555                                       | 4.1                | 8.4                                 | 28.8                               | 652                                       | 3.5                | 5.4                                 | 18.5                               |
| 1950 to 1959                                    | 11.9                | 7.9  | 27.1                               | 637                                       | 7.3                | 8.9                                 | 30.5                               | 725                                       | 4.6                | 6.4                                 | 21.7                               |
| 1960 to 1969                                    | 13.9                | 7.8  | 26.8                               | 621                                       | 9.4                | 8.8                                 | 29.9                               | 690                                       | 4.5                | 5.9                                 | 20.3                               |
| 1970 to 1974                                    | 7.2                 | 7.9  | 27.1                               | 618                                       | 5.0                | 8.5                                 | 29.0                               | 668                                       | 2.3                | 6.7                                 | 22.9                               |
| 1975 to 1979                                    | 5.8                 | 9.7  | 33.0                               | 748                                       | 4.0                | 10.4                                | 35.6                               | 818                                       | 1.8                | 8.0                                 | 27.3                               |
| 1980 to 1984                                    | 4.0                 | 8.2  | 27.9                               | 611                                       | 2.7                | 8.4                                 | 28.5                               | 625                                       | 1.3                | 7.8                                 | 26.6                               |
| 1985 or After                                   | 1.7                 | 7.7  | 26.2                               | 587                                       | 1.0                | 8.2                                 | 28.0                               | 641                                       | .7                 | 6.9                                 | 23.7                               |
|   |                     |  |                                    |   |                    |                                     |                                    |   |                    |                                     | 515                                |
| Status of Unit                                  |                     |  |                                    |   |                    |                                     |                                    |   |                    |                                     |                                    |
| Owned   | 48.6                | 8.7  | 29.7                               | 686                                       | 30.3               | 9.7                                 | 33.1                               | 767                                       | 18.3               | 7.1                                 | 24.2                               |
| Condominium                                     | .8                  | 6.0  | 20.4                               | 528                                       | .6                 | 6.3                                 | 21.4                               | 579                                       | .2                 | 5.2                                 | 17.9                               |
| Not a Condominium                               | 47.8                | 8.8  | 29.9                               | 689                                       | 29.7               | 9.8                                 | 33.4                               | 770                                       | 18.1               | 7.1                                 | 24.2                               |
| Rented  | 24.0                | 5.0  | 17.2                               | 423                                       | 12.4               | 5.7                                 | 19.6                               | 477                                       | 11.6               | 4.3                                 | 14.7                               |
| Public Housing                                  | 1.9                 | 3.8  | 13.1                               | 300                                       | .7                 | 5.0                                 | 17.2                               | 361                                       | 1.2                | 3.1                                 | 10.5                               |
| Not Public Housing                              | 22.1                | 5.1  | 17.5                               | 433                                       | 11.7               | 5.8                                 | 19.7                               | 484                                       | 10.4               | 4.4                                 | 15.1                               |
| Rent Subsidy                                    | 1.1                 | 4.5  | 15.2                               | 205                                       | .6                 | 5.0                                 | 17.0                               | 449                                       | .4                 | 3.7                                 | 12.7                               |
| No Rent Subsidy                                 | 21.0                | 5.2  | 17.7                               | 434                                       | 11.0               | 5.8                                 | 19.9                               | 486                                       | 10.0               | 4.5                                 | 15.2                               |
|   |                     |  |                                    |   |                    |                                     |                                    |   |                    |                                     | 377                                |
| 1987 Family Income                              |                     |  |                                    |   |                    |                                     |                                    |   |                    |                                     | 3.91                               |
| Less than \$5,000                               | 5.0                 | 5.0  | 17.2                               | 408                                       | 2.1                | 6.4                                 | 21.9                               | 503                                       | 2.9                | 4.1                                 | 13.8                               |
| \$5,000 to \$8,998                              | 9.7                 | 5.6  | 19.2                               | 447                                       | 4.5                | 6.8                                 | 23.2                               | 524                                       | 5.2                | 4.6                                 | 15.7                               |
| \$10,000 to \$14,999                            | 10.6                | 6.3  | 21.7                               | 507                                       | 5.6                | 7.0                                 | 23.7                               | 552                                       | 5.0                | 5.7                                 | 19.3                               |
| \$15,000 to \$19,999                            | 7.2                 | 6.7  | 22.8                               | 524                                       | 4.0                | 7.7                                 | 26.2                               | 582                                       | 3.2                | 5.4                                 | 18.6                               |
| \$20,000 to \$24,999                            | 7.0                 | 7.4  | 25.3                               | 593                                       | 4.1                | 8.2                                 | 27.9                               | 656                                       | 2.9                | 6.4                                 | 21.7                               |
| \$25,000 to \$34,999                            | 12.7                | 8.0  | 27.2                               | 624                                       | 8.0                | 8.8                                 | 679                                | 747                                       | 4.7                | 6.7                                 | 22.8                               |
| \$35,000 or \$49,999                            | 10.2                | 9.2  | 31.4                               | 726                                       | 7.0                | 9.8                                 | 33.5                               | 777                                       | 3.3                | 7.9                                 | 27.0                               |
| \$50,000 or More                                | 10.2                | 10.0                                       | 34.3                               | 832                                       | 7.4                | 10.7                                | 36.7                               | 907                                       | 2.8                | 8.2                                 | 27.9                               |

See footnotes at end of table.

**Table 18. Electricity Consumption and Expenditures for Households Not Using Electricity as Main Heating Fuel, 1987 (Continued)**

| Household Characteristics                             | Electricity Used: Not As Main Heating Fuel |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  | RSE Row Factors |  |
|---|--|------------------------------------|-----------------------------------|--|--------------------------------|------------------------------------|-----------------------------------|--|--------------------------------|------------------------------------|-----------------------------------|--|-----------------|--|
|   | Number of Households (million)             | Avg Amount Consumed (thousand kWh) | Avg Amount Consumed (million Btu) | Avg Expenditures per Household (dollars) | Used For Air Conditioning      |                                    |                                   |  | Not Used for Air Conditioning  |                                    |                                   |  |                 |  |
|   |  |                                    |                                   |  | Number of Households (million) | Avg Amount Consumed (thousand kWh) | Avg Amount Consumed (million Btu) | Avg Expenditures per Household (dollars) | Number of Households (million) | Avg Amount Consumed (thousand kWh) | Avg Amount Consumed (million Btu) | Avg Expenditures per Household (dollars) |                 |  |
| RSE Column Factors:                                   | 1.220                                      | 0.720                              | 0.720                             | 0.704                                    | 1.785                          | 0.931                              | 0.931                             | 0.888                                    | 1.930                          | 0.955                              | 0.955                             | 0.930                                    |                 |  |
| <b>Below 100 Percent of Poverty Line</b>              | 9.8  | 5.9                                | 20.2                              | 473                                      | 3.9                            | 7.4                                | 25.4                              | 576                                      | 5.9                            | 4.9                                | 16.7                              | 405                                      | 5.18            |  |
| <b>Below 125 Percent of Poverty Line</b>              | 15.2                                       | 6.1                                | 20.6                              | 486                                      | 6.7                            | 7.3                                | 25.0                              | 573                                      | 8.5                            | 5.1                                | 17.2                              | 417                                      | 4.01            |  |
| <b>Assistance for Heating in Winter</b>               |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Yes   | 4.3  | 5.7                                | 19.4                              | 466                                      | 1.5                            | 6.5                                | 22.3                              | 535                                      | 2.8                            | 5.2                                | 17.9                              | 429                                      | 5.53            |  |
| No  | 68.3                                       | 7.6                                | 26.0                              | 607                                      | 41.2                           | 8.6                                | 29.4                              | 688                                      | 27.2                           | 6.1                                | 20.8                              | 485                                      | 1.83            |  |
| <b>Assistance for Weatherization of Residence</b>     |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Yes   | .9   | 5.9                                | 20.1                              | 467                                      | .3                             | 7.4                                | 25.3                              | 587                                      | .6                             | 5.0                                | 16.9                              | 395                                      | 10.60           |  |
| No  | 71.7                                       | 7.5                                | 25.7                              | 601                                      | 42.3                           | 8.6                                | 29.2                              | 683                                      | 29.4                           | 6.0                                | 20.6                              | 482                                      | 1.77            |  |
| <b>Household Owns or Has Regular Use of a Vehicle</b> |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Yes   | 63.0                                       | 8.0                                | 27.3                              | 632                                      | 38.9                           | 8.9                                | 30.5                              | 706                                      | 24.1                           | 6.6                                | 22.3                              | 513                                      | 1.83            |  |
| No  | 9.6  | 4.2                                | 14.2                              | 383                                      | 3.8                            | 4.8                                | 16.4                              | 443                                      | 5.8                            | 3.7                                | 12.7                              | 343                                      | 4.78            |  |
| <b>Race of Householder</b>                            |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| White   | 60.6                                       | 7.8                                | 26.6                              | 617                                      | 36.5                           | 8.7                                | 29.6                              | 694                                      | 24.1                           | 6.4                                | 22.0                              | 500                                      | 1.86            |  |
| Black   | 9.5  | 6.4                                | 21.7                              | 526                                      | 5.1                            | 8.2                                | 28.0                              | 636                                      | 4.4                            | 4.3                                | 14.5                              | 400                                      | 5.38            |  |
| Other   | 2.5  | 4.8                                | 16.4                              | 437                                      | 1.1                            | 5.7                                | 19.4                              | 497                                      | 1.4                            | 4.1                                | 14.1                              | 391                                      | 8.50            |  |
| <b>Householder of Hispanic Descent</b>                |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Yes   | 4.1  | 5.9                                | 20.3                              | 519                                      | 2.1                            | 7.4                                | 25.1                              | 635                                      | 2.1                            | 4.5                                | 15.5                              | 403                                      | 7.08            |  |
| No  | 68.5                                       | 7.6                                | 25.9                              | 604                                      | 40.6                           | 8.6                                | 29.4                              | 685                                      | 27.9                           | 6.1                                | 20.9                              | 486                                      | 1.78            |  |
| <b>Age of Householder</b>                             |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Under 25 Years  | 4.5  | 5.5                                | 18.8                              | 436                                      | 2.4                            | 6.4                                | 21.8                              | 500                                      | 2.1                            | 4.5                                | 15.4                              | 361                                      | 6.32            |  |
| 25 to 34 Years  | 16.8                                       | 7.1                                | 24.3                              | 572                                      | 9.7                            | 7.9                                | 26.9                              | 634                                      | 7.2                            | 6.1                                | 20.7                              | 488                                      | 3.30            |  |
| 35 to 44 Years  | 13.9                                       | 8.5                                | 29.0                              | 676                                      | 8.2                            | 9.6                                | 32.8                              | 763                                      | 5.7                            | 6.9                                | 23.5                              | 550                                      | 3.34            |  |
| 45 to 59 Years  | 15.4                                       | 9.1                                | 31.0                              | 715                                      | 9.4                            | 10.4                               | 35.4                              | 817                                      | 6.1                            | 7.1                                | 24.2                              | 556                                      | 3.05            |  |
| 60 Years and Over                                     | 22.0                                       | 6.5                                | 22.1                              | 523                                      | 13.0                           | 7.5                                | 25.5                              | 604                                      | 8.9                            | 5.0                                | 17.0                              | 405                                      | 3.22            |  |
| <b>Household Size</b>                                 |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| 1 Person  | 16.7                                       | 4.4                                | 14.9                              | 363                                      | 9.2                            | 5.0                                | 17.0                              | 411                                      | 7.5                            | 3.6                                | 12.3                              | 304                                      | 3.63            |  |
| 2 Persons   | 24.1                                       | 7.3                                | 25.0                              | 582                                      | 15.0                           | 8.3                                | 28.5                              | 662                                      | 9.1                            | 5.6                                | 19.2                              | 448                                      | 2.63            |  |
| 3 Persons   | 12.5                                       | 8.5                                | 29.1                              | 668                                      | 7.5                            | 9.7                                | 33.0                              | 765                                      | 5.0                            | 6.8                                | 23.3                              | 522                                      | 3.33            |  |
| 4 Persons   | 11.2                                       | 9.7                                | 32.9                              | 758                                      | 6.9                            | 10.7                               | 36.7                              | 842                                      | 4.3                            | 7.9                                | 27.0                              | 625                                      | 3.55            |  |
| 5 Persons   | 5.4  | 9.9                                | 33.8                              | 800                                      | 2.9                            | 11.6                               | 39.4                              | 933                                      | 2.5                            | 8.0                                | 27.3                              | 647                                      | 4.03            |  |
| 6 or More Persons                                     | 2.7  | 10.0                               | 34.0                              | 828                                      | 1.2                            | 11.9                               | 40.4                              | 991                                      | 1.5                            | 8.5                                | 29.0                              | 703                                      | 6.39            |  |
| <b>Secondary Heating</b>                              |  |                                    |                                   |  |                                |                                    |                                   |  |                                |                                    |                                   |  |                 |  |
| Yes   | 30.0                                       | 9.2                                | 31.5                              | 702                                      | 17.6                           | 10.4                               | 35.4                              | 796                                      | 12.3                           | 7.6                                | 26.0                              | 568                                      | 2.49            |  |
| Over 33 Percent of Home's Total Heat                  | 2.4  | 9.5                                | 32.3                              | 694                                      | 1.2                            | 10.1                               | 34.4                              | 744                                      | 1.2                            | 8.9                                | 30.2                              | 642                                      | 8.22            |  |
| No  | 42.6                                       | 6.3                                | 21.4                              | 526                                      | 25.1                           | 7.3                                | 24.8                              | 603                                      | 17.6                           | 4.9                                | 16.7                              | 418                                      | 2.38            |  |

See footnotes at end of table.

## NOT ELECTRICALLY HEATED

**Table 18. Electricity Consumption and Expenditures for Households Not Using Electricity as Main Heating Fuel, 1987 (Continued)**

| Household Characteristics     | Electricity Used: Not As Main Heating Fuel   |   |   |  |  |  |  |  |  |       |
|-------------------------------|--|---|---|--|--|--|--|--|--|-------|
|                               | Used For Air Conditioning                    |   |   |  |  | Not Used for Air Conditioning                    |  |  |  |       |
|                               | Avg. Amount<br>Consumed<br>(thousand<br>kWh) | Avg. Amount<br>Consumed<br>(million<br>Btu) | Avg. Num-<br>ber of<br>House-<br>hold<br>(mil-<br>lion) | Avg. Con-<br>sumed<br>(thou-<br>sand<br>kWh) | Avg. Expen-<br>ditures<br>per<br>House-<br>hold<br>(mil-<br>lion<br>Btu) | Avg. Amount<br>Consumed<br>(mil-<br>lion<br>Btu) | Avg. Expen-<br>ditures<br>per<br>House-<br>hold<br>(mil-<br>lion<br>Btu) | Avg. Con-<br>sumed<br>(thou-<br>sand<br>kWh) | Avg. Expen-<br>ditures<br>per<br>House-<br>hold<br>(mil-<br>lion<br>Btu) |       |
| RSE Column Factors            | 1.226  | 0.720                                       | 0.720   | 0.704  | 1.785  | 0.931  | 0.888  | 1.930  | 0.955  | 0.930 |
| <b>Fuel Combinations</b>      |  |   |   |  |  |  |  |  |  |       |
| Use Natural Gas for Main Heat | 56.0   | 7.1   | 24.3  | 57.2   | 31.6   | 8.3  | 28.2   | 65.8   | 18.4   | 5.2   |
| Use Natural Gas to Heat Water |  |   |   |  |  |  |  |  |  | 17.7  |
| and Have A/C                  | 28.6   | 7.8   | 26.7  | 63.8   | 28.1   | 7.9  | 26.8   | 64.1   | Q  | 5.6   |
| and Lack A/C                  | 16.3   | 4.9   | 16.6  | 41.1   | --   | --   | --   | --   | 16.3   | 4.9   |
| Use Electricity to Heat Water |  |   |   |  |  |  |  |  |  | 16.6  |
| and Have A/C                  | 3.4  | 11.5  | 39.1  | 79.7   | 3.4  | 11.5   | 39.1   | 79.7   | NC   | NC    |
| and Lack A/C                  | 1.6  | 8.6   | 29.4  | 57.0   | --   | --   | --   | --   | 1.6  | 8.6   |
| Other                         |  |   |   |  |  |  |  |  |  | Q     |
| and Have A/C                  | 1.2  | 7.4   | 25.1  | 65.2   | .2   | 9.1  | 31.0   | 84.8   | Q  | Q     |
| and Lack A/C                  | 10.9   | 7.3   | 24.8  | 63.3   | 5.6  | 8.0  | 27.4   | 71.9   | 5.3  | 22.1  |
| Use Fuel Oil for Main Heat    |  |   |   |  |  |  |  |  |  | 5.5   |
| Use Fuel Oil to Heat Water    |  |   |   |  |  |  |  |  |  | 5.07  |
| and Have A/C                  | 2.6  | 5.9   | 20.3  | 64.6   | 2.6  | 5.9  | 20.3   | 64.6   | NC   | NC    |
| and Lack A/C                  | 2.5  | 4.1   | 13.9  | 42.2   | --   | --   | --   | --   | 2.5  | 4.1   |
| Use Electricity to Heat Water |  |   |   |  |  |  |  |  |  | 13.9  |
| and Have A/C                  | 2.0  | 11.4  | 39.0  | 84.8   | 2.0  | 11.4   | 39.0   | 84.8   | NC   | NC    |
| Use Natural Gas to Heat Water |  |   |   |  |  |  |  |  |  | NC    |
| and Have A/C                  | .9   | 6.5   | 22.3  | 65.2   | .9   | 6.5  | 22.3   | 65.2   | NC   | NC    |
| Other                         |  |   |   |  |  |  |  |  |  | 10.35 |
| Use Wood for Main Heat        |  |   |   |  |  |  |  |  |  | 10.98 |
| Use LPG for Main Heat         |  |   |   |  |  |  |  |  |  | 5.15  |
| Use Kerosene for Main Heat    |  |   |   |  |  |  |  |  |  | 6.90  |
| Use Coal for Main Heat        |  |   |   |  |  |  |  |  |  | 6.26  |
| No Heating Fuel/Other Fuel    |  |   |   |  |  |  |  |  |  | 23.79 |
|                               |  |   |   |  |  |  |  |  |  | 15.22 |

NC No cases in sample.

-- Data not applicable.

Q Data withheld either because the RSE was greater than 50 percent or fewer than 10 households were sampled.

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

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Forms EA-457 A, B, C, E of the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).

**Table 19. Household Fuel Oil or Kerosene Consumption and Expenditures, 1987**

| Household Characteristics                     | Fuel Oil or Kerosene Used:     |   |   |                                      |                                    |                                |                                   |                                       |  | RSE Row Factors |  |
|---|--------------------------------|---|---|--------------------------------------|------------------------------------|--------------------------------|-----------------------------------|---------------------------------------|--|-----------------|--|
|   | Number of Households (million) | Total Amount Consumed (billion gallons) | Total Amount Consumed (quadrillion Btu) | Total Expenditures (billion dollars) | Average Price (dollars per gallon) | As Main Heating Fuel           |                                   |                                       |  |                 |  |
|   |                                |   |   |                                      |                                    | Number of Households (million) | Average Amount Consumed (gallons) | Average Amount Consumed (million Btu) | Average Expenditures per Household (dollars) |                 |  |
| RSE Column Factors:                           | 1.399                          | 1.636                                   | 1.637                                   | 1.584                                | .0235                              | 1.607                          | 0.744                             | 0.747                                 | 0.803  |                 |  |
| <b>Total U.S. Households .....</b>            | 17.4                           | 8.85                                    | 1.22                                    | 7.2                                  | 0.81                               | 12.2                           | 671                               | 92.9                                  | 542  | 3.69            |  |
| <b>Census Region and Division</b>             |                                |   |   |                                      |                                    |                                |                                   |                                       |  |                 |  |
| Northeast .....                               | 9.1                            | 6.31                                    | .87                                     | 5.1                                  | .80                                | 8.0                            | 761                               | 105.4                                 | 608  | 4.73            |  |
| New England .....                             | 2.6                            | 1.90                                    | .26                                     | 1.6                                  | .82                                | 2.4                            | 773                               | 107.1                                 | 634  | 4.96            |  |
| Middle Atlantic .....                         | 6.5                            | 4.41                                    | .61                                     | 3.5                                  | .79                                | 5.6                            | 756                               | 104.7                                 | 597  | 6.35            |  |
| Midwest .....                                 | 3.1                            | 1.15                                    | .16                                     | 1.0                                  | .82                                | 1.5                            | 585                               | 80.9                                  | 475  | 7.52            |  |
| East North Central .....                      | 2.5                            | .98                                     | .13                                     | .8                                   | .83                                | 1.2                            | 606                               | 83.7                                  | 496  | 8.43            |  |
| West North Central .....                      | .6                             | .18                                     | .02                                     | .1                                   | .79                                | .3                             | 506                               | 70.0                                  | 398  | 13.54           |  |
| South .....                                   | 4.6                            | 1.25                                    | .17                                     | 1.1                                  | .86                                | 2.3                            | 456                               | 62.8                                  | 391  | 7.37            |  |
| South Atlantic .....                          | 3.6                            | 1.06                                    | .15                                     | .9                                   | .86                                | 2.0                            | 463                               | 63.8                                  | 397  | 7.92            |  |
| East South Central .....                      | 1.0                            | .18                                     | .03                                     | .2                                   | .89                                | .3                             | 441                               | 60.3                                  | 373  | 20.32           |  |
| West South Central .....                      | Q                              | Q                                       | Q                                       | Q                                    | Q                                  | Q                              | Q                                 | Q                                     | Q  | a               |  |
| West .....                                    | .6                             | .13                                     | .02                                     | .1                                   | .85                                | Q                              | 369                               | 51.1                                  | 289  | 31.10           |  |
| <b>Metropolitan Status</b>                    |                                |   |   |                                      |                                    |                                |                                   |                                       |  |                 |  |
| Metropolitan .....                            | 12.6                           | 6.93                                    | .96                                     | 5.6                                  | .81                                | 9.4                            | 700                               | 96.9                                  | 563  | 3.87            |  |
| Central City .....                            | 5.0                            | 2.42                                    | .34                                     | 1.9                                  | .77                                | 3.7                            | 615                               | 85.2                                  | 469  | 6.75            |  |
| Outside Central City .....                    | 7.6                            | 4.51                                    | .62                                     | 3.7                                  | .83                                | 5.7                            | 754                               | 104.4                                 | 623  | 5.31            |  |
| Nonmetropolitan .....                         | 4.8                            | 1.92                                    | .26                                     | 1.6                                  | .83                                | 2.8                            | 576                               | 79.4                                  | 474  | 9.79            |  |
| <b>Climate Zone</b>                           |                                |   |   |                                      |                                    |                                |                                   |                                       |  |                 |  |
| Under 2,000 CDD and--                         |                                |   |   |                                      |                                    |                                |                                   |                                       |  |                 |  |
| Over 7,000 HDD .....                          | 2.8                            | 1.53                                    | .21                                     | 1.2                                  | .80                                | 2.0                            | 648                               | 89.7                                  | 518  | 13.39           |  |
| 5,500 to 7,000 HDD .....                      | 5.0                            | 3.16                                    | .44                                     | 2.6                                  | .83                                | 3.7                            | 801                               | 110.8                                 | 663  | 7.39            |  |
| 4,000 to 5,499 HDD .....                      | 7.1                            | 3.70                                    | .51                                     | 2.9                                  | .79                                | 5.3                            | 663                               | 91.9                                  | 521  | 6.52            |  |
| Under 4,000 HDD .....                         | 1.8                            | .40                                     | .05                                     | .4                                   | .89                                | .8                             | 402                               | 55.1                                  | 353  | 13.05           |  |
| 2,000 CDD or More and --                      |                                |   |   |                                      |                                    |                                |                                   |                                       |  |                 |  |
| Under 4,000 HDD .....                         | .7                             | Q                                       | Q                                       | Q                                    | 1.07                               | .3                             | Q                                 | Q                                     | Q  | 26.44           |  |
| <b>Fuel Oil or Kerosene Paid by Household</b> |                                |   |   |                                      |                                    |                                |                                   |                                       |  |                 |  |
| Yes .....                                     | 14.0                           | 6.92                                    | .96                                     | 5.8                                  | .84                                | 9.2                            | 693                               | 95.9                                  | 578  | 4.07            |  |
| Budget Plan .....                             | 1.4                            | 1.27                                    | .18                                     | 1.1                                  | .84                                | 1.4                            | 894                               | 123.8                                 | 755  | 9.01            |  |
| No Budget Plan .....                          | 12.6                           | 5.64                                    | .78                                     | 4.7                                  | .84                                | 7.8                            | 656                               | 90.7                                  | 546  | 4.13            |  |
| No .....                                      | 3.4                            | 1.94                                    | .27                                     | 1.4                                  | .72                                | 3.0                            | 603                               | 83.7                                  | 432  | 7.03            |  |
| <b>Housing Structure by Status of Unit</b>    |                                |   |   |                                      |                                    |                                |                                   |                                       |  |                 |  |
| Single-Family Detached .....                  | 11.1                           | 5.77                                    | .80                                     | 4.8                                  | .84                                | 7.2                            | 727                               | 100.7                                 | 603  | 4.39            |  |
| Owned .....                                   | 9.7                            | 5.26                                    | .73                                     | 4.4                                  | .83                                | 6.4                            | 753                               | 104.2                                 | 624  | 4.38            |  |
| Rented .....                                  | 1.4                            | .51                                     | .07                                     | .4                                   | .85                                | .7                             | 507                               | 70.0                                  | 424  | 11.79           |  |
| Single-Family Attached .....                  | .9                             | .52                                     | .07                                     | .5                                   | .88                                | .7                             | 762                               | 105.5                                 | 657  | 14.50           |  |
| Owned .....                                   | .7                             | .45                                     | .06                                     | .4                                   | .88                                | .6                             | 787                               | 108.9                                 | 682  | 17.75           |  |
| Rented .....                                  | .2                             | .07                                     | .01                                     | .1                                   | .91                                | Q                              | Q                                 | Q                                     | Q  | 22.90           |  |
| Building of 2 to 4 Units .....                | 1.7                            | .95                                     | .13                                     | .8                                   | .83                                | 1.5                            | 633                               | 87.7                                  | 527  | 6.95            |  |
| Owned .....                                   | .5                             | .35                                     | .05                                     | .3                                   | .84                                | .4                             | 806                               | 111.7                                 | 675  | 13.48           |  |
| Rented .....                                  | 1.2                            | .61                                     | .08                                     | .5                                   | .83                                | 1.1                            | 564                               | 78.2                                  | 468  | 9.86            |  |
| Building of 5 or More Units .....             | 2.5                            | 1.24                                    | .17                                     | .8                                   | .65                                | 2.0                            | 580                               | 80.4                                  | 378  | 8.88            |  |
| Mobile Home .....                             | 1.3                            | .37                                     | .05                                     | .3                                   | .88                                | .8                             | 408                               | 55.6                                  | 354  | 12.46           |  |
| <b>Number of Rooms</b>                        |                                |   |   |                                      |                                    |                                |                                   |                                       |  |                 |  |
| 1 .....                                       | Q                              | Q                                       | Q                                       | Q                                    | .73                                | Q                              | Q                                 | Q                                     | Q  | 92.16           |  |
| 2 .....                                       | .6                             | .22                                     | .03                                     | .1                                   | .65                                | .4                             | 491                               | 68.1                                  | 317  | 18.95           |  |
| 3 .....                                       | 1.6                            | .73                                     | .10                                     | .5                                   | .71                                | 1.3                            | 539                               | 74.6                                  | 380  | 8.58            |  |
| 4 .....                                       | 2.7                            | 1.18                                    | .16                                     | .9                                   | .80                                | 2.1                            | 510                               | 70.3                                  | 405  | 6.72            |  |
| 5 .....                                       | 4.4                            | 1.79                                    | .25                                     | 1.5                                  | .83                                | 2.8                            | 585                               | 80.9                                  | 483  | 5.34            |  |
| 6 .....                                       | 3.3                            | 1.66                                    | .23                                     | 1.4                                  | .83                                | 2.2                            | 702                               | 97.2                                  | 578  | 6.65            |  |
| 7 .....                                       | 2.4                            | 1.44                                    | .20                                     | 1.2                                  | .83                                | 1.6                            | 801                               | 110.9                                 | 655  | 7.27            |  |
| 8 or More .....                               | 2.4                            | 1.79                                    | .25                                     | 1.5                                  | .85                                | 1.7                            | 1,001                             | 138.6                                 | 842  | 7.34            |  |

See footnotes at end of table.

**Table 19. Household Fuel Oil or Kerosene Consumption and Expenditures, 1987 (Continued)**

| Household Characteristics                              | Fuel Oil or Kerosene Used:     |   |   |                                      |                                    |                                |                                   |                                       |  | RSE Row Factors |  |
|--|--------------------------------|---|---|--------------------------------------|------------------------------------|--------------------------------|-----------------------------------|---------------------------------------|--|-----------------|--|
|  | Number of Households (million) | Total Amount Consumed (billion gallons) | Total Amount Consumed (quadrillion Btu) | Total Expenditures (billion dollars) | Average Price (dollars per gallon) | As Main Heating Fuel           |                                   |                                       |  |                 |  |
|  |                                |   |   |                                      |                                    | Number of Households (million) | Average Amount Consumed (gallons) | Average Amount Consumed (million Btu) | Average Expenditures per Household (dollars) |                 |  |
| RSE Column Factors:                                    | 1.399                          | 1.636                                   | 1.637                                   | 1.584                                | 0.235                              | 1.607                          | 0.744                             | 0.747                                 | 0.803  |                 |  |
| <b>Number of Rooms That Can Be Air Conditioned</b>     |                                |   |   |                                      |                                    |                                |                                   |                                       |  |                 |  |
| All .....  | 4.6                            | 1.75                                    | 0.24                                    | 1.4                                  | 0.82                               | 2.7                            | 585                               | 80.9                                  | 473  | 7.19            |  |
| Some .....   | 5.0                            | 2.97                                    | .41                                     | 2.5                                  | .82                                | 3.7                            | 767                               | 106.2                                 | 628  | 5.20            |  |
| None .....   | 7.8                            | 4.13                                    | .57                                     | 3.3                                  | .81                                | 5.8                            | 650                               | 90.0                                  | 520  | 5.54            |  |
| <b>Measured Heated Area of Residence (square feet)</b> |                                |   |   |                                      |                                    |                                |                                   |                                       |  |                 |  |
| Fewer than 600 .....                                   | 1.7                            | .77                                     | .11                                     | .6                                   | .73                                | 1.3                            | 562                               | 77.8                                  | 407  | 8.72            |  |
| 600 to 999 .....                                       | 4.1                            | 1.57                                    | .22                                     | 1.2                                  | .78                                | 3.0                            | 497                               | 68.6                                  | 386  | 7.65            |  |
| 1,000 to 1,599 .....                                   | 4.4                            | 1.90                                    | .26                                     | 1.6                                  | .83                                | 2.8                            | 616                               | 85.2                                  | 510  | 5.27            |  |
| 1,600 to 1,999 .....                                   | 2.3                            | 1.13                                    | .16                                     | 1.0                                  | .84                                | 1.5                            | 676                               | 93.6                                  | 563  | 6.85            |  |
| 2,000 to 2,399 .....                                   | 1.7                            | 1.01                                    | .14                                     | .9                                   | .85                                | 1.2                            | 778                               | 107.8                                 | 651  | 7.82            |  |
| 2,400 to 2,999 .....                                   | 2.0                            | 1.22                                    | .17                                     | 1.0                                  | .82                                | 1.4                            | 812                               | 112.5                                 | 662  | 6.72            |  |
| 3,000 or More .....                                    | 1.4                            | 1.26                                    | .17                                     | 1.0                                  | .82                                | 1.1                            | 1,124                             | 155.7                                 | 920  | 7.43            |  |
| <b>Year of Construction</b>                            |                                |   |   |                                      |                                    |                                |                                   |                                       |  |                 |  |
| 1939 or Before .....                                   | 6.1                            | 3.69                                    | .51                                     | 3.0                                  | .82                                | 4.7                            | 735                               | 101.8                                 | 598  | 6.22            |  |
| 1940 to 1949 .....                                     | 2.0                            | .92                                     | .13                                     | .7                                   | .79                                | 1.4                            | 631                               | 87.4                                  | 496  | 7.70            |  |
| 1950 to 1959 .....                                     | 2.8                            | 1.62                                    | .22                                     | 1.3                                  | .83                                | 2.2                            | 702                               | 97.2                                  | 576  | 6.98            |  |
| 1960 to 1969 .....                                     | 2.7                            | 1.29                                    | .18                                     | 1.0                                  | .78                                | 1.9                            | 618                               | 85.5                                  | 480  | 8.05            |  |
| 1970 to 1974 .....                                     | 1.4                            | .52                                     | .07                                     | .4                                   | .83                                | .8                             | 530                               | 72.9                                  | 433  | 12.83           |  |
| 1975 to 1979 .....                                     | 1.7                            | .60                                     | .08                                     | .5                                   | .85                                | .8                             | 643                               | 89.0                                  | 542  | 10.33           |  |
| 1980 to 1984 .....                                     | .6                             | .16                                     | .02                                     | .1                                   | .85                                | .3                             | 409                               | 56.7                                  | 324  | 17.89           |  |
| 1985 or After .....                                    | .2                             | Q                                       | Q                                       | Q                                    | .83                                | Q                              | Q                                 | Q                                     | Q  | 25.78           |  |
| <b>Status of Unit</b>                                  |                                |   |   |                                      |                                    |                                |                                   |                                       |  |                 |  |
| Owned .....  | 12.2                           | 6.40                                    | .89                                     | 5.4                                  | .84                                | 8.2                            | 724                               | 100.1                                 | 602  | 4.12            |  |
| Condominium .....                                      | Q                              | Q                                       | Q                                       | Q                                    | Q                                  | Q                              | Q                                 | Q                                     | Q  | a               |  |
| Not a Condominium .....                                | 12.1                           | 6.38                                    | .88                                     | 5.3                                  | .84                                | 8.2                            | 723                               | 100.1                                 | 602  | 4.13            |  |
| Rented .....   | 5.2                            | 2.45                                    | .34                                     | 1.8                                  | .75                                | 4.0                            | 562                               | 77.8                                  | 419  | 5.38            |  |
| Public Housing .....                                   | .4                             | .22                                     | .03                                     | .1                                   | .66                                | Q                              | 596                               | 82.6                                  | 398  | 30.72           |  |
| Not Public Housing .....                               | 4.8                            | 2.23                                    | .31                                     | 1.7                                  | .76                                | 3.6                            | 559                               | 77.4                                  | 420  | 6.46            |  |
| Rent Subsidy .....                                     | .3                             | .12                                     | .02                                     | .1                                   | .68                                | .3                             | 467                               | 64.8                                  | 318  | 15.35           |  |
| No Rent Subsidy .....                                  | 4.5                            | 2.11                                    | .28                                     | 1.6                                  | .77                                | 3.4                            | 566                               | 78.3                                  | 428  | 7.33            |  |
| <b>1987 Family Income</b>                              |                                |   |   |                                      |                                    |                                |                                   |                                       |  |                 |  |
| Less than \$5,000 .....                                | 1.0                            | .40                                     | .05                                     | .3                                   | .79                                | .7                             | 528                               | 72.7                                  | 403  | 15.43           |  |
| \$5,000 to \$9,999 .....                               | 2.1                            | 1.13                                    | .16                                     | .9                                   | .80                                | 1.7                            | 607                               | 83.9                                  | 481  | 6.07            |  |
| \$10,000 to \$14,999 .....                             | 2.6                            | 1.15                                    | .16                                     | .9                                   | .81                                | 1.8                            | 605                               | 83.5                                  | 488  | 7.86            |  |
| \$15,000 to \$19,999 .....                             | 1.7                            | .83                                     | .11                                     | .7                                   | .83                                | 1.2                            | 653                               | 90.4                                  | 537  | 8.83            |  |
| \$20,000 to \$24,999 .....                             | 1.8                            | .84                                     | .12                                     | .7                                   | .83                                | 1.3                            | 566                               | 78.2                                  | 460  | 7.19            |  |
| \$25,000 to \$34,999 .....                             | 3.5                            | 1.56                                    | .22                                     | 1.3                                  | .81                                | 2.3                            | 621                               | 86.0                                  | 496  | 7.17            |  |
| \$35,000 to \$49,999 .....                             | 2.4                            | 1.38                                    | .19                                     | 1.1                                  | .82                                | 1.6                            | 780                               | 108.1                                 | 633  | 6.26            |  |
| \$50,000 or More .....                                 | 2.2                            | 1.57                                    | .22                                     | 1.3                                  | .83                                | 1.6                            | 937                               | 129.9                                 | 773  | 8.85            |  |

See footnotes at end of table.

**Table 19. Household Fuel Oil or Kerosene Consumption and Expenditures, 1987 (Continued)**

| Household Characteristics                             | Fuel Oil or Kerosene Used:     |   |   |                                      |                                    |                                |                                   |                                       | RSE Row Factors                              |       |
|---|--------------------------------|---|---|--------------------------------------|------------------------------------|--------------------------------|-----------------------------------|---------------------------------------|--|-------|
|   | Number of Households (million) | Total Amount Consumed (billion gallons) | Total Amount Consumed (quadrillion Btu) | Total Expenditures (billion dollars) | Average Price (dollars per gallon) | As Main Heating Fuel           |                                   |                                       |  |       |
|   |                                |   |   |                                      |                                    | Number of Households (million) | Average Amount Consumed (gallons) | Average Amount Consumed (million Btu) | Average Expenditures per Household (dollars) |       |
| RSE Column Factors:                                   | 1.399                          | 1.636                                   | 1.637                                   | 1.584                                | 0.235                              | 1.607                          | 0.744                             | 0.747                                 | 0.803  |       |
| <b>Below 100 Percent of Poverty Line</b>              | 2.0                            | 0.79                                    | 0.11                                    | 0.6                                  | 0.79                               | 1.3                            | 515                               | 71.0                                  | 395  | 8.44  |
| <b>Below 125 Percent of Poverty Line</b>              | 3.2                            | 1.40                                    | .19                                     | 1.1                                  | .80                                | 2.3                            | 552                               | 76.2                                  | 432  | 6.50  |
| <b>Assistance for Heating in Winter</b>               |                                |   |   |                                      |                                    |                                |                                   |                                       |  |       |
| Yes .....   | .9                             | .39                                     | .05                                     | .3                                   | .82                                | .7                             | 533                               | 73.6                                  | 430  | 8.24  |
| No .....  | 16.5                           | 8.46                                    | 1.17                                    | 6.9                                  | .81                                | 11.5                           | 679                               | 94.0                                  | 549  | 3.76  |
| <b>Assistance for Weatherization of Residence</b>     |                                |   |   |                                      |                                    |                                |                                   |                                       |  |       |
| Yes .....   | .2                             | .11                                     | .01                                     | .1                                   | .85                                | .1                             | 633                               | 87.7                                  | 512  | 17.88 |
| No .....  | 17.2                           | 8.74                                    | 1.21                                    | 7.1                                  | .81                                | 12.0                           | 671                               | 92.9                                  | 543  | 3.70  |
| <b>Household Owns or Has Regular Use of a Vehicle</b> |                                |   |   |                                      |                                    |                                |                                   |                                       |  |       |
| Yes .....   | 14.5                           | 7.29                                    | 1.01                                    | 6.0                                  | .83                                | 9.7                            | 688                               | 95.1                                  | 567  | 3.81  |
| No .....  | 2.9                            | 1.56                                    | .22                                     | 1.2                                  | .74                                | 2.5                            | 606                               | 84.0                                  | 447  | 6.81  |
| <b>Race of Householder</b>                            |                                |   |   |                                      |                                    |                                |                                   |                                       |  |       |
| White .....   | 14.5                           | 7.50                                    | 1.04                                    | 6.1                                  | .82                                | 10.4                           | 665                               | 92.1                                  | 541  | 4.29  |
| Black .....   | 2.5                            | 1.14                                    | .16                                     | .9                                   | .79                                | 1.4                            | 735                               | 101.7                                 | 581  | 9.26  |
| Other .....   | .4                             | .22                                     | .03                                     | .2                                   | .74                                | .4                             | 582                               | 80.8                                  | 415  | 9.29  |
| <b>Householder of Hispanic Descent</b>                |                                |   |   |                                      |                                    |                                |                                   |                                       |  |       |
| Yes .....   | .9                             | .46                                     | .06                                     | .3                                   | .74                                | .7                             | 662                               | 91.8                                  | 488  | 8.25  |
| No .....  | 16.6                           | 8.39                                    | 1.16                                    | 6.9                                  | .82                                | 11.5                           | 671                               | 92.9                                  | 545  | 3.78  |
| <b>Age of Householder</b>                             |                                |   |   |                                      |                                    |                                |                                   |                                       |  |       |
| Under 25 Years .....                                  | .8                             | .35                                     | .05                                     | .3                                   | .83                                | .5                             | 533                               | 73.5                                  | 434  | 12.29 |
| 25 to 34 Years .....                                  | 3.8                            | 1.63                                    | .22                                     | 1.3                                  | .80                                | 2.5                            | 596                               | 82.5                                  | 472  | 6.89  |
| 35 to 44 Years .....                                  | 3.8                            | 1.80                                    | .25                                     | 1.5                                  | .82                                | 2.5                            | 677                               | 93.8                                  | 550  | 5.99  |
| 45 to 59 Years .....                                  | 3.7                            | 1.94                                    | .27                                     | 1.6                                  | .83                                | 2.3                            | 751                               | 104.0                                 | 619  | 6.16  |
| 60 Years and Over .....                               | 5.3                            | 3.12                                    | .43                                     | 2.5                                  | .80                                | 4.4                            | 686                               | 94.9                                  | 551  | 5.78  |
| <b>Household Size</b>                                 |                                |   |   |                                      |                                    |                                |                                   |                                       |  |       |
| 1 Person .....  | 3.9                            | 1.78                                    | .25                                     | 1.4                                  | .79                                | 2.9                            | 582                               | 80.5                                  | 458  | 6.04  |
| 2 Persons .....                                       | 5.7                            | 3.06                                    | .42                                     | 2.5                                  | .81                                | 4.1                            | 683                               | 94.5                                  | 551  | 5.84  |
| 3 Persons .....                                       | 3.2                            | 1.61                                    | .22                                     | 1.3                                  | .84                                | 2.2                            | 682                               | 94.3                                  | 567  | 5.68  |
| 4 Persons .....                                       | 2.9                            | 1.42                                    | .20                                     | 1.2                                  | .81                                | 1.9                            | 716                               | 99.0                                  | 574  | 6.02  |
| 5 Persons .....                                       | 1.2                            | .60                                     | .08                                     | .5                                   | .83                                | .8                             | 720                               | 99.8                                  | 597  | 8.47  |
| 6 or More Persons .....                               | .6                             | .38                                     | .05                                     | .3                                   | .83                                | .4                             | 822                               | 113.9                                 | 668  | 17.21 |
| <b>Secondary Heating</b>                              |                                |   |   |                                      |                                    |                                |                                   |                                       |  |       |
| Yes .....   | 10.0                           | 3.93                                    | .54                                     | 3.3                                  | .83                                | 5.0                            | 674                               | 93.3                                  | 554  | 4.96  |
| Over 33 Percent of Home's Total Heat .....            | 1.3                            | .50                                     | .07                                     | .4                                   | .85                                | .6                             | 608                               | 84.0                                  | 498  | 12.46 |
| No .....  | 7.4                            | 4.92                                    | .68                                     | 3.9                                  | .80                                | 7.2                            | 669                               | 92.6                                  | 534  | 4.93  |

See footnotes at end of table.

**Table 19. Household Fuel Oil or Kerosene Consumption and Expenditures, 1987 (Continued)**

| Household Characteristics                        | Fuel Oil or Kerosene Used:     |   |   |                                      |                                    |                                |                                   |                                       | RSE Row Factors                              |                 |
|--|--------------------------------|---|---|--------------------------------------|------------------------------------|--------------------------------|-----------------------------------|---------------------------------------|--|-----------------|
|  | Number of Households (million) | Total Amount Consumed (billion gallons) | Total Amount Consumed (quadrillion Btu) | Total Expenditures (billion dollars) | Average Price (dollars per gallon) | As Main Heating Fuel           |                                   |                                       |  |                 |
|  |                                |   |   |                                      |                                    | Number of Households (million) | Average Amount Consumed (gallons) | Average Amount Consumed (million Btu) | Average Expenditures per Household (dollars) |                 |
| RSE Column Factors:                              | 1.399                          | 1.636                                   | 1.637                                   | 1.584                                | 0.235                              | 1.607                          | 0.744                             | 0.747                                 | 0.803  | RSE Row Factors |
| <b>Fuel Combinations</b>                         |                                |   |   |                                      |                                    |                                |                                   |                                       |  |                 |
| Use Fuel Oil for Main Heat .....                 | 10.9                           | 7.77                                    | 1.08                                    | 6.2                                  | 0.80                               | 10.9                           | 715                               | 99.1                                  | 573  | 3.79            |
| Use Fuel Oil to Heat Water and Have A/C .....    | 2.1                            | 1.17                                    | .16                                     | .9                                   | .81                                | 2.1                            | 556                               | 76.9                                  | 447  | 9.94            |
| and Lack A/C .....                               | 2.6                            | 2.23                                    | .31                                     | 1.8                                  | .79                                | 2.6                            | 851                               | 118.0                                 | 676  | 9.06            |
| Use Electricity to Heat Water and Have A/C ..... | 2.0                            | 1.25                                    | .17                                     | 1.0                                  | .82                                | 2.0                            | 629                               | 87.1                                  | 513  | 8.52            |
| Use Natural Gas to Heat Water and Have A/C ..... | .9                             | .63                                     | .09                                     | .5                                   | .86                                | .9                             | 699                               | 96.8                                  | 597  | 9.79            |
| Other .....                                      | 3.3                            | 2.49                                    | .35                                     | 2.0                                  | .79                                | 3.3                            | 765                               | 106.0                                 | 602  | 5.74            |
| Use Kerosene for Main Heat .....                 | 1.3                            | .41                                     | .06                                     | .4                                   | .93                                | 1.3                            | 309                               | 41.7                                  | 286  | 12.48           |
| Other Fuel .....                                 | 5.2                            | .67                                     | .09                                     | .6                                   | .89                                | --                             | --                                | --                                    | --   | 9.87            |
| <b>Main Heating Equipment Using Fuel Oil</b>     |                                |   |   |                                      |                                    |                                |                                   |                                       |  |                 |
| Steam or Hot Water system .....                  | 6.3                            | 5.15                                    | .71                                     | 4.1                                  | .79                                | 6.3                            | 812                               | 112.6                                 | 643  | 4.86            |
| Central Warm Air Furnace .....                   | 4.0                            | 2.32                                    | .32                                     | 1.9                                  | .82                                | 4.0                            | 574                               | 79.5                                  | 471  | 6.54            |
| Other/None .....                                 | 7.0                            | 1.37                                    | .19                                     | 1.2                                  | .89                                | 1.8                            | 391                               | 53.4                                  | 345  | 8.43            |

-- Data not applicable.

\* No applicable RSE row factor.

a Data withheld either because the RSE was greater than 50 percent or fewer than 10 households were sampled.

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

• Because of rounding, data may not sum to totals. • See "Glossary" for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Forms EIA-457 A, B, C, G of the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).

**Table 20. Household Liquefied Petroleum Gas Consumption and Expenditures, 1987**

| Household Characteristics                          | Liquefied Petroleum Gas (LPG) Used: |   |                                |                                |                               |                                   |  |                                |                               |                                   |  |                 |
|--|-------------------------------------|---|--------------------------------|--------------------------------|-------------------------------|-----------------------------------|--|--------------------------------|-------------------------------|-----------------------------------|--|-----------------|
|  | Number of Households (million)      | Total Amount Consumed (billion gallons) | Avg Price (dollars per gallon) | As Main Heating Fuel           |                               |                                   |  | Not as Main Heating Fuel       |                               |                                   |  | RSE Row Factors |
|  |                                     |   |                                | Number of Households (million) | Avg Amount Consumed (gallons) | Avg Amount Consumed (million Btu) | Avg Expenditures per Household (dollars) | Number of Households (million) | Avg Amount Consumed (gallons) | Avg Amount Consumed (million Btu) | Avg Expenditures per Household (dollars) |                 |
| RSE Column Factors:                                | 1.177                               | 1.509                                   | 0.418                          | 1.491                          | 0.706                         | 0.706                             | 0.638                                    | 1.404                          | 1.328                         | 1.328                             | 1.145                                    |                 |
| <b>Total U.S. Households .....</b>                 | 7.7                                 | 3.45                                    | 0.81                           | 4.1                            | 669                           | 61.1                              | 500                                      | 3.5                            | 193                           | 17.6                              | 209                                      | 7.90            |
| <b>Census Region and Division</b>                  |                                     |   |                                |                                |                               |                                   |  |                                |                               |                                   |  |                 |
| Northeast .....                                    | 1.1                                 | .20                                     | 1.21                           | Q                              | Q                             | Q                                 | Q  | 1.0                            | 131                           | 12.0                              | 171                                      | 13.61           |
| Midwest .....                                      | 2.3                                 | 1.44                                    | .69                            | 1.3                            | 909                           | 83.1                              | 602                                      | .9                             | 240                           | 22.0                              | 205                                      | 11.18           |
| East North Central .....                           | 1.5                                 | .92                                     | .75                            | .9                             | 906                           | 82.8                              | 650                                      | .7                             | 216                           | 19.7                              | 196                                      | 16.81           |
| West North Central .....                           | .8                                  | .52                                     | .60                            | .5                             | 915                           | 83.6                              | 515                                      | .3                             | 294                           | 26.8                              | 223                                      | 11.21           |
| South .....  | 3.3                                 | 1.31                                    | .87                            | 2.1                            | 494                           | 45.1                              | 402                                      | 1.2                            | 215                           | 19.6                              | 238                                      | 12.72           |
| South Atlantic .....                               | 1.9                                 | .63                                     | 1.02                           | 1.1                            | 422                           | 38.6                              | 397                                      | .8                             | 220                           | 20.1                              | 267                                      | 17.62           |
| East South Central .....                           | .8                                  | .35                                     | .83                            | .5                             | 570                           | 52.1                              | 461                                      | .2                             | 173                           | 15.8                              | 179                                      | 15.00           |
| West South Central .....                           | .7                                  | Q                                       | .64                            | Q                              | 583                           | 51.4                              | 349                                      | Q                              | Q                             | Q                                 | Q  | 42.00           |
| West .....   | 1.0                                 | .51                                     | .85                            | .6                             | 773                           | 70.6                              | 601                                      | .4                             | 162                           | 14.8                              | 222                                      | 18.68           |
| Mountain .....                                     | Q                                   | Q                                       | .59                            | Q                              | 1,033                         | 94.4                              | 584                                      | Q                              | Q                             | Q                                 | Q  | 37.82           |
| Pacific .....                                      | .7                                  | .30                                     | 1.04                           | .4                             | 646                           | 59.0                              | 610                                      | .3                             | 144                           | 13.1                              | 221                                      | 20.47           |
| <b>Metropolitan Status</b>                         |                                     |   |                                |                                |                               |                                   |  |                                |                               |                                   |  |                 |
| Metropolitan .....                                 | 3.5                                 | 1.42                                    | .89                            | 1.8                            | 585                           | 53.4                              | 476                                      | 1.7                            | 208                           | 19.0                              | 233                                      | 11.75           |
| Central City .....                                 | .6                                  | .18                                     | 1.06                           | .3                             | 400                           | 36.6                              | 401                                      | .2                             | 220                           | 20.1                              | 263                                      | 24.44           |
| Outside Central City .....                         | 2.9                                 | 1.24                                    | .86                            | 1.5                            | 625                           | 57.1                              | 492                                      | 1.4                            | 206                           | 18.8                              | 228                                      | 18.55           |
| Nonmetropolitan .....                              | 4.2                                 | 2.03                                    | .76                            | 2.3                            | 736                           | 67.2                              | 519                                      | 1.9                            | 179                           | 16.3                              | 187                                      | 10.79           |
| <b>Climate Zone</b>                                |                                     |   |                                |                                |                               |                                   |  |                                |                               |                                   |  |                 |
| Under 2,000 CDD and--                              |                                     |   |                                |                                |                               |                                   |  |                                |                               |                                   |  |                 |
| Over 7,000 HDD .....                               | 1.7                                 | .90                                     | .73                            | .8                             | 920                           | 84.0                              | 617                                      | .9                             | 182                           | 16.6                              | 185                                      | 18.59           |
| 5,500 to 7,000 HDD .....                           | 1.4                                 | .59                                     | .82                            | .5                             | 887                           | 81.0                              | 643                                      | .9                             | 154                           | 14.1                              | 178                                      | 13.40           |
| 4,000 to 5,499 HDD .....                           | 1.4                                 | .70                                     | .74                            | .8                             | 759                           | 69.3                              | 537                                      | .6                             | 185                           | 16.9                              | 167                                      | 13.36           |
| Under 4,000 HDD .....                              | 1.6                                 | .81                                     | .87                            | 1.0                            | 635                           | 58.0                              | 512                                      | .6                             | 303                           | 27.6                              | 328                                      | 17.10           |
| 2,000 CDD or More and --                           |                                     |   |                                |                                |                               |                                   |  |                                |                               |                                   |  |                 |
| Under 4,000 HDD .....                              | 1.6                                 | .45                                     | .97                            | 1.1                            | 346                           | 31.6                              | 308                                      | .5                             | 150                           | 13.7                              | 205                                      | 18.24           |
| <b>All LPG Paid by Household</b>                   |                                     |   |                                |                                |                               |                                   |  |                                |                               |                                   |  |                 |
| Yes .....  | 7.3                                 | 3.34                                    | .81                            | 4.0                            | 676                           | 61.8                              | 504                                      | 3.3                            | 196                           | 17.9                              | 213                                      | 7.97            |
| Budget Plan .....                                  | 4.0                                 | 2.69                                    | .75                            | 4.0                            | 676                           | 61.8                              | 504                                      | NC                             | NC                            | NC                                | NC                                       | 8.12            |
| No Budget Plan .....                               | 3.3                                 | .65                                     | 1.09                           | NC                             | NC                            | NC                                | NC                                       | 3.3                            | 196                           | 17.9                              | 213                                      | 9.25            |
| No .....   | .4                                  | .12                                     | .87                            | Q                              | Q                             | Q                                 | 398                                      | .2                             | 148                           | 13.5                              | 155                                      | 30.10           |
| <b>Housing Structure by Status of Unit</b>         |                                     |   |                                |                                |                               |                                   |  |                                |                               |                                   |  |                 |
| Single-Family Detached .....                       | 5.7                                 | 2.76                                    | .79                            | 2.9                            | 751                           | 68.6                              | 545                                      | 2.8                            | 203                           | 18.6                              | 212                                      | 9.12            |
| Owned .....  | 4.7                                 | 2.35                                    | .79                            | 2.4                            | 773                           | 70.6                              | 565                                      | 2.3                            | 213                           | 19.5                              | 218                                      | 9.39            |
| Rented .....                                       | 1.0                                 | .41                                     | .79                            | .5                             | 650                           | 59.4                              | 453                                      | .5                             | 153                           | 14.0                              | 182                                      | 17.04           |
| Building of 2 or More Units .....                  | Q                                   | Q                                       | Q                              | NC                             | NC                            | NC                                | NC                                       | Q                              | Q                             | Q                                 | Q  | a               |
| Mobile Home .....                                  | 1.9                                 | .68                                     | .90                            | 1.2                            | 473                           | 43.2                              | 392                                      | .7                             | 148                           | 13.5                              | 197                                      | 15.23           |
| <b>Number of Rooms</b>                             |                                     |   |                                |                                |                               |                                   |  |                                |                               |                                   |  |                 |
| 1 to 3 .....                                       | .9                                  | .28                                     | .89                            | .4                             | 541                           | 49.4                              | 433                                      | .5                             | 134                           | 12.2                              | 159                                      | 19.06           |
| 4 .....  | 2.2                                 | .90                                     | .89                            | 1.4                            | 527                           | 48.1                              | 438                                      | .9                             | 194                           | 17.7                              | 227                                      | 12.38           |
| 5 .....  | 2.0                                 | .91                                     | .77                            | 1.1                            | 692                           | 63.2                              | 485                                      | .9                             | 163                           | 14.9                              | 192                                      | 13.75           |
| 6 .....  | 1.1                                 | .51                                     | .82                            | .5                             | 812                           | 74.2                              | 621                                      | .6                             | 225                           | 20.6                              | 220                                      | 13.80           |
| 7 .....  | .8                                  | .40                                     | .79                            | .4                             | 770                           | 70.4                              | 563                                      | .4                             | 238                           | 21.7                              | 224                                      | 16.39           |
| 8 or More .....                                    | .7                                  | .45                                     | .70                            | .4                             | 966                           | 88.3                              | 623                                      | .3                             | 236                           | 21.5                              | 244                                      | 19.46           |
| <b>Number of Rooms That Can Be Air Conditioned</b> |                                     |   |                                |                                |                               |                                   |  |                                |                               |                                   |  |                 |
| All .....  | 2.8                                 | 1.42                                    | .80                            | 1.6                            | 699                           | 63.8                              | 525                                      | 1.2                            | 238                           | 21.7                              | 238                                      | 9.87            |
| Some .....   | 1.5                                 | .65                                     | .72                            | .8                             | 646                           | 59.0                              | 429                                      | .7                             | 156                           | 14.2                              | 161                                      | 13.37           |
| None .....   | 3.3                                 | 1.38                                    | .87                            | 1.7                            | 651                           | 59.5                              | 511                                      | 1.7                            | 176                           | 16.1                              | 208                                      | 12.35           |

See footnotes at end of table.

**Table 20. Household Liquefied Petroleum Gas Consumption and Expenditures, 1987 (Continued)**

| Household Characteristics                              | Liquefied Petroleum Gas (LPG) Used: |   |                                |                                |                               |                                   |  |                                |                               |                                   |  | RSE Row Factors |  |
|--|-------------------------------------|---|--------------------------------|--------------------------------|-------------------------------|-----------------------------------|--|--------------------------------|-------------------------------|-----------------------------------|--|-----------------|--|
|  | Number of Households (million)      | Total Amount Consumed (billion gallons) | Avg Price (dollars per gallon) | As Main Heating Fuel           |                               |                                   |  | Not as Main Heating Fuel       |                               |                                   |  |                 |  |
|  |                                     |   |                                | Number of Households (million) | Avg Amount Consumed (gallons) | Avg Amount Consumed (million Btu) | Avg Expenditures per Household (dollars) | Number of Households (million) | Avg Amount Consumed (gallons) | Avg Amount Consumed (million Btu) | Avg Expenditures per Household (dollars) |                 |  |
| RSE Column Factors:                                    | 1.177                               | 1.509                                   | 0.418                          | 1.491                          | 0.706                         | 0.706                             | 0.638                                    | 1.404                          | 1.328                         | 1.328                             | 1.145                                    |                 |  |
| <b>Measured Heated Area of Residence (square feet)</b> |                                     |   |                                |                                |                               |                                   |  |                                |                               |                                   |  |                 |  |
| Fewer than 600 .....                                   | 0.9                                 | 0.29                                    | 0.95                           | 0.4                            | 540                           | 49.3                              | 444                                      | 0.6                            | 145                           | 13.2                              | 184                                      | 15.70           |  |
| 600 to 999 .....                                       | 2.3                                 | .83                                     | .88                            | 1.4                            | 477                           | 43.5                              | 379                                      | 1.0                            | 181                           | 16.6                              | 220                                      | 10.42           |  |
| 1,000 to 1,599 .....                                   | 2.3                                 | 1.19                                    | .76                            | 1.3                            | 776                           | 70.9                              | 551                                      | 1.0                            | 219                           | 20.0                              | 213                                      | 13.20           |  |
| 1,600 to 1,999 .....                                   | .8                                  | .39                                     | .82                            | .5                             | 591                           | 54.0                              | 470                                      | .3                             | 246                           | 22.5                              | 230                                      | 15.89           |  |
| 2,000 to 2,399 .....                                   | .5                                  | .23                                     | .94                            | .2                             | 882                           | 80.6                              | 775                                      | .3                             | 163                           | 14.9                              | 185                                      | 23.37           |  |
| 2,400 to 2,999 .....                                   | .4                                  | .23                                     | .75                            | .2                             | 960                           | 87.7                              | 654                                      | .2                             | 136                           | 12.4                              | 181                                      | 18.96           |  |
| 3,000 or More .....                                    | .3                                  | .29                                     | .64                            | .2                             | 1,280                         | 116.9                             | 774                                      | .2                             | 286                           | 26.1                              | 240                                      | 21.82           |  |
| <b>Year of Construction</b>                            |                                     |   |                                |                                |                               |                                   |  |                                |                               |                                   |  |                 |  |
| 1939 or Before .....                                   | 1.8                                 | .74                                     | .77                            | .8                             | 660                           | 60.3                              | 414                                      | 1.0                            | 190                           | 17.3                              | 223                                      | 12.49           |  |
| 1940 to 1949 .....                                     | .7                                  | .34                                     | .87                            | .4                             | 738                           | 67.4                              | 601                                      | .3                             | 208                           | 18.9                              | 232                                      | 18.85           |  |
| 1950 to 1959 .....                                     | 1.0                                 | .47                                     | .87                            | .6                             | 709                           | 64.8                              | 592                                      | .4                             | 141                           | 12.8                              | 157                                      | 15.22           |  |
| 1960 to 1969 .....                                     | 1.0                                 | .43                                     | .78                            | .5                             | 628                           | 57.4                              | 458                                      | .5                             | 183                           | 16.7                              | 177                                      | 17.44           |  |
| 1970 to 1974 .....                                     | 1.0                                 | .51                                     | .88                            | .6                             | 672                           | 61.3                              | 535                                      | .3                             | 265                           | 24.2                              | 333                                      | 15.32           |  |
| 1975 to 1979 .....                                     | 1.0                                 | .52                                     | .77                            | .6                             | 746                           | 68.1                              | 545                                      | .4                             | 205                           | 18.8                              | 195                                      | 17.70           |  |
| 1980 to 1984 .....                                     | .8                                  | .29                                     | .76                            | .4                             | 512                           | 46.7                              | 362                                      | .4                             | 193                           | 17.6                              | 169                                      | 20.03           |  |
| 1985 or After .....                                    | .3                                  | .15                                     | .88                            | .2                             | 657                           | 60.0                              | 549                                      | Q                              | Q                             | Q                                 | Q  | 21.30           |  |
| <b>Status of Unit</b>                                  |                                     |   |                                |                                |                               |                                   |  |                                |                               |                                   |  |                 |  |
| Owned .....  | 6.2                                 | 2.91                                    | .81                            | 3.4                            | 689                           | 63.0                              | 517                                      | 2.8                            | 202                           | 18.5                              | 215                                      | 8.21            |  |
| Rented .....   | 1.5                                 | .54                                     | .83                            | .7                             | 575                           | 52.6                              | 419                                      | .7                             | 155                           | 14.2                              | 185                                      | 14.33           |  |
| <b>1987 Family Income</b>                              |                                     |   |                                |                                |                               |                                   |  |                                |                               |                                   |  |                 |  |
| Less than \$5,000 .....                                | .9                                  | .36                                     | .86                            | .6                             | 487                           | 44.5                              | 402                                      | .3                             | 187                           | 17.1                              | 203                                      | 15.91           |  |
| \$5,000 to \$9,999 .....                               | 1.4                                 | .49                                     | .85                            | .6                             | 652                           | 59.5                              | 517                                      | .8                             | 142                           | 12.9                              | 145                                      | 16.98           |  |
| \$10,000 to \$14,999 .....                             | 1.3                                 | .66                                     | .77                            | 1.0                            | 646                           | 59.0                              | 468                                      | .4                             | 125                           | 11.4                              | 175                                      | 18.51           |  |
| \$15,000 to \$19,999 .....                             | .7                                  | .38                                     | .84                            | .4                             | 669                           | 61.1                              | 489                                      | .3                             | 304                           | 27.8                              | 366                                      | 17.18           |  |
| \$20,000 to \$24,999 .....                             | .8                                  | .38                                     | .77                            | .4                             | 730                           | 66.7                              | 516                                      | .4                             | 187                           | 17.1                              | 197                                      | 16.61           |  |
| \$25,000 to \$34,999 .....                             | 1.3                                 | .56                                     | .84                            | .6                             | 727                           | 66.4                              | 544                                      | .7                             | 190                           | 17.3                              | 210                                      | 12.54           |  |
| \$35,000 to \$49,999 .....                             | .6                                  | .31                                     | .76                            | .3                             | 755                           | 69.0                              | 548                                      | .3                             | 202                           | 18.4                              | 179                                      | 17.33           |  |
| \$50,000 or More .....                                 | .6                                  | .33                                     | .81                            | .2                             | 907                           | 82.8                              | 657                                      | .3                             | 323                           | 29.5                              | 328                                      | 19.17           |  |
| <b>Below 100 Percent of Poverty Line</b>               |                                     |   |                                |                                |                               |                                   |  |                                |                               |                                   |  |                 |  |
| Below 100 Percent of Poverty Line .....                | 1.6                                 | .72                                     | .78                            | 1.0                            | 599                           | 54.7                              | 439                                      | .7                             | 209                           | 19.1                              | 199                                      | 15.90           |  |
| <b>Below 125 Percent of Poverty Line</b>               |                                     |   |                                |                                |                               |                                   |  |                                |                               |                                   |  |                 |  |
| Below 125 Percent of Poverty Line .....                | 2.5                                 | 1.03                                    | .82                            | 1.3                            | 645                           | 58.9                              | 487                                      | 1.2                            | 172                           | 15.7                              | 183                                      | 13.32           |  |
| <b>Assistance for Heating in Winter</b>                |                                     |   |                                |                                |                               |                                   |  |                                |                               |                                   |  |                 |  |
| Yes .....  | .8                                  | .42                                     | .70                            | .4                             | 795                           | 72.6                              | 528                                      | .4                             | 248                           | 22.7                              | 211                                      | 21.00           |  |
| No .....   | 6.9                                 | 3.03                                    | .83                            | 3.7                            | 655                           | 59.8                              | 497                                      | 3.2                            | 186                           | 17.0                              | 209                                      | 8.23            |  |
| <b>Assistance for Weatherization of Residence</b>      |                                     |   |                                |                                |                               |                                   |  |                                |                               |                                   |  |                 |  |
| Yes .....  | Q                                   | Q                                       | Q                              | Q                              | Q                             | Q                                 | Q  | Q                              | Q                             | Q                                 | Q  | a               |  |
| No .....   | 7.6                                 | 3.39                                    | .81                            | 4.1                            | 667                           | 60.9                              | 499                                      | 3.5                            | 193                           | 17.6                              | 208                                      | 7.97            |  |
| <b>Household Owns or Has Regular Use of a Vehicle</b>  |                                     |   |                                |                                |                               |                                   |  |                                |                               |                                   |  |                 |  |
| Yes .....  | 7.1                                 | 3.17                                    | .80                            | 3.8                            | 666                           | 60.9                              | 490                                      | 3.2                            | 192                           | 17.5                              | 208                                      | 8.22            |  |
| No .....   | .6                                  | .28                                     | .94                            | .3                             | 704                           | 64.3                              | 629                                      | .3                             | 205                           | 18.7                              | 222                                      | 19.85           |  |

See footnotes at end of table.

**Table 20. Household Liquefied Petroleum Gas Consumption and Expenditures, 1987 (Continued)**

| Household Characteristics                  | Liquefied Petroleum Gas (LPG) Used: |   |                                |                                |                               |                                   |  |                                |                               |                                   |  | RSE Row Factors |  |
|--|-------------------------------------|---|--------------------------------|--------------------------------|-------------------------------|-----------------------------------|--|--------------------------------|-------------------------------|-----------------------------------|--|-----------------|--|
|  | Number of Households (million)      | Total Amount Consumed (billion gallons) | Avg Price (dollars per gallon) | As Main Heating Fuel           |                               |                                   |  | Not as Main Heating Fuel       |                               |                                   |  |                 |  |
|  |                                     |   |                                | Number of Households (million) | Avg Amount Consumed (gallons) | Avg Amount Consumed (million Btu) | Avg Expenditures per Household (dollars) | Number of Households (million) | Avg Amount Consumed (gallons) | Avg Amount Consumed (million Btu) | Avg Expenditures per Household (dollars) |                 |  |
| RSE Column Factors:                        | 1.177                               | 1.509                                   | 0.418                          | 1.491                          | 0.706                         | 0.706                             | 0.638                                    | 1.404                          | 1.328                         | 1.328                             | 1.145                                    |                 |  |
| <b>Race of Householder</b>                 |                                     |   |                                |                                |                               |                                   |  |                                |                               |                                   |  |                 |  |
| White .....                                | 6.7                                 | 3.05                                    | 0.81                           | 3.6                            | 681                           | 62.2                              | 512                                      | 3.1                            | 186                           | 17.0                              | 201                                      | 7.97            |  |
| Black .....                                | .8                                  | .25                                     | .88                            | .4                             | 452                           | 41.3                              | 361                                      | .3                             | 194                           | 17.7                              | 217                                      | 15.80           |  |
| Other .....                                | .2                                  | Q                                       | .68                            | Q                              | Q                             | Q                                 | Q  | .1                             | 338                           | 30.8                              | 358                                      | 29.89           |  |
| <b>Householder of Hispanic Descent</b>     |                                     |   |                                |                                |                               |                                   |  |                                |                               |                                   |  |                 |  |
| Yes .....                                  | .2                                  | .13                                     | .68                            | Q                              | Q                             | Q                                 | Q  | Q                              | Q                             | Q                                 | Q  | 31.54           |  |
| No .....                                   | 7.5                                 | 3.32                                    | .82                            | 4.0                            | 664                           | 60.7                              | 498                                      | 3.5                            | 191                           | 17.5                              | 209                                      | 8.07            |  |
| <b>Age of Householder</b>                  |                                     |   |                                |                                |                               |                                   |  |                                |                               |                                   |  |                 |  |
| Under 25 Years .....                       | .4                                  | .14                                     | 1.01                           | .2                             | 514                           | 47.0                              | 373                                      | .2                             | 172                           | 15.7                              | Q  | 25.65           |  |
| 25 to 34 Years .....                       | 1.6                                 | .66                                     | .80                            | .8                             | 666                           | 60.9                              | 493                                      | .8                             | 192                           | 17.5                              | 188                                      | 12.21           |  |
| 35 to 44 Years .....                       | 1.5                                 | .61                                     | .79                            | .5                             | 791                           | 72.2                              | 519                                      | 1.0                            | 220                           | 20.1                              | 227                                      | 15.18           |  |
| 45 to 59 Years .....                       | 1.8                                 | .84                                     | .81                            | 1.1                            | 636                           | 58.0                              | 484                                      | .7                             | 189                           | 17.3                              | 201                                      | 10.92           |  |
| 60 Years and Over .....                    | 2.4                                 | 1.21                                    | .82                            | 1.6                            | 674                           | 61.6                              | 524                                      | .8                             | 171                           | 15.7                              | 191                                      | 13.21           |  |
| <b>Household Size</b>                      |                                     |   |                                |                                |                               |                                   |  |                                |                               |                                   |  |                 |  |
| 1 Person .....                             | 1.5                                 | .69                                     | .82                            | 1.0                            | 630                           | 57.5                              | 492                                      | .5                             | 136                           | 12.4                              | 153                                      | 15.47           |  |
| 2 Persons .....                            | 2.5                                 | 1.09                                    | .81                            | 1.4                            | 604                           | 55.2                              | 459                                      | 1.1                            | 201                           | 18.3                              | 206                                      | 10.08           |  |
| 3 Persons .....                            | 1.3                                 | .52                                     | .83                            | .7                             | 635                           | 58.0                              | 486                                      | .6                             | 152                           | 13.9                              | 174                                      | 13.06           |  |
| 4 Persons .....                            | 1.5                                 | .71                                     | .81                            | .6                             | 893                           | 81.6                              | 625                                      | .9                             | 227                           | 20.7                              | 246                                      | 14.21           |  |
| 5 Persons .....                            | .5                                  | .22                                     | .80                            | .2                             | 687                           | 62.8                              | 480                                      | .3                             | 201                           | 18.4                              | 225                                      | 17.55           |  |
| 6 or More Persons .....                    | 4                                   | .23                                     | .79                            | .2                             | 769                           | 70.2                              | 544                                      | .2                             | 273                           | 25.0                              | 310                                      | 24.23           |  |
| <b>Secondary Heating</b>                   |                                     |   |                                |                                |                               |                                   |  |                                |                               |                                   |  |                 |  |
| Yes .....                                  | 4.2                                 | 1.98                                    | .82                            | 2.3                            | 665                           | 60.7                              | 515                                      | 1.9                            | 256                           | 23.3                              | 245                                      | 9.68            |  |
| Over 33 Percent of Home's Total Heat ..... | .6                                  | .17                                     | .90                            | .3                             | 354                           | 32.3                              | 304                                      | .3                             | 196                           | 17.9                              | 195                                      | 21.27           |  |
| No .....                                   | 3.5                                 | 1.47                                    | .80                            | 1.9                            | 674                           | 61.6                              | 481                                      | 1.6                            | 119                           | 10.9                              | 166                                      | 9.83            |  |
| <b>Main Heating Equipment Using LPG</b>    |                                     |   |                                |                                |                               |                                   |  |                                |                               |                                   |  |                 |  |
| Central Warm Air Furnace .....             | 2.4                                 | 1.84                                    | .73                            | 2.4                            | 762                           | 69.6                              | 554                                      | --                             | --                            | --                                | --                                       | 7.75            |  |
| Other/None .....                           | 5.3                                 | 1.61                                    | .91                            | 1.7                            | 539                           | 49.2                              | 424                                      | 3.5                            | 193                           | 17.6                              | 209                                      | 10.36           |  |

-- Data not applicable.

\* No applicable RSE row factor.

NC No cases in sample.

Q Data withheld either because the RSE was greater than 50 percent or fewer than 10 households were sampled.

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

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Form EIA-457 A, B, C, D of the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).

## WOOD CONSUMPTION

**Table 21. Household Wood Consumption for the Year Ending November 1987**

| Household Characteristics                  |  |           | Total Amount Consumed |                   |           | Mean Amount Consumed per Household | Median Amount Consumed per Household |         |               |
|--|--|-----------|-----------------------|-------------------|-----------|------------------------------------|--------------------------------------|---------|---------------|
|  | Number of Households Burning Wood<br>(million) | (percent) | (million cords)       | (quadrillion Btu) | (percent) | (cords)                            | (million Btu)                        | (cords) | (million Btu) |
| <b>Total U.S. Households</b>               | 22.5   | 100.0     | 42.6                  | 0.85              | 100.0     | 1.9                                | 38.0                                 | 0.7     | 14.0          |
| <b>Census Region and Division</b>          |  |           |                       |                   |           |                                    |                                      |         |               |
| Northeast                                  | 3.7  | 16.6      | 8.3                   | .17               | 19.6      | 2.2                                | 44.7                                 | .7      | 14.0          |
| New England                                | 1.2  | 5.3       | 2.1                   | .04               | 5.0       | 1.8                                | 35.5                                 | 1.0     | 20.0          |
| Middle Atlantic                            | 2.5  | 11.3      | 6.2                   | .12               | 14.6      | 2.5                                | 49.1                                 | .7      | 14.0          |
| Midwest                                    | 5.2  | 22.9      | 12.5                  | .25               | 29.2      | 2.4                                | 48.4                                 | 1.0     | 20.0          |
| East North Central                         | 3.7  | 16.7      | 9.4                   | .19               | 22.0      | 2.5                                | 50.2                                 | .7      | 14.0          |
| West North Central                         | 1.4  | 6.3       | 3.1                   | .06               | 7.2       | 2.2                                | 43.6                                 | 1.0     | 20.0          |
| South                                      | 7.5  | 33.6      | 13.2                  | .26               | 31.0      | 1.8                                | 35.1                                 | .7      | 14.0          |
| South Atlantic                             | 3.8  | 17.1      | 6.8                   | .14               | 16.0      | 1.8                                | 35.5                                 | .7      | 14.0          |
| East South Central                         | 1.7  | 7.5       | 4.0                   | .08               | 9.4       | 2.4                                | 47.9                                 | 1.5     | 30.0          |
| West South Central                         | 2.0  | 9.0       | 2.4                   | .05               | 5.6       | 1.2                                | 23.7                                 | .5      | 10.0          |
| West                                       | 6.0  | 26.8      | 8.6                   | .17               | 20.2      | 1.4                                | 28.5                                 | .5      | 10.0          |
| Mountain                                   | 1.3  | 5.8       | 1.3                   | .03               | 3.1       | 1.0                                | 20.1                                 | .3      | 6.0           |
| Pacific                                    | 4.7  | 21.0      | 7.3                   | .15               | 17.1      | 1.5                                | 30.8                                 | .7      | 14.0          |
| <b>Metropolitan Status</b>                 |  |           |                       |                   |           |                                    |                                      |         |               |
| Metropolitan                               | 15.9   | 71.0      | 21.6                  | .43               | 50.6      | 1.4                                | 27.1                                 | .5      | 10.0          |
| Central City                               | 4.2  | 18.5      | 3.7                   | .07               | 8.6       | .9                                 | 17.6                                 | .3      | 6.0           |
| Outside Central City                       | 11.8   | 52.4      | 17.9                  | .36               | 42.1      | 1.5                                | 30.5                                 | .5      | 10.0          |
| Nonmetropolitan                            | 6.5  | 29.0      | 21.0                  | .42               | 49.4      | 3.2                                | 64.5                                 | 2.0     | 40.0          |
| <b>Climate Zone</b>                        |  |           |                       |                   |           |                                    |                                      |         |               |
| Under 2,000 CDD and—<br>Over 7,000 HDD     | 2.9  | 13.0      | 12.8                  | .26               | 30.0      | 4.4                                | 88.0                                 | 2.5     | 50.0          |
| 5,500 to 7,000 HDD                         | 6.6  | 29.3      | 10.2                  | .20               | 24.0      | 1.6                                | 31.2                                 | .5      | 10.0          |
| 4,000 to 5,499 HDD                         | 5.0  | 22.4      | 8.8                   | .18               | 20.7      | 1.8                                | 35.1                                 | 1.0     | 20.0          |
| Under 4,000 HDD                            | 4.8  | 21.5      | 7.7                   | .15               | 18.0      | 1.6                                | 31.7                                 | .7      | 14.0          |
| 2,000 CDD or More and—<br>Under 4,000 HDD  | 3.1  | 13.9      | 3.1                   | .06               | 7.3       | 1.0                                | 19.9                                 | .5      | 10.0          |
| <b>Payment Method for Utilities</b>        |  |           |                       |                   |           |                                    |                                      |         |               |
| All Paid by Household                      | 21.7   | 96.6      | 41.8                  | .84               | 98.1      | 1.9                                | 38.5                                 | .7      | 14.0          |
| Some Paid, Some in Rent                    | .3   | 1.4       | .1                    | .Q                | .2        | .3                                 | 5.2                                  | Q       | Q             |
| All Included in Rent                       | 1  | .7        | .3                    | .01               | .7        | .9                                 | 38.1                                 | Q       | Q             |
| Other Method                               | .3   | 1.3       | .5                    | .01               | 1.1       | 1.6                                | 32.4                                 | Q       | Q             |
| <b>Housing Structure by Status of Unit</b> |  |           |                       |                   |           |                                    |                                      |         |               |
| Single-Family Detached                     | 19.4   | 86.2      | 37.0                  | .74               | 86.7      | 1.9                                | 38.2                                 | .7      | 14.0          |
| Owned                                      | 17.6   | 78.5      | 32.0                  | .64               | 75.1      | 1.8                                | 36.3                                 | .7      | 14.0          |
| Rented                                     | 1.7  | 7.6       | 5.0                   | .10               | 11.6      | 2.9                                | 57.7                                 | 2.0     | 40.0          |
| Single-Family Attached                     | .8   | 3.8       | 1.7                   | .03               | 3.9       | 2.0                                | 39.5                                 | .3      | 6.0           |
| Owned                                      | .8   | 3.5       | 1.6                   | .03               | 3.8       | 2.1                                | 41.2                                 | .3      | 6.0           |
| Rented                                     | .9   | 4.0       | 1.5                   | .03               | 3.5       | 1.7                                | 33.3                                 | .5      | 10.0          |
| Building of 2 to 4 Units                   | .4   | 1.8       | .7                    | .01               | 1.6       | 1.6                                | 32.5                                 | Q       | Q             |
| Owned                                      | .4   | 1.8       | .8                    | .02               | 2.0       | 1.7                                | 34.0                                 | .5      | 10.0          |
| Rented                                     | .5   | 2.2       | .8                    | .01               | 7         | .5                                 | 10.9                                 | Q       | Q             |
| Building of 5 or More Units                | .6   | 2.6       | .3                    | .01               | Q         | Q                                  | Q                                    | Q       | Q             |
| Owned                                      | Q  | Q         | Q                     | Q                 | Q         | Q                                  | Q                                    | Q       | Q             |
| Rented                                     | 5  | 2.1       | .3                    | .01               | 7         | .6                                 | 12.3                                 | Q       | Q             |
| Mobile Home                                | .8   | 3.5       | 2.2                   | .04               | 5.1       | 2.8                                | 55.4                                 | 2.0     | 40.0          |
| Owned                                      | 7  | 3.3       | 1.9                   | .04               | 4.5       | 2.6                                | 52.5                                 | 2.0     | 40.0          |
| Rented                                     | Q  | Q         | Q                     | Q                 | Q         | Q                                  | Q                                    | Q       | Q             |

See footnotes at end of table.

**Table 21. Household Wood Consumption for the Year Ending November 1987 (Continued)**

| Household Characteristics                              | Number of Households Burning Wood |           | Total Amount Consumed |                   |           | Mean Amount Consumed per Household |               | Median Amount Consumed per Household |               |
|--|-----------------------------------|-----------|-----------------------|-------------------|-----------|------------------------------------|---------------|--------------------------------------|---------------|
|  | (million)                         | (percent) | (million cords)       | (quadrillion Btu) | (percent) | (cords)                            | (million Btu) | (cords)                              | (million Btu) |
| <b>Number of Rooms</b>                                 |                                   |           |                       |                   |           |                                    |               |                                      |               |
| 1 to 3 .....   | 1.0                               | 4.6       | 2.0                   | 0.04              | 4.8       | 2.0                                | 39.3          | 0.7                                  | 14.0          |
| 4 .....  | 2.3                               | 10.1      | 5.7                   | .11               | 13.4      | 2.5                                | 50.5          | 2.0                                  | 40.0          |
| 5 .....  | 4.4                               | 19.4      | 8.8                   | .18               | 20.8      | 2.0                                | 40.5          | 1.0                                  | 20.0          |
| 6 .....  | 5.3                               | 23.7      | 11.3                  | .23               | 26.6      | 2.1                                | 42.6          | .7                                   | 14.0          |
| 7 .....  | 4.4                               | 19.6      | 7.8                   | .16               | 18.3      | 1.8                                | 35.5          | .7                                   | 14.0          |
| 8 or More .....  | 5.1                               | 22.6      | 6.9                   | .14               | 16.1      | 1.4                                | 27.1          | .3                                   | 6.0           |
| <b>Number of Rooms That Can Be Air Conditioned</b>     |                                   |           |                       |                   |           |                                    |               |                                      |               |
| All .....  | 9.8                               | 43.6      | 11.0                  | .22               | 25.9      | 1.1                                | 22.5          | .5                                   | 10.0          |
| Some .....   | 3.5                               | 15.5      | 5.8                   | .12               | 13.7      | 1.7                                | 33.4          | .5                                   | 10.0          |
| None .....   | 9.2                               | 40.9      | 25.8                  | .52               | 60.4      | 2.8                                | 56.1          | 1.3                                  | 26.0          |
| <b>Measured Heated Area of Residence (square feet)</b> |                                   |           |                       |                   |           |                                    |               |                                      |               |
| Fewer than 600 .....                                   | .6                                | 2.7       | 2.9                   | .06               | 6.7       | 4.7                                | 94.3          | 3.0                                  | 60.0          |
| 600 to 999 .....                                       | 2.6                               | 11.7      | 5.8                   | .12               | 13.6      | 2.2                                | 43.9          | 1.5                                  | 30.0          |
| 1,000 to 1,599 .....                                   | 6.5                               | 28.8      | 14.1                  | .28               | 33.0      | 2.2                                | 43.6          | 1.0                                  | 20.0          |
| 1,600 to 1,999 .....                                   | 3.4                               | 15.3      | 5.6                   | .11               | 13.0      | 1.6                                | 32.3          | .7                                   | 14.0          |
| 2,000 to 2,399 .....                                   | 3.4                               | 15.0      | 4.5                   | .09               | 10.5      | 1.3                                | 26.6          | .5                                   | 10.0          |
| 2,400 to 2,999 .....                                   | 3.2                               | 14.4      | 6.3                   | .13               | 14.7      | 1.9                                | 38.7          | .5                                   | 10.0          |
| 3,000 or More .....                                    | 2.7                               | 12.0      | 3.6                   | .07               | 8.4       | 1.3                                | 26.7          | .3                                   | 6.0           |
| <b>Year of Construction</b>                            |                                   |           |                       |                   |           |                                    |               |                                      |               |
| 1939 or Before .....                                   | 4.2                               | 18.6      | 12.5                  | .25               | 29.4      | 3.0                                | 60.1          | 1.5                                  | 30.0          |
| 1940 to 1949 .....                                     | 1.7                               | 7.7       | 3.9                   | .08               | 9.1       | 2.2                                | 44.9          | .7                                   | 14.0          |
| 1950 to 1959 .....                                     | 2.9                               | 12.8      | 4.2                   | .08               | 9.8       | 1.4                                | 29.0          | .5                                   | 10.0          |
| 1960 to 1969 .....                                     | 3.7                               | 16.7      | 5.0                   | .10               | 11.7      | 1.3                                | 26.8          | .5                                   | 10.0          |
| 1970 to 1974 .....                                     | 2.3                               | 10.3      | 3.2                   | .06               | 7.5       | 1.4                                | 27.6          | .5                                   | 10.0          |
| 1975 to 1979 .....                                     | 3.8                               | 16.9      | 7.1                   | .14               | 16.7      | 1.9                                | 37.4          | .5                                   | 10.0          |
| 1980 to 1984 .....                                     | 2.9                               | 12.7      | 5.2                   | .10               | 12.2      | 1.8                                | 36.5          | 1.0                                  | 20.0          |
| 1985 or After .....                                    | 1.0                               | 4.3       | 1.5                   | .03               | 3.6       | 1.6                                | 31.3          | 1.0                                  | 20.0          |
| <b>Status of Unit</b>                                  |                                   |           |                       |                   |           |                                    |               |                                      |               |
| Owned .....  | 19.7                              | 87.6      | 36.3                  | .73               | 85.1      | 1.8                                | 36.9          | .7                                   | 14.0          |
| Condominium .....                                      | .4                                | 1.7       | .1                    | Q                 | .2        | .2                                 | 4.7           | Q                                    | Q             |
| Not a Condominium .....                                | 19.3                              | 85.9      | 36.2                  | .72               | 84.8      | 1.9                                | 37.5          | .7                                   | 14.0          |
| Rented .....   | 2.8                               | 12.4      | 6.4                   | .13               | 14.9      | 2.3                                | 45.7          | 1.0                                  | 20.0          |
| <b>1987 Family Income</b>                              |                                   |           |                       |                   |           |                                    |               |                                      |               |
| Less than \$5,000 .....                                | .7                                | 3.3       | 2.1                   | .04               | 4.9       | 2.8                                | 56.6          | 2.0                                  | 40.0          |
| \$5,000 to \$9,999 .....                               | 1.4                               | 6.1       | 4.8                   | .10               | 11.2      | 3.5                                | 69.6          | 2.5                                  | 50.0          |
| \$10,000 to \$14,999 .....                             | 2.1                               | 9.5       | 6.9                   | .14               | 16.1      | 3.2                                | 64.4          | 1.5                                  | 30.0          |
| \$15,000 to \$19,999 .....                             | 1.5                               | 6.7       | 3.1                   | .06               | 7.2       | 2.0                                | 40.8          | 1.0                                  | 20.0          |
| \$20,000 to \$24,999 .....                             | 2.1                               | 9.2       | 5.5                   | .11               | 13.0      | 2.7                                | 53.9          | 1.0                                  | 20.0          |
| \$25,000 to \$34,999 .....                             | 4.0                               | 17.7      | 7.9                   | .16               | 18.4      | 2.0                                | 39.6          | .7                                   | 14.0          |
| \$35,000 to \$49,999 .....                             | 4.9                               | 21.8      | 6.6                   | .13               | 15.5      | 1.3                                | 27.0          | .5                                   | 10.0          |
| \$50,000 or More .....                                 | 5.8                               | 25.7      | 5.8                   | .12               | 13.6      | 1.0                                | 20.1          | .3                                   | 6.0           |

See footnotes at end of table.

## WOOD CONSUMPTION

**Table 21. Household Wood Consumption for the Year Ending November 1987 (Continued)**

| Household Characteristics                             | Number of Households Burning Wood |           | Total Amount Consumed |                   | Mean Amount Consumed per Household | Median Amount Consumed per Household |         |               |      |
|---|-----------------------------------|-----------|-----------------------|-------------------|------------------------------------|--------------------------------------|---------|---------------|------|
|   | (million)                         | (percent) | (million cords)       | (quadrillion Btu) | (percent)                          | (million Btu)                        | (cords) | (million Btu) |      |
| Below 100 Percent of Poverty Line .....               | 1.7                               | 7.4       | 5.6                   | 0.11              | 13.2                               | 3.4                                  | 67.9    | 2.5           | 50.0 |
| Below 125 Percent of Poverty Line .....               | 2.6                               | 11.4      | 8.5                   | .17               | 19.9                               | 3.3                                  | 66.4    | 2.0           | 40.0 |
| <b>Assistance for Heating in Winter</b>               |                                   |           |                       |                   |                                    |                                      |         |               |      |
| Yes .....   | .7                                | 3.0       | 3.1                   | .06               | 7.2                                | 4.5                                  | 89.5    | 4.0           | 80.0 |
| No .....  | 21.8                              | 97.0      | 39.6                  | .79               | 92.8                               | 1.8                                  | 36.4    | .7            | 14.0 |
| <b>Assistance for Weatherization of Residence</b>     |                                   |           |                       |                   |                                    |                                      |         |               |      |
| Yes .....   | .2                                | .9        | .9                    | .02               | 2.1                                | 4.7                                  | 94.4    | Q             | Q    |
| No .....  | 22.3                              | 99.1      | 41.7                  | .83               | 97.9                               | 1.9                                  | 37.5    | .7            | 14.0 |
| <b>Household Owns or Has Regular Use of a Vehicle</b> |                                   |           |                       |                   |                                    |                                      |         |               |      |
| Yes .....   | 21.8                              | 96.8      | 40.6                  | .81               | 95.3                               | 1.9                                  | 37.3    | .7            | 14.0 |
| No .....  | .7                                | 3.2       | 2.0                   | .04               | 4.7                                | 2.8                                  | 56.8    | 2.0           | 40.0 |
| <b>Race of Householder</b>                            |                                   |           |                       |                   |                                    |                                      |         |               |      |
| White .....   | 21.0                              | 93.5      | 38.9                  | .80               | 93.7                               | 1.9                                  | 38.1    | .7            | 14.0 |
| Black .....   | 1.1                               | 4.9       | 2.0                   | .04               | 4.8                                | 1.9                                  | 37.1    | 1.0           | 20.0 |
| Other .....   | .4                                | 1.6       | .7                    | .01               | 1.5                                | 1.8                                  | 35.5    | Q             | Q    |
| <b>Householder of Hispanic Descent</b>                |                                   |           |                       |                   |                                    |                                      |         |               |      |
| Yes .....   | .7                                | 3.1       | .9                    | .02               | 2.0                                | 1.3                                  | 25.1    | 3             | 6.0  |
| No .....  | 21.8                              | 96.9      | 41.8                  | .84               | 98.0                               | 1.9                                  | 38.4    | .7            | 14.0 |
| <b>Age of Householder</b>                             |                                   |           |                       |                   |                                    |                                      |         |               |      |
| Under 25 Years .....                                  | .6                                | 2.6       | 1.7                   | .03               | 3.9                                | 2.8                                  | 56.1    | 1.5           | 30.0 |
| 25 to 34 Years .....                                  | 4.9                               | 21.9      | 8.2                   | .16               | 19.3                               | 1.7                                  | 33.5    | .5            | 10.0 |
| 35 to 44 Years .....                                  | 5.8                               | 26.0      | 11.0                  | .22               | 25.7                               | 1.9                                  | 37.5    | .5            | 10.0 |
| 45 to 59 Years .....                                  | 6.1                               | 27.1      | 10.7                  | .21               | 25.1                               | 1.8                                  | 35.2    | .7            | 14.0 |
| 60 Years and Over .....                               | 5.0                               | 22.4      | 11.1                  | .22               | 26.0                               | 2.2                                  | 44.1    | 1.0           | 20.0 |
| <b>Household Size</b>                                 |                                   |           |                       |                   |                                    |                                      |         |               |      |
| 1 Person .....  | .8                                | 12.3      | 4.1                   | .08               | 9.6                                | 1.5                                  | 29.6    | .5            | 10.0 |
| 2 Persons .....                                       | 8.0                               | 35.5      | 14.8                  | .30               | 34.7                               | 1.9                                  | 37.1    | .7            | 14.0 |
| 3 Persons .....                                       | 4.0                               | 17.9      | 8.2                   | .16               | 19.3                               | 2.0                                  | 41.0    | .7            | 14.0 |
| 4 Persons .....                                       | 4.4                               | 19.8      | 8.5                   | .17               | 19.9                               | 1.9                                  | 38.2    | 1.0           | 20.0 |
| 5 Persons .....                                       | 2.4                               | 10.5      | 4.2                   | .08               | 9.9                                | 1.8                                  | 35.9    | 1.0           | 20.0 |
| 6 or More Persons .....                               | .9                                | 4.0       | 2.8                   | .06               | 6.6                                | 3.1                                  | 62.2    | .7            | 14.0 |
| <b>Secondary Heating</b>                              |                                   |           |                       |                   |                                    |                                      |         |               |      |
| Yes .....   | 21.3                              | 94.8      | 37.1                  | .74               | 86.9                               | 1.7                                  | 34.8    | .7            | 14.0 |
| Over 33 Percent of Home's Total Heat .....            | 2.3                               | 10.2      | 7.6                   | .15               | 17.8                               | 3.3                                  | 66.1    | 2.0           | 40.0 |
| No .....  | 1.2                               | 5.2       | 5.6                   | .11               | 13.1                               | 4.8                                  | 95.2    | 4.0           | 80.0 |

See footnotes at end of table.

**Table 21. Household Wood Consumption for the Year Ending November 1987 (Continued)**

| Household Characteristics    | Number of Households Burning Wood |           | Total Amount Consumed |                   |           | Mean Amount Consumed per Household |               | Median Amount Consumed per Household |               |
|------------------------------|-----------------------------------|-----------|-----------------------|-------------------|-----------|------------------------------------|---------------|--------------------------------------|---------------|
|                              | (million)                         | (percent) | (million cords)       | (quadrillion Btu) | (percent) | (cords)                            | (million Btu) | (cords)                              | (million Btu) |
| <b>Main Heating Fuel</b>     |                                   |           |                       |                   |           |                                    |               |                                      |               |
| Natural Gas .....            | 9.1                               | 40.4      | 6.9                   | 0.14              | 16.3      | 0.8                                | 15.3          | 0.3                                  | 6.0           |
| Fuel Oil or Kerosene .....   | 2.7                               | 12.2      | 5.7                   | .11               | 13.3      | 2.1                                | 41.6          | .5                                   | 10.0          |
| Electricity .....            | 4.3                               | 19.2      | 4.2                   | .08               | 9.8       | 1.0                                | 19.4          | .5                                   | 10.0          |
| Wood .....                   | 5.0                               | 22.4      | 23.5                  | .47               | 55.1      | 4.7                                | 93.4          | 4.0                                  | 80.0          |
| Fireplace .....              | .3                                | 1.2       | .8                    | .02               | 1.8       | 2.8                                | 55.5          | Q                                    | Q             |
| Airtight Stove .....         | 3.9                               | 17.2      | 17.7                  | .35               | 41.4      | 4.6                                | 91.4          | 3.5                                  | 70.0          |
| Nonairtight Stove .....      | .2                                | .9        | 1.1                   | .02               | 2.7       | 5.7                                | 114.3         | Q                                    | Q             |
| Furnace/Other .....          | .7                                | 3.1       | 3.9                   | .08               | 9.2       | 5.6                                | 112.9         | 5.0                                  | 100.0         |
| LPG .....                    | 1.0                               | 4.6       | 2.1                   | .04               | 4.8       | 2.0                                | 39.7          | 1.0                                  | 20.0          |
| Other .....                  | .3                                | 1.3       | .3                    | .01               | .7        | 1.1                                | 22.7          | Q                                    | Q             |
| <b>Amount of Wood Burned</b> |                                   |           |                       |                   |           |                                    |               |                                      |               |
| Less than 0.5 Cord .....     | 8.6                               | 38.4      | 1.6                   | .03               | 3.8       | .2                                 | 3.8           | .1                                   | 2.0           |
| 0.5 to 1.4 Cords .....       | 5.5                               | 24.3      | 4.1                   | .08               | 9.7       | .8                                 | 15.1          | .7                                   | 14.0          |
| 1.5 to 2.4 Cords .....       | 2.8                               | 12.7      | 5.3                   | .11               | 12.4      | 1.9                                | 37.1          | 2.0                                  | 40.0          |
| 2.5 to 3.4 Cords .....       | 1.6                               | 7.2       | 4.7                   | .09               | 11.0      | 2.9                                | 58.0          | 3.0                                  | 60.0          |
| 3.5 to 4.4 Cords .....       | .9                                | 3.9       | 3.4                   | .07               | 8.1       | 3.9                                | 78.5          | 4.0                                  | 80.0          |
| 4.5 Cords or More .....      | 3.0                               | 13.6      | 23.5                  | .47               | 55.1      | 7.7                                | 154.3         | 6.0                                  | 120.0         |

<sup>a</sup> Data withheld because fewer than 10 households were sampled, or, if the statistic is a median, fewer than 25 households were sampled. See Appendix C for a method for calculating RSE's for statistics in this table.

Notes: • Because of rounding, data may not sum to totals. • Percentages are calculated on unrounded numbers. • Relative Standard Error (RSE) row and column factors were not calculated on any table that presented a median value. • See "Glossary" for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Forms EIA-457 A, B, C of the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).

**Table 22. Household Average Energy Prices, 1987**  
(Dollars per Million Btu)

| Household Characteristics                  | RSE Column Factors | Average Energy Prices |             |             |                      |                         | RSE Row Factors |
|--|--------------------|-----------------------|-------------|-------------|----------------------|-------------------------|-----------------|
|  |                    | All Fuels             | Natural Gas | Electricity | Fuel Oil or Kerosene | Liquefied Petroleum Gas |                 |
| Total U.S. Households .....                | 10.71              | 5.41                  | 22.34       | 5.89        | 8.91                 | 1.37                    |                 |
| <b>Census Region and Division</b>          |                    |                       |             |             |                      |                         |                 |
| Northeast .....                            | 10.26              | 6.45                  | 27.78       | 5.79        | 13.24                | 1.76                    |                 |
| New England .....                          | 10.09              | 6.75                  | 26.16       | 5.91        | 11.93                | 2.00                    |                 |
| Middle Atlantic .....                      | 10.30              | 6.40                  | 28.24       | 5.74        | 14.48                | 2.29                    |                 |
| Midwest .....                              | 9.18               | 4.93                  | 23.09       | 5.97        | 7.58                 | 2.18                    |                 |
| East North Central .....                   | 9.17               | 5.01                  | 23.77       | 6.01        | 8.18                 | 2.47                    |                 |
| West North Central .....                   | 9.19               | 4.69                  | 21.60       | 5.74        | 6.52                 | 3.38                    |                 |
| South .....                                | 12.82              | 5.53                  | 20.61       | 6.29        | 9.56                 | 2.75                    |                 |
| South Atlantic .....                       | 13.93              | 6.50                  | 21.57       | 6.24        | 11.55                | 2.99                    |                 |
| East South Central .....                   | 11.79              | 4.92                  | 17.50       | 6.53        | 9.14                 | 2.87                    |                 |
| West South Central .....                   | 11.77              | 4.81                  | 21.31       | 6.11        | 6.96                 | 5.92                    |                 |
| West .....                                 | 10.53              | 5.05                  | 20.76       | 6.11        | 9.30                 | 4.92                    |                 |
| Mountain .....                             | 9.12               | 4.54                  | 21.26       | 5.54        | 6.41                 | 10.95                   |                 |
| Pacific .....                              | 11.21              | 5.34                  | 20.58       | 6.27        | 11.35                | 4.49                    |                 |
| <b>Metropolitan Status</b>                 |                    |                       |             |             |                      |                         |                 |
| Metropolitan .....                         | 10.62              | 5.47                  | 23.03       | 5.85        | 9.72                 | 1.57                    |                 |
| Central City .....                         | 9.89               | 5.48                  | 23.25       | 5.57        | 11.57                | 2.67                    |                 |
| Outside Central City .....                 | 11.14              | 5.47                  | 22.91       | 6.00        | 9.45                 | 1.85                    |                 |
| Nonmetropolitan .....                      | 11.06              | 5.10                  | 20.27       | 6.04        | 8.34                 | 2.45                    |                 |
| <b>Climate Zone</b>                        |                    |                       |             |             |                      |                         |                 |
| Under 2,000 CDD and—                       |                    |                       |             |             |                      |                         |                 |
| Over 7,000 HDD .....                       | 9.33               | 5.02                  | 20.70       | 5.81        | 8.03                 | 3.45                    |                 |
| 5,500 to 7,000 HDD .....                   | 9.18               | 5.07                  | 23.76       | 6.00        | 6.99                 | 2.42                    |                 |
| 4,000 to 5,499 HDD .....                   | 10.67              | 6.07                  | 22.20       | 5.73        | 8.09                 | 2.84                    |                 |
| Under 4,000 HDD .....                      | 12.03              | 5.63                  | 21.82       | 6.52        | 9.55                 | 2.30                    |                 |
| 2,000 CDD or More and —                    |                    |                       |             |             |                      |                         |                 |
| Under 4,000 HDD .....                      | 14.49              | 5.42                  | 21.98       | 7.90        | 10.66                | 5.05                    |                 |
| <b>Payment Method for Utilities</b>        |                    |                       |             |             |                      |                         |                 |
| All Paid by Household .....                | 10.94              | 5.36                  | 22.01       | 6.09        | 8.89                 | 1.54                    |                 |
| Some Paid, Some in Rent .....              | 9.74               | 5.90                  | 27.74       | 5.12        | 10.78                | 5.27                    |                 |
| All Included in Rent .....                 | 8.27               | 5.22                  | 21.39       | 4.69        | 8.40                 | 4.11                    |                 |
| Other Method .....                         | 10.27              | 5.70                  | 24.94       | 6.10        | Q                    | 4.64                    |                 |
| <b>Housing Structure by Status of Unit</b> |                    |                       |             |             |                      |                         |                 |
| Single-Family Detached .....               | 10.71              | 5.30                  | 21.92       | 6.04        | 8.65                 | 1.62                    |                 |
| Owned .....                                | 10.79              | 5.31                  | 21.94       | 6.03        | 8.66                 | 1.63                    |                 |
| Rented .....                               | 10.13              | 5.25                  | 21.74       | 6.19        | 8.60                 | 2.60                    |                 |
| Single-Family Attached .....               | 11.47              | 5.98                  | 23.81       | 6.38        | Q                    | 4.98                    |                 |
| Owned .....                                | 11.08              | 6.08                  | 24.72       | 6.35        | Q                    | 5.79                    |                 |
| Rented .....                               | 12.15              | 5.58                  | 21.73       | 6.58        | Q                    | 7.18                    |                 |
| Building of 2 to 4 Units .....             | 9.69               | 5.65                  | 24.68       | 6.01        | Q                    | 3.16                    |                 |
| Owned .....                                | 9.57               | 5.73                  | 27.46       | 6.05        | Q                    | 4.70                    |                 |
| Rented .....                               | 9.73               | 5.62                  | 23.93       | 6.00        | Q                    | 2.93                    |                 |
| Building of 5 or More Units .....          | 10.60              | 5.56                  | 23.58       | 4.70        | Q                    | 2.89                    |                 |
| Owned .....                                | 12.64              | 5.53                  | 26.14       | 4.78        | NC                   | 12.85                   |                 |
| Rented .....                               | 10.45              | 5.56                  | 23.35       | 4.68        | Q                    | 2.97                    |                 |
| Mobile Home .....                          | 12.40              | 5.19                  | 20.93       | 6.48        | 9.86                 | 3.25                    |                 |
| Owned .....                                | 12.48              | 5.15                  | 20.74       | 6.56        | 9.76                 | 3.79                    |                 |
| Rented .....                               | 11.96              | 5.38                  | 22.15       | 6.25        | 10.35                | 4.36                    |                 |

See footnotes at end of table.

**Table 22. Household Average Energy Prices, 1987 (Continued)**  
(Dollars per Million Btu)

| Household Characteristics<br>RSE Column Factors:       | Average Energy Prices |             |             |                      |                         | RSE Row Factors |
|--|-----------------------|-------------|-------------|----------------------|-------------------------|-----------------|
|  | All Fuels             | Natural Gas | Electricity | Fuel Oil or Kerosene | Liquefied Petroleum Gas |                 |
|  | 0.825                 | 0.783       | 0.661       | 0.907                | 2.583                   |                 |
| <b>Number of Rooms</b>                                 |                       |             |             |                      |                         |                 |
| 1 .....  | 10.47                 | 5.72        | 25.69       | 5.27                 | Q                       | 16.57           |
| 2 .....  | 9.34                  | 5.03        | 23.52       | 4.72                 | 9.45                    | 6.46            |
| 3 .....  | 10.98                 | 5.52        | 22.99       | 5.10                 | 9.96                    | 3.02            |
| 4 .....  | 10.90                 | 5.47        | 22.11       | 5.80                 | 9.78                    | 2.35            |
| 5 .....  | 10.67                 | 5.37        | 22.03       | 6.02                 | 8.47                    | 1.75            |
| 6 .....  | 10.76                 | 5.38        | 22.63       | 6.00                 | 9.02                    | 1.96            |
| 7 .....  | 10.77                 | 5.46        | 22.40       | 5.98                 | 8.61                    | *1.98           |
| 8 or More .....  | 10.50                 | 5.39        | 22.13       | 6.11                 | 7.67                    | 2.20            |
| <b>Number of Rooms That Can Be Air Conditioned</b>     |                       |             |             |                      |                         |                 |
| All .....  | 12.03                 | 5.33        | 21.76       | 5.91                 | 8.76                    | 1.64            |
| Some .....   | 9.90                  | 5.62        | 24.23       | 5.96                 | 7.92                    | 1.75            |
| None .....   | 9.58                  | 5.38        | 22.44       | 5.83                 | 9.53                    | 1.88            |
| <b>Measured Heated Area of Residence (square feet)</b> |                       |             |             |                      |                         |                 |
| Fewer than 600 .....                                   | 10.70                 | 5.59        | 24.46       | 5.27                 | 10.39                   | 2.53            |
| 600 to 999 .....                                       | 10.69                 | 5.42        | 22.51       | 5.68                 | 9.67                    | 2.01            |
| 1,000 to 1,599 .....                                   | 11.27                 | 5.39        | 21.67       | 6.04                 | 8.32                    | 2.01            |
| 1,600 to 1,999 .....                                   | 10.88                 | 5.47        | 22.31       | 6.10                 | 9.01                    | 1.74            |
| 2,000 to 2,399 .....                                   | 10.46                 | 5.42        | 22.60       | 6.10                 | 10.28                   | 2.59            |
| 2,400 to 2,999 .....                                   | 9.99                  | 5.37        | 22.61       | 5.92                 | 8.25                    | 2.90            |
| 3,000 or More .....                                    | 10.21                 | 5.29        | 22.39       | 5.91                 | 7.02                    | 2.43            |
| <b>Year of Construction</b>                            |                       |             |             |                      |                         |                 |
| 1939 or Before .....                                   | 9.18                  | 5.53        | 24.27       | 5.91                 | 8.41                    | 2.14            |
| 1940 to 1949 .....                                     | 10.05                 | 5.60        | 22.65       | 5.71                 | 9.55                    | 2.37            |
| 1950 to 1959 .....                                     | 10.22                 | 5.33        | 22.97       | 5.97                 | 9.49                    | 2.32            |
| 1960 to 1969 .....                                     | 10.64                 | 5.50        | 22.18       | 5.63                 | 8.53                    | 2.10            |
| 1970 to 1974 .....                                     | 11.14                 | 5.18        | 21.77       | 6.01                 | 9.62                    | 2.86            |
| 1975 to 1979 .....                                     | 13.13                 | 5.00        | 21.20       | 6.17                 | 8.40                    | 2.53            |
| 1980 to 1984 .....                                     | 13.81                 | 5.34        | 20.94       | 6.14                 | 8.28                    | 4.06            |
| 1985 or After .....                                    | 14.76                 | 5.24        | 21.74       | 6.10                 | 9.65                    | 4.97            |
| <b>Status of Unit</b>                                  |                       |             |             |                      |                         |                 |
| Owned .....  | 10.87                 | 5.38        | 22.17       | 6.06                 | 8.88                    | 1.58            |
| Condominium .....                                      | 12.82                 | 5.04        | 24.21       | Q                    | NC                      | 10.88           |
| Not a Condominium .....                                | 10.84                 | 5.39        | 22.13       | 6.06                 | 8.88                    | 1.58            |
| Rented .....   | 10.28                 | 5.48        | 22.83       | 5.44                 | 9.05                    | 1.93            |
| Public Housing .....                                   | 9.38                  | 5.67        | 21.06       | 4.78                 | Q                       | 7.27            |
| Not Public Housing .....                               | 10.34                 | 5.47        | 22.96       | 5.51                 | 9.04                    | 2.17            |
| Rent Subsidy .....                                     | 10.60                 | 6.20        | 24.42       | 4.92                 | Q                       | 5.58            |
| No Rent Subsidy .....                                  | 10.33                 | 5.43        | 22.89       | 5.54                 | 9.05                    | 2.31            |
| <b>1987 Family Income</b>                              |                       |             |             |                      |                         |                 |
| Less than \$5,000 .....                                | 9.91                  | 5.40        | 22.58       | 5.77                 | 9.47                    | 3.06            |
| \$5,000 to \$9,999 .....                               | 9.81                  | 5.33        | 22.10       | 5.76                 | 9.30                    | 2.22            |
| \$10,000 to \$14,999 .....                             | 10.18                 | 5.38        | 22.36       | 5.88                 | 8.47                    | 2.21            |
| \$15,000 to \$19,999 .....                             | 10.47                 | 5.40        | 22.24       | 5.99                 | 9.21                    | 2.39            |
| \$20,000 to \$24,999 .....                             | 10.84                 | 5.25        | 21.87       | 5.99                 | 8.43                    | 2.31            |
| \$25,000 to \$34,999 .....                             | 11.05                 | 5.46        | 22.09       | 5.82                 | 9.17                    | 2.00            |
| \$35,000 to \$49,999 .....                             | 11.20                 | 5.43        | 22.14       | 5.90                 | 8.30                    | 2.09            |
| \$50,000 or More .....                                 | 11.16                 | 5.51        | 23.11       | 5.96                 | 8.92                    | 1.86            |

See footnotes at end of table.

**Table 22. Household Average Energy Prices, 1987 (Continued)**  
(Dollars per Million Btu)

| Household Characteristics                             | Average Energy Prices |             |             |                      |                         | RSE Row Factors |
|---|-----------------------|-------------|-------------|----------------------|-------------------------|-----------------|
|   | All Fuels             | Natural Gas | Electricity | Fuel Oil or Kerosene | Liquefied Petroleum Gas |                 |
|   | RSE Column Factors:   | 0.825       | 0.783       | 0.661                | 0.907                   | 2.583           |
| <b>Below 100 Percent of Poverty Line</b>              |                       |             |             |                      |                         |                 |
| Below 100 Percent of Poverty Line .....               | 10.12                 | 5.43        | 22.34       | 5.75                 | 8.51                    | 2.57            |
| <b>Below 125 Percent of Poverty Line</b>              |                       |             |             |                      |                         |                 |
| Below 125 Percent of Poverty Line .....               | 10.12                 | 5.40        | 22.34       | 5.78                 | 8.93                    | 2.14            |
| <b>Assistance for Heating in Winter</b>               |                       |             |             |                      |                         |                 |
| Yes .....   | 9.46                  | 5.42        | 22.88       | 5.95                 | 7.70                    | 2.99            |
| No .....  | 10.78                 | 5.41        | 22.32       | 5.89                 | 9.08                    | 1.38            |
| <b>Assistance for Weatherization of Residence</b>     |                       |             |             |                      |                         |                 |
| Yes .....   | 9.30                  | 5.38        | 22.68       | 6.14                 | 8.91                    | 4.91            |
| No .....  | 10.72                 | 5.41        | 22.34       | 5.89                 | 8.91                    | 1.38            |
| <b>Household Owns or Has Regular Use of a Vehicle</b> |                       |             |             |                      |                         |                 |
| Yes .....   | 10.89                 | 5.35        | 22.13       | 6.00                 | 8.79                    | 1.42            |
| No .....  | 9.31                  | 5.81        | 25.17       | 5.37                 | 10.28                   | 2.19            |
| <b>Race of Householder</b>                            |                       |             |             |                      |                         |                 |
| White .....   | 10.84                 | 5.33        | 22.17       | 5.93                 | 8.92                    | 1.49            |
| Black .....   | 9.95                  | 5.87        | 23.30       | 5.75                 | 9.67                    | 2.68            |
| Other .....   | 10.26                 | 5.29        | 24.81       | 5.31                 | 7.50                    | 6.16            |
| <b>Householder of Hispanic Descent</b>                |                       |             |             |                      |                         |                 |
| Yes .....   | 11.19                 | 5.46        | 24.73       | 5.34                 | 7.50                    | 3.61            |
| No .....  | 10.68                 | 5.41        | 22.22       | 5.92                 | 8.96                    | 1.37            |
| <b>Age of Householder</b>                             |                       |             |             |                      |                         |                 |
| Under 25 Years .....                                  | 10.87                 | 5.34        | 22.00       | 6.00                 | 11.08                   | 3.45            |
| 25 to 34 Years .....                                  | 10.82                 | 5.39        | 22.46       | 5.79                 | 8.72                    | 1.75            |
| 35 to 44 Years .....                                  | 11.16                 | 5.33        | 22.22       | 5.96                 | 8.64                    | 2.13            |
| 45 to 59 Years .....                                  | 10.95                 | 5.41        | 22.16       | 6.01                 | 8.83                    | 1.80            |
| 60 Years and Over .....                               | 10.06                 | 5.51        | 22.61       | 5.81                 | 8.95                    | 1.83            |
| <b>Household Size</b>                                 |                       |             |             |                      |                         |                 |
| 1 Person .....  | 9.70                  | 5.32        | 22.53       | 5.73                 | 8.93                    | 2.27            |
| 2 Persons .....                                       | 10.83                 | 5.40        | 22.23       | 5.87                 | 8.90                    | 1.43            |
| 3 Persons .....                                       | 11.02                 | 5.45        | 22.11       | 6.06                 | 9.13                    | 1.76            |
| 4 Persons .....                                       | 10.96                 | 5.40        | 22.19       | 5.85                 | 8.88                    | 2.19            |
| 5 Persons .....                                       | 11.11                 | 5.55        | 22.75       | 6.02                 | 8.72                    | 2.36            |
| 6 or More Persons .....                               | 11.07                 | 5.54        | 23.33       | 5.97                 | 8.65                    | 3.44            |
| <b>Secondary Heating</b>                              |                       |             |             |                      |                         |                 |
| Yes .....   | 11.17                 | 5.33        | 21.48       | 6.02                 | 8.99                    | 1.67            |
| Over 33 Percent of Home's Total Heat .....            | 12.26                 | 5.24        | 20.83       | 6.13                 | 9.86                    | 3.36            |
| No .....  | 10.35                 | 5.47        | 23.21       | 5.78                 | 8.80                    | 1.57            |

See footnotes at end of table.

**Table 22. Household Average Energy Prices, 1987 (Continued)**  
(Dollars per Million Btu)

| Household Characteristics<br>RSE Column Factors:    | Average Energy Prices |             |             |                      |                         | RSE Row Factors |
|---|-----------------------|-------------|-------------|----------------------|-------------------------|-----------------|
|   | All Fuels             | Natural Gas | Electricity | Fuel Oil or Kerosene | Liquefied Petroleum Gas |                 |
|   | 0.825                 | 0.783       | 0.661       | 0.907                | 2.583                   |                 |
| <b>Fuel Combinations</b>                            |                       |             |             |                      |                         |                 |
| Use Natural Gas for Main Heat .....                 | 9.10                  | 5.34        | 23.53       | 6.43                 | Q                       | 2.24            |
| Use Natural Gas to Heat Water<br>and Have A/C ..... | 9.41                  | 5.34        | 23.88       | 5.93                 | Q                       | 2.61            |
| and Lack A/C .....                                  | 8.15                  | 5.31        | 24.76       | 6.59                 | NC                      | 3.69            |
| Use Electricity to Heat Water<br>and Have A/C ..... | 10.86                 | 5.64        | 20.37       | 8.42                 | Q                       | 4.32            |
| and Lack A/C .....                                  | 9.12                  | 5.33        | 19.39       | Q                    | NC                      | 4.29            |
| Other .....   | 11.47                 | 5.95        | 26.00       | Q                    | Q                       | 7.90            |
| Use Electricity for Main Heat .....                 | 19.13                 | 5.95        | 20.15       | 7.31                 | 12.78                   | 3.88            |
| Use Electricity to Heat Water<br>and Have A/C ..... | 20.04                 | 8.65        | 20.33       | 7.01                 | 12.95                   | 5.03            |
| and Lack A/C .....                                  | 17.64                 | Q           | 17.91       | 8.25                 | Q                       | 6.84            |
| Other .....   | 15.43                 | 5.65        | 22.62       | Q                    | Q                       | 6.28            |
| Use Fuel Oil for Main Heat .....                    | 9.76                  | 9.33        | 25.49       | 5.79                 | 14.29                   | 3.24            |
| Use Fuel Oil to Heat Water<br>and Have A/C .....    | 9.61                  | 11.00       | 31.84       | 5.73                 | 17.82                   | 3.91            |
| and Lack A/C .....                                  | 8.45                  | 13.05       | 30.30       | 5.60                 | 16.93                   | 3.69            |
| Use Electricity to Heat Water<br>and Have A/C ..... | 10.88                 | Q           | 21.75       | 5.89                 | 16.73                   | 5.30            |
| and Lack A/C .....                                  | 10.52                 | Q           | 20.97       | 5.82                 | 15.73                   | 4.86            |
| Other .....   | 9.86                  | 8.12        | 28.85       | 6.11                 | 12.15                   | 3.28            |
| Use Wood for Main Heat .....                        | 14.90                 | 5.49        | 20.28       | 6.07                 | 10.00                   | 3.23            |
| Use LPG for Main Heat .....                         | 12.58                 | NC          | 21.99       | 7.41                 | 8.18                    | 3.48            |
| Use Kerosene for Main Heat .....                    | 12.74                 | Q           | 21.06       | 6.85                 | 13.47                   | 3.52            |
| Use Coal for Main Heat .....                        | 17.37                 | Q           | 19.92       | Q                    | Q                       | 10.94           |
| No Heating Fuel/Other Fuel .....                    | 23.07                 | 5.63        | 29.64       | Q                    | 16.39                   | 6.20            |

NC No cases in sample.

Q Data withheld either because the RSE was greater than 50 percent or fewer than 10 households were sampled.

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

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Forms EIA-457 A, B, C, D, E, F, G of the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).

## Energy End Use Tables

| Category    | Sub-Category  | Description         | Value | Unit |
|-------------|---------------|---------------------|-------|------|
| Residential | Space Heating | Electric resistance | 1000  | MWh  |
| Residential | Space Heating | Natural Gas         | 1000  | MWh  |
| Residential | Water Heating | Electric resistance | 1000  | MWh  |
| Residential | Water Heating | Natural Gas         | 1000  | MWh  |
| Residential | Appliances    | Electric resistance | 1000  | MWh  |
| Residential | Appliances    | Natural Gas         | 1000  | MWh  |
| Residential | Lighting      | Incandescent        | 1000  | MWh  |
| Residential | Lighting      | LED                 | 1000  | MWh  |
| Residential | Other         | Electric resistance | 1000  | MWh  |
| Residential | Other         | Natural Gas         | 1000  | MWh  |
| Commercial  | Space Heating | Electric resistance | 1000  | MWh  |
| Commercial  | Space Heating | Natural Gas         | 1000  | MWh  |
| Commercial  | Water Heating | Electric resistance | 1000  | MWh  |
| Commercial  | Water Heating | Natural Gas         | 1000  | MWh  |
| Commercial  | Appliances    | Electric resistance | 1000  | MWh  |
| Commercial  | Appliances    | Natural Gas         | 1000  | MWh  |
| Commercial  | Lighting      | Incandescent        | 1000  | MWh  |
| Commercial  | Lighting      | LED                 | 1000  | MWh  |
| Commercial  | Other         | Electric resistance | 1000  | MWh  |
| Commercial  | Other         | Natural Gas         | 1000  | MWh  |
| Industrial  | Space Heating | Electric resistance | 1000  | MWh  |
| Industrial  | Space Heating | Natural Gas         | 1000  | MWh  |
| Industrial  | Water Heating | Electric resistance | 1000  | MWh  |
| Industrial  | Water Heating | Natural Gas         | 1000  | MWh  |
| Industrial  | Appliances    | Electric resistance | 1000  | MWh  |
| Industrial  | Appliances    | Natural Gas         | 1000  | MWh  |
| Industrial  | Lighting      | Incandescent        | 1000  | MWh  |
| Industrial  | Lighting      | LED                 | 1000  | MWh  |
| Industrial  | Other         | Electric resistance | 1000  | MWh  |
| Industrial  | Other         | Natural Gas         | 1000  | MWh  |
| Total       | Space Heating | Electric resistance | 1000  | MWh  |
| Total       | Space Heating | Natural Gas         | 1000  | MWh  |
| Total       | Water Heating | Electric resistance | 1000  | MWh  |
| Total       | Water Heating | Natural Gas         | 1000  | MWh  |
| Total       | Appliances    | Electric resistance | 1000  | MWh  |
| Total       | Appliances    | Natural Gas         | 1000  | MWh  |
| Total       | Lighting      | Incandescent        | 1000  | MWh  |
| Total       | Lighting      | LED                 | 1000  | MWh  |
| Total       | Other         | Electric resistance | 1000  | MWh  |
| Total       | Other         | Natural Gas         | 1000  | MWh  |

## END-USE EXPENDITURES

**Table 23. Expenditures for Energy End Use per Household, 1987**

| Household Characteristics                  | End-Use Expenditures           |                              |               |               |            |                  | RSE Row Factors |
|--|--------------------------------|------------------------------|---------------|---------------|------------|------------------|-----------------|
|  | Number of Households (million) | Total Expenditures (dollars) | Space Heating | Water Heating | Appliances | Air Conditioning |                 |
|  |                                |                              | (dollars)     | (dollars)     | (dollars)  | (dollars)        |                 |
| <b>Total U.S. Households .....</b>         | 90.5                           | 1,080                        | 350           | 154           | 467        | 109              | 1.54            |
| <b>Census Region and Division</b>          |                                |                              |               |               |            |                  |                 |
| Northeast .....                            | 19.0                           | 1,276                        | 520           | 179           | 517        | 60               | 3.56            |
| New England .....                          | 4.3                            | 1,222                        | 518           | 194           | 480        | 30               | 4.73            |
| Middle Atlantic .....                      | 14.8                           | 1,292                        | 521           | 174           | 528        | 68               | 3.40            |
| Midwest .....                              | 22.3                           | 1,124                        | 427           | 136           | 469        | 93               | 3.09            |
| East North Central .....                   | 15.9                           | 1,149                        | 454           | 142           | 473        | 79               | 3.45            |
| West North Central .....                   | 6.4                            | 1,064                        | 360           | 120           | 456        | 128              | 3.85            |
| South .....                                | 30.9                           | 1,081                        | 377           | 162           | 456        | 186              | 2.95            |
| South Atlantic .....                       | 15.6                           | 1,128                        | 309           | 184           | 462        | 172              | 3.78            |
| East South Central .....                   | 6.1                            | 992                          | 291           | 156           | 392        | 152              | 4.31            |
| West South Central .....                   | 9.2                            | 1,060                        | 212           | 129           | 487        | 231              | 5.32            |
| West .....                                 | 18.3                           | 819                          | 203           | 135           | 434        | 48               | 3.51            |
| Mountain .....                             | 4.4                            | 944                          | 286           | 122           | 463        | 73               | 5.48            |
| Pacific .....                              | 13.9                           | 779                          | 176           | 139           | 424        | 40               | 3.54            |
| <b>Metropolitan Status</b>                 |                                |                              |               |               |            |                  |                 |
| Metropolitan .....                         | 70.2                           | 1,093                        | 351           | 150           | 477        | 115              | 1.75            |
| Central City .....                         | 29.6                           | 1,001                        | 340           | 137           | 423        | 101              | 2.93            |
| Outside Central City .....                 | 40.6                           | 1,160                        | 359           | 159           | 516        | 126              | 2.20            |
| Nonmetropolitan .....                      | 20.3                           | 1,035                        | 347           | 168           | 435        | 85               | 3.53            |
| <b>Climate Zone</b>                        |                                |                              |               |               |            |                  |                 |
| Under 2,000 HDD and--                      |                                |                              |               |               |            |                  |                 |
| Over 7,000 HDD .....                       | 8.5                            | 1,030                        | 427           | 160           | 412        | 30               | 5.33            |
| 5,500 to 7,000 HDD .....                   | 25.9                           | 1,156                        | 458           | 147           | 484        | 68               | 3.23            |
| 4,000 to 5,499 HDD .....                   | 21.9                           | 1,138                        | 415           | 146           | 464        | 103              | 4.02            |
| Under 4,000 HDD .....                      | 17.8                           | 931                          | 235           | 158           | 446        | 92               | 4.31            |
| 2,000 HDD or More and --                   |                                |                              |               |               |            |                  |                 |
| Under 4,000 HDD .....                      | 16.3                           | 1,068                        | 177           | 152           | 499        | 239              | 4.64            |
| <b>Housing Structure by Status of Unit</b> |                                |                              |               |               |            |                  |                 |
| Single-Family Detached .....               | 55.2                           | 1,226                        | 391           | 167           | 542        | 127              | 1.79            |
| Owned .....                                | 47.7                           | 1,257                        | 400           | 166           | 558        | 134              | 1.89            |
| Rented .....                               | 7.4                            | 1,027                        | 331           | 174           | 442        | 79               | 4.02            |
| Single-Family Attached .....               | 5.3                            | 1,135                        | 404           | 148           | 472        | 111              | 7.55            |
| Owned .....                                | 3.9                            | 1,180                        | 434           | 149           | 497        | 100              | 8.03            |
| Rented .....                               | 1.5                            | 1,017                        | 325           | 146           | 406        | 140              | 12.84           |
| Building of 2 to 4 Units .....             | 10.1                           | 905                          | 338           | 131           | 376        | 60               | 4.18            |
| Owned .....                                | 2.0                            | 1,159                        | 452           | 130           | 499        | 78               | 8.93            |
| Rented .....                               | 8.1                            | 842                          | 310           | 131           | 346        | 55               | 4.22            |
| Building of 5 or More Units .....          | 14.9                           | 681                          | 206           | 114           | 276        | 85               | 4.28            |
| Owned .....                                | 1.0                            | 848                          | 215           | 107           | 416        | 110              | 16.94           |
| Rented .....                               | 13.9                           | 669                          | 206           | 114           | 266        | 83               | 4.42            |
| Mobile Home .....                          | 5.1                            | 948                          | 297           | 180           | 397        | 74               | 5.20            |
| Owned .....                                | 4.3                            | 960                          | 298           | 178           | 408        | 77               | 5.86            |
| Rented .....                               | .9                             | 887                          | 296           | 189           | 342        | 61               | 10.20           |
| <b>Number of Rooms</b>                     |                                |                              |               |               |            |                  |                 |
| 1 .....                                    | .7                             | 546                          | 205           | 97            | 194        | 49               | 20.74           |
| 2 .....                                    | 2.4                            | 508                          | 178           | 96            | 199        | 35               | 8.84            |
| 3 .....                                    | 9.8                            | 659                          | 215           | 116           | 261        | 67               | 4.69            |
| 4 .....                                    | 17.7                           | 840                          | 270           | 140           | 354        | 77               | 2.86            |
| 5 .....                                    | 20.9                           | 1,028                        | 319           | 158           | 453        | 98               | 2.27            |
| 6 .....                                    | 17.4                           | 1,214                        | 381           | 165           | 536        | 132              | 2.44            |
| 7 .....                                    | 11.2                           | 1,374                        | 454           | 172           | 610        | 138              | 3.11            |
| 8 or More .....                            | 10.4                           | 1,614                        | 561           | 183           | 698        | 172              | 3.23            |

See footnotes at end of table.

## END-USE EXPENDITURES

**Table 23. Expenditures for Energy End Use per Household, 1987 (Continued)**

| Household Characteristics                              | Number of Households (million) | Total Expenditures (dollars) | End-Use Expenditures    |                         |                      |                            |      | RSE Row Factors |
|--|--------------------------------|------------------------------|-------------------------|-------------------------|----------------------|----------------------------|------|-----------------|
|  |                                |                              | Space Heating (dollars) | Water Heating (dollars) | Appliances (dollars) | Air Conditioning (dollars) |      |                 |
| RSE Column Factors:                                    | 1.343                          | 0.645                        | 1.005                   | 0.825                   | 0.718                | 1.939                      |      |                 |
| <b>Measured Heated Area of Residence (square feet)</b> |                                |                              |                         |                         |                      |                            |      |                 |
| Fewer than 600 .....                                   | 8.4                            | 675                          | 210                     | 130                     | 290                  | 46                         | 5.03 |                 |
| 600 to 999 .....                                       | 23.9                           | 825                          | 280                     | 138                     | 349                  | 78                         | 2.74 |                 |
| 1,000 to 1,599 .....                                   | 25.6                           | 1,046                        | 315                     | 159                     | 461                  | 112                        | 2.26 |                 |
| 1,600 to 1,999 .....                                   | 11.3                           | 1,288                        | 409                     | 157                     | 538                  | 134                        | 2.72 |                 |
| 2,000 to 2,399 .....                                   | 8.4                            | 1,358                        | 455                     | 168                     | 598                  | 137                        | 3.70 |                 |
| 2,400 to 2,999 .....                                   | 7.7                            | 1,448                        | 518                     | 171                     | 625                  | 133                        | 3.46 |                 |
| 3,000 or More .....                                    | 5.3                            | 1,724                        | 610                     | 186                     | 732                  | 197                        | 3.78 |                 |
| <b>Year of Construction</b>                            |                                |                              |                         |                         |                      |                            |      |                 |
| 1939 or Before .....                                   | 21.5                           | 1,105                        | 452                     | 152                     | 446                  | 55                         | 3.42 |                 |
| 1940 to 1949 .....                                     | 8.2                            | 1,042                        | 557                     | 152                     | 450                  | 62                         | 3.66 |                 |
| 1950 to 1959 .....                                     | 13.1                           | 1,121                        | 380                     | 152                     | 498                  | 111                        | 3.48 |                 |
| 1960 to 1969 .....                                     | 16.4                           | 1,060                        | 324                     | 145                     | 459                  | 133                        | 3.12 |                 |
| 1970 to 1974 .....                                     | 9.6                            | 1,062                        | 320                     | 154                     | 468                  | 120                        | 4.36 |                 |
| 1975 to 1979 .....                                     | 10.5                           | 1,131                        | 310                     | 158                     | 500                  | 163                        | 4.33 |                 |
| 1980 to 1984 .....                                     | 7.4                            | 984                          | 230                     | 162                     | 483                  | 130                        | 6.28 |                 |
| 1985 or After .....                                    | 3.9                            | 1,049                        | 258                     | 183                     | 472                  | 137                        | 6.24 |                 |
| <b>1987 Family Income</b>                              |                                |                              |                         |                         |                      |                            |      |                 |
| Less than \$5,000 .....                                | 6.2                            | 818                          | 312                     | 135                     | 316                  | 55                         | 5.49 |                 |
| \$5,000 to \$9,999 .....                               | 11.5                           | 881                          | 324                     | 139                     | 354                  | 63                         | 3.71 |                 |
| \$10,000 to \$14,999 .....                             | 12.6                           | 927                          | 319                     | 145                     | 388                  | 75                         | 3.19 |                 |
| \$15,000 to \$19,999 .....                             | 9.0                            | 967                          | 323                     | 148                     | 414                  | 83                         | 4.01 |                 |
| \$20,000 to \$24,999 .....                             | 8.8                            | 1,038                        | 380                     | 152                     | 452                  | 105                        | 3.40 |                 |
| \$25,000 to \$34,999 .....                             | 16.2                           | 1,091                        | 341                     | 153                     | 475                  | 121                        | 2.74 |                 |
| \$35,000 to \$49,999 .....                             | 13.4                           | 1,257                        | 374                     | 171                     | 570                  | 142                        | 2.87 |                 |
| \$50,000 or More .....                                 | 12.9                           | 1,440                        | 440                     | 171                     | 650                  | 179                        | 2.97 |                 |
| <b>Below 100 Percent of Poverty Line</b>               |                                |                              |                         |                         |                      |                            |      |                 |
| 11.8   | 904                            | 307                          | 161                     | 376                     | 60                   | 4.00                       |      |                 |
| <b>Below 125 Percent of Poverty Line</b>               |                                |                              |                         |                         |                      |                            |      |                 |
| 18.2   | 918                            | 314                          | 157                     | 383                     | 64                   | 3.28                       |      |                 |
| <b>Race of Householder</b>                             |                                |                              |                         |                         |                      |                            |      |                 |
| White .....  | 76.6                           | 1,087                        | 350                     | 151                     | 476                  | 111                        | 1.43 |                 |
| Black .....  | 10.9                           | 1,097                        | 383                     | 179                     | 430                  | 106                        | 4.50 |                 |
| Other .....  | 3.0                            | 882                          | 238                     | 141                     | 397                  | 56                         | 6.76 |                 |
| <b>Householder of Hispanic Descent</b>                 |                                |                              |                         |                         |                      |                            |      |                 |
| Yes .....  | 5.0                            | 977                          | 250                     | 160                     | 457                  | 111                        | 5.71 |                 |
| No .....   | 85.5                           | 1,086                        | 356                     | 153                     | 468                  | 108                        | 1.58 |                 |
| <b>Age of Householder</b>                              |                                |                              |                         |                         |                      |                            |      |                 |
| Under 25 Years .....                                   | 6.5                            | 836                          | 288                     | 144                     | 389                  | 86                         | 4.99 |                 |
| 25 to 34 Years .....                                   | 21.5                           | 1,016                        | 310                     | 159                     | 442                  | 104                        | 2.53 |                 |
| 35 to 44 Years .....                                   | 18.0                           | 1,180                        | 342                     | 173                     | 544                  | 121                        | 2.31 |                 |
| 45 to 59 Years .....                                   | 18.9                           | 1,235                        | 383                     | 163                     | 558                  | 131                        | 2.32 |                 |
| 60 Years and Over .....                                | 25.7                           | 1,010                        | 385                     | 131                     | 401                  | 93                         | 2.61 |                 |
| <b>Household Size</b>                                  |                                |                              |                         |                         |                      |                            |      |                 |
| 1 Person .....   | 21.6                           | 768                          | 322                     | 94                      | 289                  | 65                         | 2.85 |                 |
| 2 Persons .....  | 30.7                           | 1,040                        | 345                     | 140                     | 443                  | 111                        | 2.15 |                 |
| 3 Persons .....  | 15.4                           | 1,186                        | 361                     | 176                     | 525                  | 127                        | 2.35 |                 |
| 4 Persons .....  | 13.6                           | 1,324                        | 381                     | 200                     | 601                  | 143                        | 2.72 |                 |
| 5 Persons .....  | 6.1                            | 1,369                        | 358                     | 223                     | 662                  | 136                        | 3.55 |                 |
| 6 or More Persons .....                                | 3.1                            | 1,452                        | 389                     | 253                     | 715                  | 96                         | 6.05 |                 |

See footnotes at end of table.

**Table 23. Expenditures for Energy End Use per Household, 1987 (Continued)**

| Household Characteristics                  | Number of Households (million) | Total Expenditures (dollars) | End-Use Expenditures    |                         |                      |                            | RSE Row Factors |
|--|--------------------------------|------------------------------|-------------------------|-------------------------|----------------------|----------------------------|-----------------|
|  |                                |                              | Space Heating (dollars) | Water Heating (dollars) | Appliances (dollars) | Air Conditioning (dollars) |                 |
| RSE Column Factors:                        | 1.343                          | 0.645                        | 1.005                   | 0.625                   | 0.718                | 1.939                      |                 |
| <b>Main Heating Fuel</b>                   |                                |                              |                         |                         |                      |                            |                 |
| Natural Gas .....                          | 50.0                           | 1,073                        | 366                     | 127                     | 470                  | 110                        | 2.06            |
| Electricity .....                          | 17.9                           | 1,038                        | 290                     | 171                     | 417                  | 160                        | 3.96            |
| Fuel Oil or Kerosene .....                 | 12.2                           | 1,260                        | 479                     | 206                     | 515                  | 60                         | 3.92            |
| LPG .....                                  | 4.1                            | 1,163                        | 430                     | 180                     | 462                  | 90                         | 6.21            |
| <b>Secondary Heating</b>                   |                                |                              |                         |                         |                      |                            |                 |
| Yes .....                                  | 37.4                           | 1,195                        | 374                     | 168                     | 530                  | 123                        | 2.09            |
| Over 33 Percent of Home's Total Heat ..... | 3.2                            | 1,127                        | 301                     | 194                     | 542                  | 91                         | 6.70            |
| No .....                                   | 53.2                           | 999                          | 333                     | 144                     | 423                  | 98                         | 1.77            |

Notes: • End-use values are statistical estimates based on the 1987 RECS. • See Appendix B for methodology of end-use estimates. • Electricity consumption is based on site electricity. No adjustment is made for primary fuels consumed to produce electricity. • Energy expenditures include natural gas, electricity, fuel oil, kerosene and LPG. • To obtain a Relative Standard Error (RSE) percentage for any table cell, multiply the cell's corresponding column and row factors. • Because of rounding, data may not sum to totals. • See "Glossary" for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use Division, Forms EIA-457 A, B, C, D, E, F, G of the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).

**Table 24. Natural Gas Consumption and Expenditures by End Use per Household, 1987**

| Household Characteristics                              | Number of Households (million) | All End Uses              |                        | Space Heating             |                        | Water Heating             |                        | Appliances                |                        | RSE Row Factors |
|--|--------------------------------|---------------------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|-----------------|
|  |                                | Consumption (million Btu) | Expenditures (dollars) |                 |
|  |                                | RSE Column Factors:       | 1.309                  | 0.799                     | 0.834                  | 0.982                     | 1.003                  | 0.742                     | 0.845                  | 1.305           |
| <b>Total U.S. Households Using Natural Gas</b>         | 57.3                           | 84.3                      | 456                    | 59.0                      | 315                    | 19.2                      | 105                    | 5.9                       | 35                     | 2.47            |
| <b>Census Region and Division</b>                      |                                |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Northeast  | 11.7                           | 88.5                      | 571                    | 62.8                      | 391                    | 18.4                      | 122                    | 7.3                       | 58                     | 7.04            |
| New England  | 1.7                            | 86.8                      | 586                    | 60.0                      | 396                    | 20.3                      | 141                    | 6.6                       | 49                     | 7.43            |
| Middle Atlantic  | 10.0                           | 88.8                      | 568                    | 63.3                      | 391                    | 18.1                      | 119                    | 7.4                       | 59                     | 8.19            |
| Midwest  | 17.1                           | 106.8                     | 526                    | 82.4                      | 405                    | 19.2                      | 95                     | 5.1                       | 25                     | 3.22            |
| East North Central                                     | 12.2                           | 110.5                     | 553                    | 85.2                      | 427                    | 19.8                      | 100                    | 5.4                       | 27                     | 4.19            |
| West North Central                                     | 4.9                            | 97.5                      | 457                    | 75.2                      | 352                    | 17.8                      | 84                     | 4.5                       | 21                     | 4.50            |
| South  | 15.1                           | 72.3                      | 400                    | 49.1                      | 273                    | 17.5                      | 96                     | 5.1                       | 29                     | 5.91            |
| South Atlantic   | 5.9                            | 77.0                      | 501                    | 56.4                      | 365                    | 16.4                      | 108                    | 4.2                       | 28                     | 8.50            |
| East South Central                                     | 2.5                            | 76.1                      | 374                    | 55.8                      | 274                    | 15.6                      | 77                     | 4.6                       | 24                     | 13.74           |
| West South Central                                     | 6.8                            | 66.9                      | 322                    | 40.4                      | 193                    | 19.2                      | 93                     | 6.2                       | 31                     | 8.02            |
| West   | 13.4                           | 65.5                      | 331                    | 37.0                      | 180                    | 21.7                      | 113                    | 6.4                       | 36                     | 3.34            |
| Mountain   | 3.5                            | 90.2                      | 410                    | 63.9                      | 283                    | 21.0                      | 99                     | 4.4                       | 23                     | 5.75            |
| Pacific  | 9.9                            | 56.8                      | 303                    | 27.6                      | 144                    | 22.0                      | 118                    | 7.1                       | 41                     | 3.90            |
| <b>Metropolitan Status</b>                             |                                |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Metropolitan   | 48.7                           | 83.6                      | 457                    | 57.4                      | 310                    | 19.7                      | 109                    | 6.2                       | 38                     | 2.70            |
| Central City   | 23.3                           | 81.9                      | 449                    | 56.2                      | 302                    | 19.0                      | 105                    | 6.3                       | 40                     | 3.53            |
| Outside Central City                                   | 25.4                           | 85.1                      | 465                    | 58.6                      | 317                    | 20.4                      | 113                    | 6.1                       | 36                     | 3.18            |
| Nonmetropolitan  | 8.6                            | 88.3                      | 450                    | 68.0                      | 345                    | 16.2                      | 83                     | 4.1                       | 22                     | 5.78            |
| <b>Climate Zone</b>                                    |                                |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Under 2,000 CDD and--                                  |                                |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Over 7,000 HDD   | 4.2                            | 100.1                     | 503                    | 80.7                      | 405                    | 16.2                      | 81                     | 3.2                       | 17                     | 5.23            |
| 5,500 to 7,000 HDD                                     | 19.1                           | 109.5                     | 555                    | 82.8                      | 416                    | 20.7                      | 107                    | 5.8                       | 31                     | 3.38            |
| 4,000 to 5,499 HDD                                     | 13.1                           | 83.1                      | 505                    | 58.7                      | 348                    | 17.9                      | 109                    | 6.5                       | 48                     | 6.85            |
| Under 4,000 HDD  | 12.2                           | 59.7                      | 336                    | 32.9                      | 187                    | 20.5                      | 112                    | 6.3                       | 36                     | 5.02            |
| 2,000 CDD or More and --                               |                                |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Under 4,000 HDD  | 8.8                            | 58.1                      | 315                    | 33.9                      | 182                    | 17.5                      | 97                     | 5.8                       | 33                     | 7.85            |
| <b>Housing Structure by Status of Unit</b>             |                                |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Single-Family Detached                                 | 33.6                           | 98.2                      | 521                    | 70.1                      | 369                    | 21.4                      | 115                    | 6.6                       | 37                     | 2.57            |
| Owned  | 28.9                           | 99.2                      | 527                    | 71.3                      | 376                    | 21.1                      | 113                    | 6.6                       | 37                     | 2.75            |
| Rented   | 4.7                            | 92.2                      | 484                    | 62.5                      | 325                    | 23.2                      | 122                    | 6.4                       | 35                     | 4.87            |
| Single-Family Attached                                 | 3.5                            | 82.8                      | 495                    | 58.3                      | 342                    | 18.6                      | 114                    | 5.9                       | 39                     | 9.56            |
| Owned  | 2.6                            | 87.2                      | 531                    | 62.0                      | 369                    | 19.0                      | 119                    | 6.2                       | 43                     | 10.23           |
| Rented   | .9                             | 69.9                      | 390                    | 47.4                      | 263                    | 17.5                      | 98                     | 5.0                       | 29                     | 17.13           |
| Building of 2 to 4 Units                               | 8.0                            | 76.4                      | 431                    | 52.4                      | 288                    | 17.9                      | 103                    | 5.9                       | 40                     | 4.38            |
| Owned  | 1.7                            | 89.8                      | 515                    | 65.1                      | 359                    | 17.5                      | 105                    | 7.2                       | 50                     | 8.99            |
| Rented   | 6.3                            | 72.8                      | 409                    | 49.1                      | 269                    | 18.0                      | 103                    | 5.6                       | 37                     | 4.64            |
| Building of 5 or More Units                            | 10.5                           | 48.5                      | 269                    | 30.2                      | 162                    | 14.2                      | 79                     | 3.5                       | 25                     | 8.83            |
| Owned  | .6                             | 48.6                      | 269                    | 30.3                      | Q                      | 14.0                      | 83                     | 4.3                       | 29                     | 32.25           |
| Rented   | 9.8                            | 48.5                      | 269                    | 30.1                      | 163                    | 14.2                      | 78                     | 3.4                       | 25                     | 8.85            |
| Mobile Home  | 1.7                            | 71.1                      | 369                    | 50.5                      | 262                    | 14.3                      | 72                     | 6.2                       | 35                     | 9.71            |
| Owned  | 1.4                            | 72.1                      | 372                    | 51.0                      | 262                    | 14.7                      | 74                     | 6.4                       | 36                     | 10.89           |
| Rented   | .3                             | 65.8                      | 354                    | 48.1                      | 261                    | 12.5                      | 64                     | 5.2                       | 29                     | 13.37           |
| <b>Measured Heated Area of Residence (square feet)</b> |                                |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Fewer than 600   | 5.3                            | 48.8                      | 273                    | 29.1                      | 158                    | 15.4                      | 85                     | 4.2                       | 30                     | 6.86            |
| 600 to 999   | 15.4                           | 65.4                      | 355                    | 43.5                      | 232                    | 16.7                      | 91                     | 4.9                       | 30                     | 4.03            |
| 1,000 to 1,599   | 14.9                           | 78.5                      | 423                    | 53.8                      | 287                    | 18.9                      | 103                    | 5.6                       | 33                     | 3.12            |
| 1,600 to 1,999   | 7.2                            | 95.7                      | 524                    | 69.0                      | 373                    | 20.0                      | 112                    | 6.6                       | 39                     | 4.28            |
| 2,000 to 2,399   | 5.9                            | 106.0                     | 574                    | 76.0                      | 408                    | 22.9                      | 125                    | 7.1                       | 42                     | 4.60            |
| 2,400 to 2,999   | 5.3                            | 121.2                     | 652                    | 90.0                      | 481                    | 22.7                      | 124                    | 7.8                       | 44                     | 5.34            |
| 3,000 or More  | 3.3                            | 132.3                     | 700                    | 100.7                     | 522                    | 24.0                      | 133                    | 7.4                       | 44                     | 5.45            |

See footnotes at end of table.

**Table 24. Natural Gas Consumption and Expenditures by End Use per Household, 1987 (Continued)**

| Household Characteristics                | Number of Households (million) | All End Uses                |                         | Space Heating               |                         | Water Heating               |                         | Appliances                  |                         | RSE Row Factors |
|--|--------------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|-----------------------------|-------------------------|-----------------|
|  |                                | Con-sump-tion (million Btu) | Expend-itures (dollars) |                 |
| RSE Column Factors:                      | 1.309                          | 0.799                       | 0.834                   | 0.982                       | 1.003                   | 0.742                       | 0.845                   | 1.305                       | 1.424                   | RSE Row Factors |
| <b>Year of Construction</b>              |                                |                             |                         |                             |                         |                             |                         |                             |                         |                 |
| 1939 or Before .....                     | 15.7                           | 97.4                        | 539                     | 72.6                        | 391                     | 18.7                        | 107                     | 6.1                         | 41                      | 4.44            |
| 1940 to 1949 .....                       | 6.0                            | 80.1                        | 449                     | 56.1                        | 310                     | 17.4                        | 98                      | 6.6                         | 41                      | 4.67            |
| 1950 to 1959 .....                       | 9.1                            | 86.1                        | 459                     | 59.0                        | 311                     | 20.3                        | 109                     | 6.3                         | 36                      | 3.79            |
| 1960 to 1969 .....                       | 11.9                           | 77.7                        | 427                     | 52.5                        | 287                     | 18.9                        | 105                     | 5.7                         | 32                      | 4.58            |
| 1970 to 1974 .....                       | 5.8                            | 83.7                        | 433                     | 57.0                        | 292                     | 20.8                        | 109                     | 5.8                         | 32                      | 6.37            |
| 1975 to 1979 .....                       | 4.7                            | 72.2                        | 361                     | 49.1                        | 244                     | 18.7                        | 94                      | 4.5                         | 23                      | 9.29            |
| 1980 to 1984 .....                       | 3.0                            | 65.5                        | 350                     | 42.4                        | 224                     | 18.9                        | 101                     | 4.3                         | 25                      | 11.80           |
| 1985 or After .....                      | 1.2                            | 82.0                        | 430                     | 50.7                        | 262                     | 23.9                        | 127                     | 7.5                         | 41                      | 12.26           |
| <b>1987 Family Income</b>                |                                |                             |                         |                             |                         |                             |                         |                             |                         |                 |
| Less than \$5,000 .....                  | 3.8                            | 78.0                        | 421                     | 56.0                        | 300                     | 17.4                        | 94                      | 4.6                         | 27                      | 7.01            |
| \$5,000 to \$9,999 .....                 | 7.4                            | 77.5                        | 413                     | 55.0                        | 287                     | 17.0                        | 91                      | 5.2                         | 32                      | 4.49            |
| \$10,000 to \$14,999 .....               | 8.0                            | 77.4                        | 416                     | 54.7                        | 289                     | 17.2                        | 94                      | 5.3                         | 33                      | 4.44            |
| \$15,000 to \$19,999 .....               | 5.6                            | 78.8                        | 426                     | 55.5                        | 295                     | 17.4                        | 95                      | 5.4                         | 33                      | 5.06            |
| \$20,000 to \$24,999 .....               | 5.3                            | 79.3                        | 416                     | 55.8                        | 290                     | 17.8                        | 93                      | 5.7                         | 32                      | 4.26            |
| \$25,000 to \$34,999 .....               | 9.9                            | 81.7                        | 446                     | 57.2                        | 308                     | 19.0                        | 105                     | 5.5                         | 33                      | 4.27            |
| \$35,000 to \$49,999 .....               | 8.3                            | 93.7                        | 509                     | 65.2                        | 351                     | 22.0                        | 121                     | 6.3                         | 37                      | 4.47            |
| \$50,000 or More .....                   | 9.0                            | 99.3                        | 547                     | 67.8                        | 369                     | 23.1                        | 130                     | 7.9                         | 47                      | 4.53            |
| <b>Below 100 Percent of Poverty Line</b> |                                |                             |                         |                             |                         |                             |                         |                             |                         |                 |
| Below 100 Percent of Poverty Line .....  | 7.4                            | 80.8                        | 438                     | 53.9                        | 288                     | 20.4                        | 112                     | 6.3                         | 38                      | 5.00            |
| <b>Below 125 Percent of Poverty Line</b> |                                |                             |                         |                             |                         |                             |                         |                             |                         |                 |
| Below 125 Percent of Poverty Line .....  | 11.5                           | 80.6                        | 435                     | 55.2                        | 293                     | 19.5                        | 106                     | 5.8                         | 35                      | 4.18            |
| <b>Race of Householder</b>               |                                |                             |                         |                             |                         |                             |                         |                             |                         |                 |
| White .....                              | 46.6                           | 84.7                        | 452                     | 60.2                        | 317                     | 18.7                        | 101                     | 5.6                         | 33                      | 2.71            |
| Black .....                              | 8.5                            | 87.5                        | 514                     | 58.0                        | 334                     | 21.8                        | 129                     | 7.6                         | 50                      | 4.65            |
| Other .....                              | 2.2                            | 62.8                        | 332                     | 37.4                        | 190                     | 19.1                        | 103                     | 6.0                         | 37                      | 8.88            |
| <b>Householder of Hispanic Descent</b>   |                                |                             |                         |                             |                         |                             |                         |                             |                         |                 |
| Yes .....                                | 3.7                            | 62.5                        | 341                     | 36.3                        | 192                     | 19.7                        | 108                     | 6.4                         | 41                      | 6.13            |
| No .....                                 | 53.6                           | 85.8                        | 464                     | 60.6                        | 323                     | 19.2                        | 105                     | 5.8                         | 35                      | 2.58            |
| <b>Age of Householder</b>                |                                |                             |                         |                             |                         |                             |                         |                             |                         |                 |
| Under 25 Years .....                     | 4.1                            | 67.4                        | 360                     | 44.4                        | 235                     | 18.0                        | 97                      | 4.4                         | 25                      | 7.11            |
| 25 to 34 Years .....                     | 13.9                           | 79.5                        | 429                     | 53.3                        | 283                     | 20.1                        | 109                     | 5.9                         | 36                      | 3.96            |
| 35 to 44 Years .....                     | 10.7                           | 89.4                        | 476                     | 59.8                        | 314                     | 22.8                        | 122                     | 6.8                         | 40                      | 3.39            |
| 45 to 59 Years .....                     | 11.7                           | 94.6                        | 512                     | 66.3                        | 353                     | 21.0                        | 116                     | 7.0                         | 41                      | 3.18            |
| 60 Years and Over .....                  | 16.8                           | 82.0                        | 452                     | 61.8                        | 335                     | 15.2                        | 85                      | 4.8                         | 30                      | 3.94            |
| <b>Household Size</b>                    |                                |                             |                         |                             |                         |                             |                         |                             |                         |                 |
| 1 Person .....                           | 14.3                           | 69.1                        | 368                     | 53.6                        | 282                     | 12.2                        | 65                      | 3.0                         | 19                      | 4.86            |
| 2 Persons .....                          | 18.7                           | 80.5                        | 435                     | 58.6                        | 312                     | 16.8                        | 91                      | 5.1                         | 31                      | 3.05            |
| 3 Persons .....                          | 9.7                            | 87.9                        | 479                     | 59.3                        | 318                     | 21.5                        | 118                     | 7.1                         | 42                      | 3.27            |
| 4 Persons .....                          | 8.5                            | 100.6                       | 543                     | 66.1                        | 353                     | 26.0                        | 142                     | 8.0                         | 46                      | 4.17            |
| 5 Persons .....                          | 4.1                            | 100.9                       | 560                     | 62.4                        | 340                     | 28.2                        | 158                     | 9.9                         | 60                      | 5.25            |
| 6 or More Persons .....                  | 2.0                            | 107.6                       | 597                     | 63.7                        | 345                     | 33.5                        | 190                     | 9.8                         | 59                      | 6.74            |
| <b>All Gas Paid by Household</b>         |                                |                             |                         |                             |                         |                             |                         |                             |                         |                 |
| Yes .....                                | 44.3                           | 91.1                        | 490                     | 64.6                        | 343                     | 20.0                        | 108                     | 6.3                         | 38                      | 2.76            |
| Budget Plan .....                        | 7.6                            | 119.7                       | 652                     | 90.7                        | 493                     | 22.8                        | 125                     | 6.2                         | 34                      | 3.82            |
| No Budget Plan .....                     | 36.6                           | 85.1                        | 456                     | 59.2                        | 312                     | 19.4                        | 105                     | 6.3                         | 38                      | 2.91            |
| No .....                                 | 13.1                           | 61.4                        | 343                     | 40.0                        | 219                     | 16.4                        | 94                      | 4.3                         | 27                      | 5.49            |

See footnotes at end of table.

**Table 24. Natural Gas Consumption and Expenditures by End Use per Household, 1987 (Continued)**

| Household Characteristics                  | Number of Households (million) | All End Uses                              |                                | Space Heating                             |                                | Water Heating                             |                                | Appliances                                |                                | RSE Row Factors |
|--|--------------------------------|---|--------------------------------|---|--------------------------------|---|--------------------------------|---|--------------------------------|-----------------|
|  |                                | Con-<br>sump-<br>tion<br>(million<br>Btu) | Expend-<br>itures<br>(dollars) | Con-<br>sump-<br>tion<br>(million<br>Btu) | Expend-<br>itures<br>(dollars) | Con-<br>sump-<br>tion<br>(million<br>Btu) | Expend-<br>itures<br>(dollars) | Con-<br>sump-<br>tion<br>(million<br>Btu) | Expend-<br>itures<br>(dollars) |                 |
| RSE Column Factors:                        | 1.309                          | 0.799                                     | 0.834                          | 0.982                                     | 1.003                          | 0.742                                     | 0.845                          | 1.305                                     | 1.424                          |                 |
| <b>Secondary Heating</b>                   |                                |   |                                |   |                                |   |                                |   |                                |                 |
| Yes .....                                  | 20.9                           | 90.4                                      | 481                            | 63.4                                      | 335                            | 20.5                                      | 110                            | 6.2                                       | 36                             | 3.27            |
| Over 33 Percent of Home's Total Heat ..... | 1.2                            | 72.6                                      | 380                            | 42.2                                      | 216                            | 23.4                                      | 124                            | 7.1                                       | 40                             | 8.28            |
| No .....                                   | 36.4                           | 80.8                                      | 442                            | 56.5                                      | 303                            | 18.4                                      | 102                            | 5.7                                       | 35                             | 3.02            |

a Data withheld either because the RSE was greater than 50 percent or fewer than 10 households were sampled.

Notes: • End-use values are statistical estimates based on the 1987 RECS. • See Appendix B for methodology of end-use estimates. • To obtain a Relative Standard Error (RSE) percentage for any table cell, multiply the cell's corresponding column and row factors. • Because the small amount of natural gas that is used for air conditioning is omitted and because of rounding, data may not sum to totals. • See "Glossary" for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use Division, Forms EIA-457 A, B, C, F of the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).

**Table 25. Electricity Consumption and Expenditures by End Use per Household, 1987**

| Household Characteristics                              | Number of Households (million) | All End Uses              |                        | Space Heating             |                        | Water Heating             |                        | Appliances                |                        | Air Conditioning          |                        | RSE Row Factors |
|--|--------------------------------|---------------------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|-----------------|
|  |                                | Consumption (million Btu) | Expenditures (dollars) |                 |
|  |                                | RSE Column Factors:       | 0.835                  | 0.610                     | 0.564                  | 2.371                     | 2.295                  | 1.463                     | 1.473                  | 0.443                     | 0.456                  | 1.214           |
| <b>Total U.S. Households Using Electricity</b>         | 90.5                           | 30.5                      | 680                    | 3.1                       | 61                     | 3.5                       | 71                     | 19.0                      | 440                    | 4.8                       | 108                    | 2.54            |
| <b>Census Region and Division</b>                      |                                |                           |                        |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Northeast  | 19.0                           | 23.3                      | 648                    | 2.5                       | 59                     | 2.2                       | 54                     | 16.6                      | 475                    | 2.0                       | 60                     | 5.43            |
| New England  | 4.3                            | 22.9                      | 600                    | 2.3                       | 54                     | 2.6                       | 66                     | 16.9                      | 451                    | 1.2                       | 30                     | 9.66            |
| Middle Atlantic  | 14.8                           | 23.4                      | 661                    | 2.6                       | 60                     | 2.1                       | 50                     | 16.5                      | 483                    | 2.3                       | 68                     | 5.57            |
| Midwest  | 22.3                           | 27.4                      | 633                    | 2.0                       | 39                     | 2.7                       | 55                     | 18.8                      | 446                    | 3.9                       | 93                     | 6.28            |
| East North Central                                     | 15.9                           | 26.4                      | 628                    | 2.1                       | 41                     | 2.9                       | 59                     | 18.4                      | 450                    | 3.1                       | 79                     | 7.55            |
| West North Central                                     | 6.4                            | 29.8                      | 644                    | 1.8                       | 33                     | 2.3                       | 47                     | 19.9                      | 436                    | 5.8                       | 128                    | 5.95            |
| South  | 30.9                           | 39.5                      | 813                    | 4.4                       | 84                     | 5.3                       | 108                    | 20.9                      | 435                    | 8.9                       | 185                    | 4.01            |
| South Atlantic   | 15.6                           | 38.9                      | 840                    | 4.4                       | 90                     | 6.3                       | 136                    | 20.4                      | 442                    | 7.9                       | 172                    | 5.53            |
| East South Central                                     | 6.1                            | 43.7                      | 765                    | 6.8                       | 114                    | 6.9                       | 120                    | 21.4                      | 378                    | 8.7                       | 152                    | 5.57            |
| West South Central                                     | 9.2                            | 37.5                      | 800                    | 2.7                       | 55                     | 2.6                       | 55                     | 21.4                      | 462                    | 10.8                      | 228                    | 8.83            |
| West   | 18.3                           | 26.4                      | 548                    | 3.0                       | 51                     | 2.7                       | 46                     | 18.7                      | 404                    | 2.0                       | 46                     | 5.42            |
| Mountain   | 4.4                            | 27.8                      | 591                    | 2.1                       | 40                     | 2.1                       | 40                     | 20.6                      | 442                    | 2.9                       | 69                     | 9.69            |
| Pacific  | 13.9                           | 26.0                      | 534                    | 3.3                       | 55                     | 2.8                       | 48                     | 18.1                      | 392                    | 1.7                       | 39                     | 5.80            |
| <b>Metropolitan Status</b>                             |                                |                           |                        |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Metropolitan   | 70.2                           | 29.4                      | 678                    | 2.9                       | 58                     | 2.8                       | 58                     | 18.7                      | 447                    | 5.0                       | 115                    | 2.89            |
| Central City   | 29.6                           | 24.9                      | 578                    | 2.3                       | 46                     | 2.1                       | 43                     | 16.0                      | 391                    | 4.4                       | 99                     | 4.45            |
| Outside Central City                                   | 40.6                           | 32.7                      | 750                    | 3.3                       | 67                     | 3.3                       | 70                     | 20.7                      | 488                    | 5.5                       | 126                    | 3.53            |
| Nonmetropolitan  | 20.3                           | 34.0                      | 690                    | 4.0                       | 71                     | 5.8                       | 116                    | 20.1                      | 417                    | 4.2                       | 85                     | 5.29            |
| <b>Climate Zone</b>                                    |                                |                           |                        |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Under 2,000 CDD and--                                  |                                |                           |                        |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Over 7,000 HDD   | 8.5                            | 27.2                      | 564                    | 2.2                       | 44                     | 4.7                       | 96                     | 18.9                      | 394                    | 1.5                       | 30                     | 7.20            |
| 5,500 to 7,000 HDD                                     | 25.9                           | 26.5                      | 629                    | 2.9                       | 54                     | 2.5                       | 50                     | 18.5                      | 457                    | 2.7                       | 67                     | 6.76            |
| 4,000 to 5,499 HDD                                     | 21.9                           | 30.6                      | 678                    | 4.0                       | 76                     | 3.5                       | 67                     | 18.5                      | 432                    | 4.5                       | 103                    | 5.74            |
| Under 4,000 HDD  | 17.8                           | 29.4                      | 642                    | 3.1                       | 62                     | 3.6                       | 74                     | 18.4                      | 414                    | 4.3                       | 92                     | 6.33            |
| 2,000 CDD or More and --                               |                                |                           |                        |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Under 4,000 HDD  | 16.3                           | 39.5                      | 868                    | 2.9                       | 60                     | 4.2                       | 94                     | 21.4                      | 476                    | 11.0                      | 238                    | 5.70            |
| <b>Housing Structure by Status of Unit</b>             |                                |                           |                        |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Single-Family Detached                                 | 55.1                           | 35.7                      | 782                    | 3.3                       | 63                     | 3.9                       | 79                     | 22.8                      | 514                    | 5.7                       | 127                    | 3.01            |
| Owned  | 47.7                           | 36.8                      | 808                    | 3.4                       | 66                     | 3.9                       | 79                     | 23.4                      | 529                    | 6.1                       | 134                    | 3.23            |
| Rented   | 7.4                            | 28.5                      | 619                    | 2.4                       | 43                     | 4.1                       | 83                     | 18.5                      | 414                    | 3.5                       | 78                     | 6.10            |
| Single-Family Attached                                 | 5.3                            | 30.2                      | 718                    | 4.8                       | 97                     | 3.1                       | 65                     | 17.6                      | 446                    | 4.6                       | 111                    | 12.37           |
| Owned  | 3.9                            | 28.9                      | 714                    | 4.3                       | 90                     | 2.8                       | 57                     | 17.9                      | 467                    | 4.0                       | 100                    | 13.73           |
| Rented   | 1.5                            | 33.6                      | 731                    | 6.3                       | 119                    | 4.1                       | 84                     | 16.9                      | 388                    | 6.3                       | 140                    | 18.05           |
| Building of 2 to 4 Units                               | 10.1                           | 19.6                      | 483                    | 2.2                       | 43                     | 1.8                       | 36                     | 13.1                      | 344                    | 2.4                       | 59                     | 8.59            |
| Owned  | 2.0                            | 21.0                      | 577                    | Q                         | Q                      | 1.1                       | 22                     | 16.4                      | 457                    | 2.6                       | 78                     | 16.07           |
| Rented   | 8.1                            | 19.2                      | 459                    | 2.5                       | 48                     | 2.0                       | 40                     | 12.4                      | 317                    | 2.4                       | 55                     | 9.36            |
| Building of 5 or More Units                            | 14.9                           | 18.5                      | 436                    | 2.4                       | 52                     | 2.0                       | 43                     | 10.4                      | 258                    | 3.6                       | 83                     | 7.53            |
| Owned  | 1.0                            | 23.6                      | 616                    | 3.0                       | 71                     | 1.6                       | 38                     | 14.9                      | 397                    | 4.0                       | 110                    | 21.84           |
| Rented   | 13.9                           | 18.1                      | 424                    | 2.4                       | 51                     | 2.0                       | 43                     | 10.1                      | 248                    | 3.5                       | 81                     | 7.75            |
| Mobile Home  | 5.1                            | 30.6                      | 641                    | 3.6                       | 67                     | 6.8                       | 143                    | 16.8                      | 358                    | 3.4                       | 74                     | 7.59            |
| Owned  | 4.3                            | 31.9                      | 661                    | 4.0                       | 73                     | 6.8                       | 141                    | 17.5                      | 370                    | 3.6                       | 77                     | 8.30            |
| Rented   | .9                             | 24.5                      | 544                    | 1.5                       | 34                     | 6.8                       | 150                    | 13.5                      | 298                    | 2.8                       | 61                     | 13.95           |
| <b>Measured Heated Area of Residence (square feet)</b> |                                |                           |                        |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Fewer than 600   | 8.4                            | 16.5                      | 403                    | 1.9                       | 40                     | 2.5                       | 56                     | 10.2                      | 262                    | 1.9                       | 45                     | 8.01            |
| 600 to 999   | 23.9                           | 22.9                      | 515                    | 2.5                       | 49                     | 3.2                       | 67                     | 13.8                      | 323                    | 3.4                       | 77                     | 4.32            |
| 1,000 to 1,599   | 25.6                           | 32.3                      | 701                    | 3.6                       | 68                     | 4.2                       | 84                     | 19.5                      | 438                    | 5.1                       | 111                    | 3.71            |
| 1,600 to 1,999   | 11.2                           | 35.5                      | 791                    | 3.8                       | 75                     | 3.6                       | 72                     | 22.0                      | 510                    | 6.0                       | 134                    | 4.71            |
| 2,000 to 2,399   | 8.4                            | 36.7                      | 831                    | 3.3                       | 66                     | 3.1                       | 64                     | 24.4                      | 563                    | 6.0                       | 137                    | 6.34            |
| 2,400 to 2,999   | 7.7                            | 37.6                      | 851                    | 3.2                       | 62                     | 3.2                       | 66                     | 25.3                      | 591                    | 5.8                       | 132                    | 6.16            |
| 3,000 or More  | 5.3                            | 46.8                      | 1,049                  | 4.0                       | 79                     | 3.7                       | 73                     | 30.5                      | 700                    | 8.7                       | 196                    | 6.68            |

See footnotes at end of table.

## END-USE /ELECTRICITY

**Table 25. Electricity Consumption and Expenditures by End Use per Household,  
1987 (Continued)**

| Household Characteristics                | All End Uses                   |                           | Space Heating             |                        | Water Heating             |                        | Appliances                |                        | Air Conditioning          |                        | RSE<br>Row<br>Factors. |
|--|--------------------------------|---------------------------|---------------------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|------------------------|
|  | Number of Households (million) | Consumption (million Btu) | Consumption (million Btu) | Expenditures (dollars) |                        |
| <b>RSE Column Factors:</b>               |                                |                           |                           |                        |                           |                        |                           |                        |                           |                        |                        |
| 0.895                                    | 0.610                          | 0.564                     | 2.371                     | 2.295                  | 1.463                     | 1.473                  | 0.443                     | 0.456                  | 1.214                     | 1.210                  |                        |
| <b>Year of Construction</b>              |                                |                           |                           |                        |                           |                        |                           |                        |                           |                        |                        |
| 1939 or Before .....                     | 21.5                           | 22.5                      | 545                       | 1.2                    | 25                        | 2.5                    | 54                        | 16.5                   | 412                       | 2.3                    | 55                     |
| 1940 to 1949 .....                       | 8.2                            | 26.2                      | 592                       | 1.5                    | 30                        | 3.1                    | 63                        | 17.8                   | 418                       | 3.8                    | 82                     |
| 1950 to 1959 .....                       | 13.1                           | 29.0                      | 666                       | 1.7                    | 32                        | 2.7                    | 55                        | 19.9                   | 470                       | 4.8                    | 110                    |
| 1960 to 1969 .....                       | 16.4                           | 30.2                      | 670                       | 2.8                    | 52                        | 2.7                    | 55                        | 18.8                   | 432                       | 5.9                    | 130                    |
| 1970 to 1974 .....                       | 9.6                            | 32.6                      | 709                       | 3.9                    | 75                        | 3.8                    | 77                        | 19.4                   | 438                       | 5.4                    | 120                    |
| 1975 to 1979 .....                       | 10.5                           | 41.7                      | 885                       | 7.1                    | 137                       | 5.1                    | 102                       | 22.2                   | 482                       | 7.4                    | 163                    |
| 1980 to 1984 .....                       | 7.4                            | 37.9                      | 793                       | 5.4                    | 106                       | 5.4                    | 110                       | 21.1                   | 448                       | 6.0                    | 130                    |
| 1985 or After .....                      | 3.9                            | 39.9                      | 868                       | 6.6                    | 139                       | 6.4                    | 137                       | 20.8                   | 455                       | 6.1                    | 137                    |
| <b>1987 Family Income</b>                |                                |                           |                           |                        |                           |                        |                           |                        |                           |                        |                        |
| Less than \$5,000 .....                  | 6.2                            | 20.2                      | 457                       | 2.5                    | 48                        | 2.8                    | 61                        | 12.4                   | 294                       | 2.5                    | 55                     |
| \$5,000 to \$9,999 .....                 | 11.5                           | 22.7                      | 502                       | 2.5                    | 48                        | 3.2                    | 66                        | 14.1                   | 326                       | 2.8                    | 62                     |
| \$10,000 to \$14,999 .....               | 12.6                           | 548                       | 2.1                       | 40                     | 3.4                       | 72                     | 72                        | 15.6                   | 362                       | 3.3                    | 74                     |
| \$15,000 to \$19,999 .....               | 9.0                            | 26.5                      | 589                       | 2.6                    | 52                        | 3.5                    | 72                        | 16.7                   | 384                       | 3.7                    | 81                     |
| \$20,000 to \$24,999 .....               | 8.8                            | 30.9                      | 675                       | 3.4                    | 62                        | 4.1                    | 81                        | 18.7                   | 428                       | 4.7                    | 105                    |
| \$25,000 to \$34,999 .....               | 16.2                           | 32.2                      | 711                       | 3.3                    | 66                        | 3.6                    | 73                        | 19.8                   | 451                       | 5.5                    | 121                    |
| \$35,000 to \$49,999 .....               | 13.4                           | 38.0                      | 842                       | 3.8                    | 75                        | 3.9                    | 79                        | 23.9                   | 546                       | 6.4                    | 142                    |
| \$50,000 or More .....                   | 12.9                           | 40.5                      | 937                       | 4.1                    | 84                        | 3.0                    | 63                        | 25.8                   | 612                       | 7.6                    | 177                    |
| <b>Below 100 Percent of Poverty Line</b> |                                |                           |                           |                        |                           |                        |                           |                        |                           |                        |                        |
| 11.8                                     | 23.6                           | 527                       | 2.6                       | 49                     | 3.5                       | 72                     | 14.8                      | 345                    | 2.7                       | 60                     | 6.20                   |
| <b>Below 125 Percent of Poverty Line</b> |                                |                           |                           |                        |                           |                        |                           |                        |                           |                        |                        |
| 18.2                                     | 24.0                           | 535                       | 2.5                       | 47                     | 3.5                       | 72                     | 15.2                      | 353                    | 2.9                       | 63                     | 4.94                   |
| <b>Race of Householder</b>               |                                |                           |                           |                        |                           |                        |                           |                        |                           |                        |                        |
| White .....                              | 76.6                           | 31.6                      | 700                       | 3.3                    | 65                        | 3.6                    | 74                        | 19.7                   | 450                       | 4.9                    | 110                    |
| Black .....                              | 10.9                           | 25.4                      | 593                       | 2.0                    | 40                        | 2.8                    | 59                        | 15.9                   | 388                       | 4.8                    | 105                    |
| Other .....                              | 3.0                            | 20.3                      | 502                       | 2.2                    | 46                        | 1.7                    | 38                        | 14.0                   | 363                       | 2.3                    | 56                     |
| <b>Householder of Hispanic Descent</b>   |                                |                           |                           |                        |                           |                        |                           |                        |                           |                        |                        |
| Yes .....                                | 5.0                            | 25.8                      | 639                       | 1.9                    | 43                        | 2.5                    | 60                        | 16.9                   | 425                       | 4.5                    | 110                    |
| No .....                                 | 85.5                           | 30.7                      | 683                       | 3.2                    | 62                        | 3.5                    | 72                        | 19.2                   | 441                       | 4.8                    | 108                    |
| <b>Age of Householder</b>                |                                |                           |                           |                        |                           |                        |                           |                        |                           |                        |                        |
| Under 25 Years .....                     | 6.5                            | 24.6                      | 540                       | 3.2                    | 65                        | 3.7                    | 77                        | 13.9                   | 314                       | 3.8                    | 84                     |
| 25 to 34 Years .....                     | 21.5                           | 29.1                      | 653                       | 3.0                    | 60                        | 3.6                    | 75                        | 17.8                   | 415                       | 4.6                    | 103                    |
| 35 to 44 Years .....                     | 18.0                           | 35.4                      | 787                       | 3.7                    | 73                        | 3.9                    | 80                        | 22.4                   | 513                       | 5.4                    | 121                    |
| 45 to 59 Years .....                     | 18.8                           | 36.0                      | 797                       | 3.3                    | 63                        | 3.7                    | 75                        | 23.1                   | 529                       | 5.9                    | 130                    |
| 60 Years and Over .....                  | 25.7                           | 25.6                      | 578                       | 2.7                    | 51                        | 2.8                    | 58                        | 16.0                   | 377                       | 4.0                    | 92                     |
| <b>Household Size</b>                    |                                |                           |                           |                        |                           |                        |                           |                        |                           |                        |                        |
| 1 Person .....                           | 21.6                           | 19.3                      | 435                       | 3.0                    | 58                        | 1.9                    | 40                        | 11.6                   | 273                       | 2.8                    | 64                     |
| 2 Persons .....                          | 30.7                           | 29.9                      | 665                       | 3.2                    | 62                        | 3.4                    | 71                        | 18.3                   | 421                       | 5.0                    | 111                    |
| 3 Persons .....                          | 15.4                           | 34.8                      | 770                       | 3.3                    | 65                        | 4.2                    | 86                        | 21.6                   | 493                       | 5.6                    | 126                    |
| 4 Persons .....                          | 13.6                           | 38.6                      | 858                       | 3.3                    | 65                        | 4.4                    | 90                        | 24.6                   | 560                       | 6.4                    | 142                    |
| 5 Persons .....                          | 6.1                            | 38.8                      | 884                       | 2.6                    | 50                        | 4.5                    | 91                        | 25.8                   | 608                       | 6.0                    | 134                    |
| 6 or More Persons .....                  | 3.1                            | 39.2                      | 915                       | 2.9                    | 55                        | 4.9                    | 103                       | 27.5                   | 663                       | 3.9                    | 93                     |
| <b>All Electricity Paid by Household</b> |                                |                           |                           |                        |                           |                        |                           |                        |                           |                        |                        |
| Yes .....                                | 83.2                           | 31.5                      | 703                       | 3.2                    | 62                        | 3.6                    | 74                        | 19.7                   | 456                       | 5.0                    | 112                    |
| Budget Plan .....                        | 1.3                            | 64.3                      | 1,246                     | 23.3                   | 440                       | 9.0                    | 174                       | 24.9                   | 489                       | 7.1                    | 143                    |
| No Budget Plan .....                     | 81.9                           | 30.9                      | 694                       | 2.8                    | 55                        | 3.5                    | 72                        | 19.6                   | 455                       | 5.0                    | 111                    |
| No .....                                 | 7.3                            | 18.9                      | 423                       | 2.6                    | 55                        | 2.0                    | 43                        | 11.3                   | 263                       | 2.9                    | 62                     |
| <b>All-Electric Home</b>                 |                                |                           |                           |                        |                           |                        |                           |                        |                           |                        |                        |
| Yes .....                                | 15.0                           | 54.0                      | 1,075                     | 15.9                   | 305                       | 9.1                    | 182                       | 21.1                   | 424                       | 7.9                    | 165                    |
| No .....                                 | 75.5                           | 25.8                      | 602                       | .6                     | 13                        | 2.4                    | 49                        | 18.6                   | 443                       | 4.2                    | 97                     |

See footnotes at end of table.

**Table 25. Electricity Consumption and Expenditures by End Use per Household, 1987 (Continued)**

| Household Characteristics                  | Number of Households (million) | All End Uses              |                        | Space Heating             |                        | Water Heating             |                        | Appliances                |                        | Air Conditioning          |                        | RSE Row Factors |
|--|--------------------------------|---------------------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|-----------------|
|  |                                | Consumption (million Btu) | Expenditures (dollars) |                 |
| RSE Column Factors:                        | 0.835                          | 0.610                     | 0.564                  | 2.371                     | 2.295                  | 1.463                     | 1.473                  | 0.443                     | 0.456                  | 1.214                     | 1.210                  |                 |
| <b>Secondary Heating</b>                   |                                |                           |                        |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Yes .....                                  | 37.4                           | 37.0                      | 795                    | 4.0                       | 77                     | 4.5                       | 90                     | 22.9                      | 505                    | 5.6                       | 123                    | 3.34            |
| Over 33 Percent of Home's Total Heat ..... | 3.2                            | 38.8                      | 808                    | 3.7                       | 71                     | 6.5                       | 129                    | 24.4                      | 518                    | 4.2                       | 91                     | 9.35            |
| No .....                                   | 53.2                           | 25.9                      | 600                    | 2.5                       | 50                     | 2.7                       | 58                     | 16.3                      | 394                    | 4.3                       | 98                     | 2.87            |

□ Data withheld either because the RSE was greater than 50 percent or fewer than 10 households were sampled.

Notes: • End-use values are statistical estimates based on the 1987 RECS. • See Appendix B for methodology of end-use estimates.

• Electricity consumption is based on site electricity. No adjustment is made for primary fuels consumed to produce electricity. • To obtain a Relative Standard Error (RSE) percentage for any table cell, multiply the cell's corresponding column and row factors. • Because of rounding, data may not sum to totals. • See "Glossary" for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use Division, Forms EIA-457 A, B, C, E of the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).

**Table 26. Fuel Oil or Kerosene Consumption and Expenditures per Household by End Use, 1987**

| Household Characteristics                               | Number of Households (million) | All End Uses              |                        | Space Heating             |                        | RSE Row Factors |
|---|--------------------------------|---------------------------|------------------------|---------------------------|------------------------|-----------------|
|   |                                | Consumption (million Btu) | Expenditures (dollars) | Consumption (million Btu) | Expenditures (dollars) |                 |
| RSE Column Factors:                                     | 1.389                          | 0.930                     | 0.922                  | 0.917                     | 0.915                  |                 |
| <b>Total U.S. Households Using Fuel Oil or Kerosene</b> | 17.4                           | 70.3                      | 414                    | 60.5                      | 359                    | 3.18            |
| <b>Census Region and Division</b>                       |                                |                           |                        |                           |                        |                 |
| Northeast   | 9.1                            | 96.0                      | 556                    | 78.0                      | 455                    | 3.55            |
| New England   | 2.6                            | 102.1                     | 604                    | 83.6                      | 496                    | 3.82            |
| Middle Atlantic   | 6.5                            | 93.6                      | 537                    | 75.8                      | 440                    | 4.59            |
| Midwest   | 3.1                            | 51.8                      | 309                    | 51.4                      | 307                    | 6.42            |
| East North Central                                      | 2.5                            | 54.2                      | 326                    | 53.7                      | 323                    | 6.19            |
| West North Central                                      | .6                             | 41.6                      | 239                    | 41.2                      | 237                    | 22.26           |
| South   | 4.6                            | 37.0                      | 233                    | 36.2                      | 228                    | 7.70            |
| South Atlantic  | 3.6                            | 41.1                      | 256                    | 40.0                      | 250                    | 8.26            |
| East South Central                                      | 1.0                            | 25.8                      | 168                    | 25.7                      | 168                    | 22.25           |
| West South Central                                      | Q                              | Q                         | Q                      | Q                         | Q                      | a               |
| West  | .6                             | 31.1                      | 190                    | 29.9                      | 177                    | 25.24           |
| Mountain  | .2                             | Q                         | Q                      | Q                         | Q                      | 28.01           |
| Pacific   | .4                             | 32.9                      | 207                    | 31.2                      | 189                    | 22.75           |
| <b>Metropolitan Status</b>                              |                                |                           |                        |                           |                        |                 |
| Metropolitan  | 12.6                           | 75.9                      | 444                    | 63.6                      | 375                    | 3.62            |
| Central City  | 5.0                            | 66.9                      | 372                    | 54.7                      | 310                    | 6.90            |
| Outside Central City                                    | 7.6                            | 81.8                      | 491                    | 69.5                      | 418                    | 5.02            |
| Nonmetropolitan   | 4.8                            | 55.4                      | 334                    | 52.4                      | 317                    | 8.68            |
| <b>Climate Zone</b>                                     |                                |                           |                        |                           |                        |                 |
| Under 2,000 CDD and --                                  |                                |                           |                        |                           |                        |                 |
| Over 7,000 HDD  | 2.8                            | 74.5                      | 433                    | 68.5                      | 399                    | 6.91            |
| 5,500 to 7,000 HDD                                      | 5.0                            | 88.2                      | 529                    | 74.8                      | 449                    | 6.43            |
| 4,000 to 5,499 HDD                                      | 7.1                            | 72.5                      | 415                    | 60.6                      | 352                    | 5.86            |
| Under 4,000 HDD   | 1.8                            | 29.4                      | 192                    | 28.9                      | 189                    | 13.90           |
| 2,000 CDD or More and --                                |                                |                           |                        |                           |                        |                 |
| Under 4,000 HDD   | .7                             | 12.6                      | 99                     | Q                         | Q                      | 38.54           |
| <b>Housing Structure by Status of Unit</b>              |                                |                           |                        |                           |                        |                 |
| Single-Family Detached                                  | 11.1                           | 71.8                      | 434                    | 63.5                      | 384                    | 3.76            |
| Owned   | 9.7                            | 74.9                      | 452                    | 65.6                      | 396                    | 3.66            |
| Rented  | 1.4                            | 50.5                      | 312                    | 48.5                      | 298                    | 12.35           |
| Single-Family Attached                                  | .9                             | 78.1                      | 498                    | 70.7                      | 452                    | 14.13           |
| Owned   | .7                             | 84.1                      | 535                    | 75.4                      | 480                    | 15.39           |
| Rented  | .2                             | 53.5                      | 352                    | 51.4                      | 339                    | 25.22           |
| Building of 2 to 4 Units                                | 1.7                            | 78.6                      | 473                    | 66.3                      | 398                    | 7.09            |
| Owned   | .5                             | 95.2                      | 575                    | 83.1                      | 501                    | 15.53           |
| Rented  | 1.2                            | 71.5                      | 429                    | 59.1                      | 355                    | 9.05            |
| Building of 5 or More Units                             | 2.5                            | 70.1                      | 329                    | 50.2                      | 238                    | 8.61            |
| Owned   | .2                             | 84.5                      | 308                    | 47.1                      | 226                    | 29.53           |
| Rented  | 2.3                            | 70.5                      | 331                    | 50.4                      | 239                    | 8.76            |
| Mobile Home   | 1.3                            | 39.7                      | 257                    | 39.7                      | 257                    | 10.24           |
| Owned   | 1.0                            | 34.8                      | 228                    | 34.8                      | 228                    | 14.40           |
| Rented  | .2                             | 62.9                      | 393                    | 62.9                      | 393                    | 18.59           |
| <b>Measured Heated Area of Residence (square feet)</b>  |                                |                           |                        |                           |                        |                 |
| Fewer than 600  | 1.7                            | 63.6                      | 335                    | 48.1                      | 256                    | 8.44            |
| 600 to 999  | 4.1                            | 53.3                      | 303                    | 45.4                      | 263                    | 7.54            |
| 1,000 to 1,599  | 4.4                            | 59.7                      | 361                    | 51.5                      | 313                    | 5.77            |
| 1,600 to 1,999  | 2.3                            | 69.2                      | 422                    | 62.5                      | 381                    | 8.23            |
| 2,000 to 2,399  | 1.7                            | 82.8                      | 505                    | 73.0                      | 446                    | 8.69            |
| 2,400 to 2,999  | 2.0                            | 86.1                      | 503                    | 73.3                      | 435                    | 6.39            |
| 3,000 or More   | 1.4                            | 127.7                     | 755                    | 112.8                     | 665                    | 8.69            |

See footnotes at end of table.

**Table 26. Fuel Oil or Kerosene Consumption and Expenditures per Household by End Use, 1987 (Continued)**

| Household Characteristics                     | Number of Households (million) | All End Uses              |                        | Space Heating             |                        | RSE Row Factors |
|---|--------------------------------|---------------------------|------------------------|---------------------------|------------------------|-----------------|
|   |                                | Consumption (million Btu) | Expenditures (dollars) | Consumption (million Btu) | Expenditures (dollars) |                 |
| RSE Column Factors:                           | 1.389                          | 0.930                     | 0.922                  | 0.917                     | 0.915                  |                 |
| <b>Year of Construction</b>                   |                                |                           |                        |                           |                        |                 |
| 1939 or Before .....                          | 6.1                            | 84.3                      | 498                    | 74.9                      | 445                    | 5.58            |
| 1940 to 1949 .....                            | 2.0                            | 63.0                      | 360                    | 54.5                      | 314                    | 9.27            |
| 1950 to 1959 .....                            | 2.6                            | 81.1                      | 485                    | 68.6                      | 410                    | 7.80            |
| 1960 to 1969 .....                            | 2.7                            | 67.1                      | 378                    | 54.1                      | 309                    | 7.99            |
| 1970 to 1974 .....                            | 1.4                            | 50.0                      | 301                    | 43.1                      | 263                    | 12.61           |
| 1975 to 1979 .....                            | 1.7                            | 49.4                      | 305                    | 42.5                      | 263                    | 11.83           |
| 1980 to 1984 .....                            | .6                             | 35.2                      | 216                    | 29.8                      | 185                    | 15.26           |
| 1985 or After .....                           | .2                             | Q                         | Q                      | Q                         | Q                      | 23.79           |
| <b>1987 Family Income</b>                     |                                |                           |                        |                           |                        |                 |
| Less than \$5,000 .....                       | 1.0                            | 54.3                      | 313                    | 45.4                      | 270                    | 16.18           |
| \$5,000 to \$9,999 .....                      | 2.1                            | 72.3                      | 416                    | 63.8                      | 372                    | 8.96            |
| \$10,000 to \$14,999 .....                    | 2.6                            | 60.4                      | 355                    | 54.0                      | 320                    | 8.00            |
| \$15,000 to \$19,999 .....                    | 1.7                            | 67.1                      | 402                    | 57.2                      | 345                    | 9.71            |
| \$20,000 to \$24,999 .....                    | 1.8                            | 62.9                      | 377                    | 54.4                      | 329                    | 7.80            |
| \$25,000 to \$34,999 .....                    | 3.5                            | 62.6                      | 364                    | 54.7                      | 320                    | 7.72            |
| \$35,000 to \$49,999 .....                    | 2.4                            | 79.6                      | 470                    | 66.9                      | 396                    | 7.24            |
| \$50,000 or More .....                        | 2.2                            | 97.6                      | 582                    | 81.8                      | 489                    | 10.09           |
| <b>Below 100 Percent of Poverty Line</b>      |                                |                           |                        |                           |                        |                 |
| Below 100 Percent of Poverty Line .....       | 2.0                            | 55.1                      | 317                    | 46.9                      | 277                    | 9.14            |
| <b>Below 125 Percent of Poverty Line</b>      |                                |                           |                        |                           |                        |                 |
| Below 125 Percent of Poverty Line .....       | 3.2                            | 59.7                      | 345                    | 50.7                      | 299                    | 6.99            |
| <b>Race of Householder</b>                    |                                |                           |                        |                           |                        |                 |
| White .....                                   | 14.5                           | 71.4                      | 423                    | 62.2                      | 371                    | 3.37            |
| Black .....                                   | 2.5                            | 63.8                      | 367                    | 52.7                      | 308                    | 10.99           |
| Other .....                                   | .4                             | 68.6                      | 364                    | 48.4                      | 258                    | 11.27           |
| <b>Householder of Hispanic Descent</b>        |                                |                           |                        |                           |                        |                 |
| Yes .....                                     | .9                             | 74.6                      | 398                    | 56.8                      | 310                    | 10.62           |
| No .....                                      | 16.6                           | 70.0                      | 415                    | 60.7                      | 362                    | 3.22            |
| <b>Age of Householder</b>                     |                                |                           |                        |                           |                        |                 |
| Under 25 Years .....                          | .8                             | 63.9                      | 384                    | 59.5                      | 360                    | 15.10           |
| 25 to 34 Years .....                          | 3.8                            | 59.7                      | 345                    | 50.3                      | 295                    | 6.32            |
| 35 to 44 Years .....                          | 3.8                            | 64.9                      | 387                    | 53.1                      | 319                    | 6.20            |
| 45 to 59 Years .....                          | 3.7                            | 72.0                      | 433                    | 62.8                      | 379                    | 6.54            |
| 60 Years and Over .....                       | 5.3                            | 81.3                      | 473                    | 71.7                      | 419                    | 5.86            |
| <b>Household Size</b>                         |                                |                           |                        |                           |                        |                 |
| 1 Person .....                                | 3.9                            | 63.7                      | 365                    | 54.8                      | 318                    | 6.60            |
| 2 Persons .....                               | 5.7                            | 73.7                      | 433                    | 65.7                      | 388                    | 5.85            |
| 3 Persons .....                               | 3.2                            | 70.1                      | 425                    | 60.3                      | 367                    | 6.34            |
| 4 Persons .....                               | 2.9                            | 68.8                      | 402                    | 58.4                      | 345                    | 6.97            |
| 5 Persons .....                               | 1.2                            | 72.7                      | 438                    | 55.1                      | 332                    | 9.92            |
| 6 or More Persons .....                       | .6                             | 81.8                      | 488                    | 69.5                      | 416                    | 19.88           |
| <b>Fuel Oil or Kerosene Paid by Household</b> |                                |                           |                        |                           |                        |                 |
| Yes .....                                     | 14.0                           | 68.2                      | 416                    | 60.7                      | 370                    | 3.63            |
| Budget Plan .....                             | 1.4                            | 123.8                     | 755                    | 106.5                     | 650                    | 7.30            |
| No Budget Plan .....                          | 12.6                           | 61.9                      | 377                    | 55.6                      | 339                    | 3.97            |
| No .....                                      | 3.4                            | 78.6                      | 406                    | 59.7                      | 312                    | 6.79            |

See footnotes at end of table.

**Table 26. Fuel Oil or Kerosene Consumption and Expenditures per Household by End Use, 1987 (Continued)**

| Household Characteristics                  | Number of Households (million) | All End Uses              |                        | Space Heating             |                        | RSE Row Factors |
|--|--------------------------------|---------------------------|------------------------|---------------------------|------------------------|-----------------|
|  |                                | Consumption (million Btu) | Expenditures (dollars) | Consumption (million Btu) | Expenditures (dollars) |                 |
| RSE Column Factors:                        | 1.389                          | 0.930                     | 0.922                  | 0.917                     | 0.915                  |                 |
| <b>Secondary Heating</b>                   |                                |                           |                        |                           |                        |                 |
| Yes .....                                  | 10.0                           | 54.2                      | 326                    | 48.9                      | 296                    | 4.83            |
| Over 33 Percent of Home's Total Heat ..... | 1.3                            | 52.7                      | 323                    | 48.7                      | 300                    | 13.50           |
| No .....                                   | 7.4                            | 92.0                      | 532                    | 76.3                      | 444                    | 4.60            |

\* No applicable RSE row factor.

o Data withheld either because the RSE was greater than 50 percent or fewer than 10 households were sampled.

Notes: • Includes only households using fuel oil or kerosene. • End-use values are statistical estimates based on the 1987 RECS. • See Appendix B for methodology of end-use estimates. • To obtain a Relative Standard Error (RSE) percentage for any table cell, multiply the cell's corresponding column and row factors. • Because of rounding, data may not sum to totals. • See "Glossary" for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use Division, Forms EIA-457 A, B, C, G of the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).

**Table 27. Liquefied Petroleum Gas Consumption and Expenditures by End Use per Household, 1987**

| Household Characteristics  | Number of Households (million) | All End Uses              |                        | Space Heating             |                        | Water Heating             |                        | Appliances                |                        | RSE Row Factors |
|--|--------------------------------|---------------------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|-----------------|
|  |                                | Consumption (million Btu) | Expenditures (dollars) |                 |
| RSE Column Factors:  |                                | 1.136                     | 0.778                  | 0.643                     | 0.933                  | 0.870                     | 1.383                  | 1.273                     | 1.049                  | 1.173           |
| <b>Total U.S. Households Using Liquefied Petroleum Gas .....</b> | 7.7                            | 41.1                      | 366                    | 28.9                      | 241                    | 7.3                       | 65                     | 4.8                       | 60                     | 7.62            |
| <b>Census Region and Division</b>                                |                                |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Northeast .....  | 1.1                            | 16.5                      | 218                    | 5.9                       | 68                     | 4.0                       | 50                     | 6.5                       | 101                    | 19.71           |
| New England .....  | .5                             | 18.9                      | 226                    | Q                         | Q                      | 6.9                       | 75                     | 5.1                       | 81                     | 15.75           |
| Middle Atlantic .....  | .6                             | 14.7                      | 212                    | Q                         | Q                      | Q                         | Q                      | 7.6                       | 115                    | 27.96           |
| Midwest .....  | 2.3                            | 57.6                      | 436                    | 44.4                      | 331                    | 9.3                       | 71                     | 3.8                       | 34                     | 10.45           |
| East North Central .....   | 1.5                            | 55.5                      | 454                    | 43.5                      | 349                    | 8.6                       | 71                     | 3.5                       | 33                     | 15.06           |
| West North Central .....   | .8                             | 61.6                      | 402                    | 46.4                      | 294                    | 10.8                      | 71                     | 4.5                       | 36                     | 11.32           |
| South .....  | 3.3                            | 35.8                      | 342                    | 24.7                      | 226                    | 6.3                       | 55                     | 4.8                       | 62                     | 12.12           |
| South Atlantic .....   | 1.9                            | 30.5                      | 341                    | 20.1                      | 207                    | 4.7                       | 51                     | 5.7                       | 82                     | 17.21           |
| East South Central .....   | .8                             | 41.3                      | 378                    | 34.1                      | 305                    | 4.3                       | 39                     | 2.9                       | 33                     | 15.68           |
| West South Central .....   | .7                             | 44.0                      | 306                    | 26.8                      | 189                    | Q                         | 81                     | 4.6                       | 36                     | 30.70           |
| West .....   | 1.0                            | 48.5                      | 451                    | 33.1                      | 283                    | 10.2                      | 101                    | 5.2                       | 67                     | 19.10           |
| Mountain .....   | Q                              | 78.7                      | 504                    | 60.4                      | 371                    | 12.2                      | 80                     | Q                         | Q                      | 30.02           |
| Pacific .....  | .7                             | 38.1                      | 433                    | 23.7                      | 252                    | 9.5                       | 108                    | 4.9                       | 72                     | 22.68           |
| <b>Metropolitan Status</b>                                       |                                |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Metropolitan .....   | 3.5                            | 37.0                      | 360                    | 23.1                      | 210                    | 7.9                       | 72                     | 5.9                       | 78                     | 11.14           |
| Central City .....   | .6                             | 29.7                      | 343                    | 17.5                      | 190                    | 7.8                       | 88                     | 4.3                       | 65                     | 21.42           |
| Outside Central City .....                                       | 2.9                            | 38.4                      | 363                    | 24.2                      | 214                    | 7.9                       | 69                     | 6.2                       | 80                     | 12.43           |
| Nonmetropolitan .....  | 4.2                            | 44.5                      | 371                    | 33.8                      | 268                    | 6.8                       | 59                     | 3.9                       | 45                     | 9.46            |
| <b>Climate Zone</b>  |                                |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Under 2,000 CDD and--  |                                |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Over 7,000 HDD .....   | 1.7                            | 48.5                      | 389                    | 36.2                      | 273                    | 7.8                       | 65                     | 4.4                       | 51                     | 19.38           |
| 5,500 to 7,000 HDD .....   | 1.4                            | 39.4                      | 354                    | 27.5                      | 228                    | 7.1                       | 66                     | 4.9                       | 61                     | 15.92           |
| 4,000 to 5,499 HDD .....   | 1.4                            | 45.8                      | 371                    | 34.7                      | 269                    | 6.6                       | 51                     | 4.5                       | 51                     | 14.80           |
| Under 4,000 HDD .....  | 1.6                            | 46.0                      | 439                    | 30.5                      | 283                    | 9.2                       | 77                     | 6.3                       | 79                     | 17.26           |
| 2,000 CDD or More and --   |                                |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Under 4,000 HDD .....  | 1.6                            | 25.7                      | 274                    | 15.9                      | 155                    | 5.8                       | 63                     | 4.0                       | 56                     | 17.04           |
| <b>Housing Structure by Status of Unit</b>                       |                                |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Single-Family Detached .....                                     | 5.7                            | 44.4                      | 384                    | 31.2                      | 254                    | 8.5                       | 75                     | 4.7                       | 55                     | 8.33            |
| Owned .....  | 4.7                            | 45.8                      | 397                    | 32.6                      | 266                    | 8.5                       | 74                     | 4.8                       | 57                     | 9.10            |
| Rented .....   | 1.0                            | 37.6                      | 323                    | 24.7                      | 197                    | 8.9                       | 81                     | 4.0                       | 45                     | 16.03           |
| Mobile Home .....  | 1.9                            | 32.8                      | 323                    | 23.5                      | 214                    | 4.0                       | 35                     | 5.3                       | 74                     | 17.03           |
| Owned .....  | 1.5                            | 34.4                      | 336                    | 25.0                      | 228                    | 4.0                       | 34                     | 5.4                       | 74                     | 18.47           |
| Rented .....   | .4                             | 26.7                      | 276                    | 18.0                      | 165                    | Q                         | Q                      | 4.9                       | 73                     | 26.10           |
| Other .....  | .1                             | Q                         | 173                    | Q                         | Q                      | Q                         | Q                      | Q                         | Q                      | 47.25           |
| <b>Measured Heated Area of Residence (square feet)</b>           |                                |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Fewer than 600 .....   | .9                             | 27.9                      | 289                    | 18.4                      | 168                    | 4.2                       | 48                     | 5.3                       | 74                     | 16.85           |
| 600 to 999 .....   | 2.3                            | 32.4                      | 313                    | 21.1                      | 185                    | 6.0                       | 55                     | 5.3                       | 73                     | 11.90           |
| 1,000 to 1,599 .....   | 2.3                            | 48.0                      | 399                    | 34.9                      | 286                    | 9.2                       | 74                     | 3.9                       | 40                     | 12.14           |
| 1,600 to 1,999 .....   | .8                             | 42.0                      | 379                    | 29.5                      | 259                    | 7.7                       | 68                     | 4.8                       | 52                     | 18.50           |
| 2,000 to 2,399 .....   | .5                             | 39.9                      | 409                    | 24.5                      | 241                    | 8.2                       | 77                     | 7.2                       | 91                     | 29.63           |
| 2,400 to 2,999 .....   | .4                             | 52.3                      | 432                    | 41.9                      | 311                    | 6.1                       | 62                     | 4.4                       | 59                     | 20.33           |
| 3,000 or More .....  | .3                             | 76.0                      | 534                    | 60.7                      | 406                    | 11.6                      | 91                     | 3.7                       | 36                     | 24.93           |
| <b>Year of Construction</b>                                      |                                |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| 1939 or Before .....   | 1.8                            | 36.9                      | 310                    | 26.5                      | 192                    | 6.2                       | 58                     | 4.2                       | 59                     | 12.98           |
| 1940 to 1949 .....   | .7                             | 45.2                      | 432                    | 32.4                      | 295                    | 8.7                       | 87                     | 4.2                       | 50                     | 20.42           |
| 1950 to 1959 .....   | 1.0                            | 44.0                      | 418                    | 34.8                      | 319                    | 6.4                       | 62                     | 2.8                       | 37                     | 17.74           |
| 1960 to 1969 .....   | 1.0                            | 38.0                      | 324                    | 27.2                      | 217                    | 5.8                       | 51                     | 5.0                       | 56                     | 17.53           |
| 1970 to 1974 .....   | 1.0                            | 48.0                      | 462                    | 34.0                      | 300                    | 6.3                       | 59                     | 7.7                       | 103                    | 16.77           |
| 1975 to 1979 .....   | 1.0                            | 47.0                      | 395                    | 29.3                      | 238                    | 10.9                      | 84                     | 6.9                       | 74                     | 17.72           |
| 1980 to 1984 .....   | .8                             | 31.7                      | 262                    | 18.6                      | 149                    | 9.1                       | 71                     | 4.0                       | 41                     | 18.11           |
| 1985 or After .....  | .3                             | 41.7                      | 403                    | 33.1                      | 318                    | Q                         | Q                      | 3.0                       | 37                     | 28.54           |

See footnotes at end of table.

**Table 27. Liquefied Petroleum Gas Consumption and Expenditures by End Use per Household, 1987 (Continued)**

| Household Characteristics                  | Number of Households (million) | All End Uses              |                        | Space Heating             |                        | Water Heating             |                        | Appliances                |                        | RSE Row Factors |
|--|--------------------------------|---------------------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|-----------------|
|  |                                | Consumption (million Btu) | Expenditures (dollars) |                 |
|  |                                | RSE Column Factors:       | 1.136                  | 0.778                     | 0.643                  | 0.933                     | 0.870                  | 1.383                     | 1.273                  | 1.049           |
| <b>1987 Family Income</b>                  |                                |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Less than \$5,000 .....                    | 0.9                            | 35.7                      | 338                    | 26.4                      | 237                    | 5.8                       | 59                     | 3.5                       | 42                     | 15.59           |
| \$5,000 to \$9,999 .....                   | 1.4                            | 31.6                      | 294                    | 20.5                      | 178                    | 6.4                       | 55                     | 4.7                       | 62                     | 15.50           |
| \$10,000 to \$14,999 .....                 | 1.3                            | 45.3                      | 384                    | 33.5                      | 273                    | 7.6                       | 62                     | 4.2                       | 49                     | 17.09           |
| \$15,000 to \$19,999 .....                 | .7                             | 47.8                      | 440                    | 31.3                      | 256                    | 8.8                       | 73                     | 7.7                       | 111                    | 19.07           |
| \$20,000 to \$24,999 .....                 | .8                             | 43.7                      | 368                    | 32.9                      | 262                    | 6.6                       | 56                     | 4.1                       | 50                     | 17.45           |
| \$25,000 to \$34,999 .....                 | 1.3                            | 38.7                      | 355                    | 27.1                      | 234                    | 7.5                       | 72                     | 4.1                       | 49                     | 15.56           |
| \$35,000 to \$49,999 .....                 | .6                             | 44.1                      | 366                    | 29.5                      | 234                    | 10.7                      | 91                     | 4.0                       | 41                     | 18.72           |
| \$50,000 or More .....                     | .6                             | 53.1                      | 474                    | 38.0                      | 311                    | 6.4                       | 60                     | 8.8                       | 104                    | 22.85           |
| <b>Below 100 Percent of Poverty Line</b>   |                                |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Below 100 Percent of Poverty Line .....    | 1.6                            | 39.8                      | 339                    | 25.9                      | 212                    | 9.2                       | 77                     | 4.7                       | 49                     | 13.32           |
| <b>Below 125 Percent of Poverty Line</b>   |                                |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Below 125 Percent of Poverty Line .....    | 2.5                            | 38.2                      | 341                    | 25.3                      | 213                    | 8.3                       | 72                     | 4.6                       | 56                     | 11.10           |
| <b>Race of Householder</b>                 |                                |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| White .....                                | 6.7                            | 41.5                      | 370                    | 29.9                      | 250                    | 6.9                       | 61                     | 4.7                       | 59                     | 7.83            |
| Black .....                                | .8                             | 30.6                      | 296                    | 19.5                      | 178                    | 7.1                       | 73                     | 4.0                       | 44                     | 18.10           |
| Other .....                                | .2                             | 61.4                      | 460                    | Q                         | Q                      | 19.2                      | 149                    | 12.5                      | Q                      | 32.71           |
| <b>Householder of Hispanic Descent</b>     |                                |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Yes .....                                  | .2                             | 61.6                      | 462                    | Q                         | Q                      | Q                         | Q                      | Q                         | Q                      | 34.05           |
| No .....                                   | 7.5                            | 40.5                      | 363                    | 28.6                      | 240                    | 7.1                       | 63                     | 4.8                       | 60                     | 7.68            |
| <b>Age of Householder</b>                  |                                |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Under 25 Years .....                       | .4                             | 29.4                      | 326                    | 17.7                      | 160                    | Q                         | Q                      | Q                         | Q                      | 28.56           |
| 25 to 34 Years .....                       | 1.6                            | 38.4                      | 335                    | 26.0                      | 215                    | 8.1                       | 68                     | 4.4                       | 53                     | 11.96           |
| 35 to 44 Years .....                       | 1.5                            | 37.8                      | 326                    | 20.1                      | 155                    | 9.6                       | 78                     | 8.1                       | 93                     | 16.67           |
| 45 to 59 Years .....                       | 1.8                            | 42.7                      | 377                    | 33.0                      | 278                    | 6.4                       | 58                     | 3.3                       | 41                     | 14.22           |
| 60 Years and Over .....                    | 2.4                            | 45.7                      | 408                    | 35.2                      | 299                    | 6.7                       | 66                     | 3.8                       | 44                     | 10.90           |
| <b>Household Size</b>                      |                                |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| 1 Person .....                             | 1.5                            | 42.1                      | 376                    | 34.1                      | 292                    | 4.5                       | 43                     | 3.5                       | 40                     | 17.41           |
| 2 Persons .....                            | 2.5                            | 39.3                      | 349                    | 28.5                      | 240                    | 7.0                       | 66                     | 3.8                       | 43                     | 8.52            |
| 3 Persons .....                            | 1.3                            | 36.8                      | 336                    | 27.1                      | 232                    | 5.7                       | 49                     | 4.0                       | 55                     | 12.90           |
| 4 Persons .....                            | 1.5                            | 44.3                      | 393                    | 26.6                      | 210                    | 9.9                       | 80                     | 7.7                       | 103                    | 15.55           |
| 5 Persons .....                            | .5                             | 40.2                      | 350                    | 26.9                      | 227                    | 8.8                       | 73                     | 4.5                       | 51                     | 17.84           |
| 6 or More Persons .....                    | .4                             | 52.0                      | 450                    | 29.1                      | 224                    | 13.8                      | 119                    | 9.1                       | 107                    | 25.26           |
| <b>All LPG Paid by Household</b>           |                                |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Yes .....                                  | 7.3                            | 41.8                      | 371                    | 29.7                      | 248                    | 7.3                       | 64                     | 4.8                       | 60                     | 7.69            |
| Budget Plan .....                          | 4.0                            | 61.8                      | 504                    | 50.5                      | 414                    | 8.1                       | 62                     | 3.2                       | 28                     | 7.97            |
| No Budget Plan .....                       | 3.3                            | 17.9                      | 213                    | 4.8                       | 48                     | 6.3                       | 67                     | 6.8                       | 97                     | 13.03           |
| No .....                                   | .4                             | 27.5                      | 261                    | 14.1                      | 120                    | 8.6                       | 78                     | 4.7                       | 63                     | 28.32           |
| <b>Secondary Heating</b>                   |                                |                           |                        |                           |                        |                           |                        |                           |                        |                 |
| Yes .....                                  | 4.2                            | 43.5                      | 391                    | 31.4                      | 273                    | 7.7                       | 69                     | 4.4                       | 49                     | 9.66            |
| Over 33 Percent of Home's Total Heat ..... | .6                             | 25.8                      | 255                    | 16.2                      | 154                    | 5.9                       | 52                     | 3.8                       | 48                     | 23.65           |
| No .....                                   | 3.5                            | 38.1                      | 336                    | 25.9                      | 204                    | 6.8                       | 59                     | 5.4                       | 73                     | 10.69           |

<sup>a</sup> Data withheld either because the RSE was greater than 50 percent or fewer than 10 households were sampled.

Notes: • Includes only households that use LPG. • End-use values are statistical estimates based on the 1987 RECS. • See Appendix B for methodology of end-use estimates. • To obtain a Relative Standard Error (RSE) percentage for any table cell, multiply the cell's corresponding column and row factors. • Because of rounding, data may not sum to totals. • See "Glossary" for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use Division, Forms EIA-457 A, B, C, D of the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).

**Table 28. Space-Heating Natural Gas Consumption and Expenditures per Household when Natural Gas was the Main Heating Fuel, 1987**

| Household Characteristics                              | Number of Households (million) | Consumption (million Btu) | Expenditures (dollars) | Heating Intensity                 |   | RSE Row Factors |
|--|--------------------------------|---------------------------|------------------------|-----------------------------------|---|-----------------|
|  |                                |                           |                        | Consumption (Btu/hdd*square foot) | Expenditures (cents/hdd*1000 square feet) |                 |
|  |                                |                           |                        | 0.773                             | 0.867                                     |                 |
| RSE Column Factors:                                    | 1.669                          | 0.927                     | 0.943                  |                                   |   |                 |
| <b>Total U.S. Households .....</b>                     | 50.0                           | 66.9                      | 356                    | 10.0                              | 5.3                                       | 2.05            |
| <b>Census Region and Division</b>                      |                                |                           |                        |                                   |   |                 |
| Northeast .....  | 8.1                            | 89.5                      | 556                    | 9.6                               | 6.0                                       | 4.47            |
| New England .....                                      | 1.2                            | 83.9                      | 552                    | 10.2                              | 6.7                                       | 5.14            |
| Middle Atlantic .....                                  | 6.9                            | 90.4                      | 556                    | 9.6                               | 5.9                                       | 5.14            |
| Midwest .....  | 16.5                           | 84.6                      | 416                    | 8.7                               | 4.3                                       | 2.57            |
| East North Central .....                               | 11.8                           | 87.6                      | 438                    | 8.8                               | 4.4                                       | 3.20            |
| West North Central .....                               | 4.8                            | 77.1                      | 360                    | 8.3                               | 3.9                                       | 4.91            |
| South .....  | 13.5                           | 54.2                      | 300                    | 12.6                              | 7.0                                       | 5.32            |
| South Atlantic .....                                   | 5.3                            | 61.7                      | 398                    | 11.4                              | 7.3                                       | 8.89            |
| East South Central .....                               | 2.4                            | 57.9                      | 283                    | 13.2                              | 6.4                                       | 10.06           |
| West South Central .....                               | 5.9                            | 45.9                      | 220                    | 13.9                              | 6.7                                       | 5.88            |
| West .....   | 11.8                           | 41.3                      | 200                    | 10.1                              | 4.9                                       | 3.30            |
| Mountain .....   | 3.3                            | 67.1                      | 297                    | 9.7                               | 4.3                                       | 4.53            |
| Pacific .....  | 8.5                            | 31.4                      | 163                    | 10.3                              | 5.4                                       | 4.12            |
| <b>Metropolitan Status</b>                             |                                |                           |                        |                                   |   |                 |
| Metropolitan .....                                     | 41.9                           | 66.2                      | 356                    | 10.0                              | 5.4                                       | 2.21            |
| Central City .....                                     | 19.5                           | 66.4                      | 356                    | 11.3                              | 6.0                                       | 2.85            |
| Outside Central City .....                             | 22.3                           | 66.0                      | 356                    | 9.1                               | 4.9                                       | 2.82            |
| Nonmetropolitan .....                                  | 8.1                            | 70.5                      | 356                    | 10.1                              | 5.1                                       | 5.13            |
| <b>Climate Zone</b>                                    |                                |                           |                        |                                   |   |                 |
| Under 2,000 CDD and--                                  |                                |                           |                        |                                   |   |                 |
| Over 7,000 HDD .....                                   | 3.9                            | 85.2                      | 427                    | 7.2                               | 3.6                                       | 4.34            |
| 5,500 to 7,000 HDD .....                               | 17.7                           | 88.3                      | 443                    | 9.2                               | 4.6                                       | 2.81            |
| 4,000 to 5,499 HDD .....                               | 10.2                           | 74.8                      | 441                    | 9.8                               | 5.8                                       | 4.63            |
| Under 4,000 HDD .....                                  | 10.6                           | 37.1                      | 210                    | 12.4                              | 7.0                                       | 5.25            |
| 2,000 CDD or More and --                               |                                |                           |                        |                                   |   |                 |
| Under 4,000 HDD .....                                  | 7.6                            | 38.5                      | 206                    | 14.3                              | 7.7                                       | 6.05            |
| <b>Housing Structure by Status of Unit</b>             |                                |                           |                        |                                   |   |                 |
| Single-Family Detached .....                           | 31.2                           | 74.5                      | 391                    | 9.7                               | 5.1                                       | 2.49            |
| Owned .....  | 26.7                           | 76.0                      | 400                    | 9.2                               | 4.9                                       | 2.63            |
| Rented .....   | 4.5                            | 65.5                      | 340                    | 13.5                              | 7.0                                       | 4.96            |
| Single-Family Attached .....                           | 3.1                            | 65.7                      | 385                    | 8.4                               | 4.9                                       | 10.80           |
| Owned .....  | 2.3                            | 71.1                      | 422                    | 7.9                               | 4.7                                       | 11.22           |
| Rented .....   | .8                             | 51.1                      | 284                    | 10.5                              | 5.8                                       | 18.88           |
| Building of 2 to 4 Units .....                         | 6.7                            | 62.3                      | 341                    | 12.4                              | 6.8                                       | 4.44            |
| Owned .....  | 1.2                            | 87.1                      | 480                    | 10.3                              | 5.7                                       | 10.16           |
| Rented .....   | 5.4                            | 56.6                      | 309                    | 13.2                              | 7.2                                       | 4.93            |
| Building of 5 or More Units .....                      | 7.3                            | 42.6                      | 228                    | 12.1                              | 6.5                                       | 5.80            |
| Owned .....  | .3                             | 55.2                      | 282                    | 7.8                               | 4.0                                       | 28.06           |
| Rented .....   | 7.0                            | 42.0                      | 225                    | 12.5                              | 6.7                                       | 6.02            |
| Mobile Home .....                                      | 1.7                            | 51.9                      | 269                    | 13.3                              | 6.9                                       | 7.73            |
| Owned .....  | 1.4                            | 52.6                      | 271                    | 12.9                              | 6.6                                       | 8.59            |
| Rented .....   | .3                             | 48.1                      | 261                    | 15.6                              | 8.5                                       | 16.34           |
| <b>Measured Heated Area of Residence (square feet)</b> |                                |                           |                        |                                   |   |                 |
| Fewer than 600 .....                                   | 3.7                            | 41.1                      | 221                    | 20.6                              | 11.1                                      | 5.40            |
| 600 to 999 .....                                       | 13.1                           | 50.5                      | 269                    | 14.8                              | 7.9                                       | 3.29            |
| 1,000 to 1,599 .....                                   | 13.4                           | 58.9                      | 313                    | 12.1                              | 6.4                                       | 2.91            |
| 1,600 to 1,999 .....                                   | 6.6                            | 75.5                      | 407                    | 9.4                               | 5.1                                       | 3.43            |
| 2,000 to 2,399 .....                                   | 5.4                            | 81.9                      | 438                    | 8.2                               | 4.4                                       | 4.22            |
| 2,400 to 2,999 .....                                   | 4.9                            | 96.5                      | 516                    | 7.6                               | 4.1                                       | 4.44            |
| 3,000 or More .....                                    | 2.9                            | 113.4                     | 586                    | 5.5                               | 2.9                                       | 4.48            |

See footnotes at end of table.

**Table 28. Space-Heating Natural Gas Consumption and Expenditures per Household when Natural Gas was the Main Heating Fuel, 1987 (Continued)**

| Household Characteristics                       | Number of Households (million) | Consumption (million Btu) | Expenditures (dollars) | Heating Intensity                 |   | RSE Row Factors |
|---|--------------------------------|---------------------------|------------------------|-----------------------------------|---|-----------------|
|   |                                |                           |                        | Consumption (Btu/hdd*square foot) | Expenditures (cents/hdd*1000 square feet) |                 |
|   | RSE Column Factors             | 1.669                     | 0.927                  | 0.943                             | 0.773                                     | 0.887           |
| <b>Year of Construction</b>                     |                                |                           |                        |                                   |   |                 |
| 1939 or Before .....                            | 12.9                           | 86.9                      | 466                    | 11.3                              | 6.1                                       | 3.50            |
| 1940 to 1949 .....                              | 5.2                            | 64.7                      | 357                    | 11.0                              | 6.1                                       | 4.48            |
| 1950 to 1959 .....                              | 8.4                            | 63.7                      | 336                    | 10.9                              | 5.8                                       | 3.72            |
| 1960 to 1969 .....                              | 10.8                           | 56.9                      | 311                    | 9.7                               | 5.3                                       | 4.41            |
| 1970 to 1974 .....                              | 5.2                            | 63.1                      | 323                    | 8.7                               | 4.4                                       | 4.85            |
| 1975 to 1979 .....                              | 3.7                            | 60.2                      | 299                    | 7.9                               | 3.9                                       | 6.61            |
| 1980 to 1984 .....                              | 2.6                            | 47.6                      | 251                    | 7.1                               | 3.8                                       | 10.15           |
| 1985 or After .....                             | 1.1                            | 53.6                      | 277                    | 7.1                               | 3.7                                       | 12.69           |
| <b>1987 Family Income</b>                       |                                |                           |                        |                                   |   |                 |
| Less than \$5,000 .....                         | 3.2                            | 65.7                      | 351                    | 15.5                              | 8.3                                       | 5.91            |
| \$5,000 to \$9,999 .....                        | 6.6                            | 61.4                      | 320                    | 12.7                              | 6.6                                       | 4.11            |
| \$10,000 to \$14,999 .....                      | 7.0                            | 62.5                      | 329                    | 11.8                              | 6.2                                       | 3.76            |
| \$15,000 to \$19,999 .....                      | 5.0                            | 61.9                      | 328                    | 10.3                              | 5.5                                       | 4.25            |
| \$20,000 to \$24,999 .....                      | 4.4                            | 63.7                      | 328                    | 10.1                              | 5.2                                       | 3.71            |
| \$25,000 to \$34,999 .....                      | 8.6                            | 65.3                      | 351                    | 9.3                               | 5.0                                       | 3.76            |
| \$35,000 to \$49,999 .....                      | 7.4                            | 72.0                      | 387                    | 8.9                               | 4.8                                       | 4.37            |
| \$50,000 or More .....                          | 7.8                            | 78.0                      | 424                    | 8.5                               | 4.6                                       | 3.61            |
| <b>Below 100 Percent of Poverty Line</b>        |                                |                           |                        |                                   |   |                 |
| Below 100 Percent of Poverty Line .....         | 6.4                            | 61.9                      | 330                    | 14.5                              | 7.7                                       | 4.43            |
| <b>Below 125 Percent of Poverty Line</b>        |                                |                           |                        |                                   |   |                 |
| Below 125 Percent of Poverty Line .....         | 10.1                           | 62.7                      | 332                    | 13.6                              | 7.2                                       | 3.75            |
| <b>Race of Householder</b>                      |                                |                           |                        |                                   |   |                 |
| White .....                                     | 40.9                           | 67.9                      | 357                    | 9.4                               | 4.9                                       | 2.10            |
| Black .....                                     | 7.4                            | 66.4                      | 382                    | 15.2                              | 8.7                                       | 4.50            |
| Other .....                                     | 1.8                            | 45.5                      | 229                    | 9.6                               | 4.9                                       | 8.42            |
| <b>Householder of Hispanic Descent</b>          |                                |                           |                        |                                   |   |                 |
| Yes .....                                       | 2.9                            | 46.1                      | 242                    | 11.8                              | 6.2                                       | 6.67            |
| No .....  | 47.1                           | 68.2                      | 363                    | 9.9                               | 5.3                                       | 2.09            |
| <b>Age of Householder</b>                       |                                |                           |                        |                                   |   |                 |
| Under 25 Years .....                            | 3.5                            | 51.8                      | 274                    | 12.4                              | 6.6                                       | 4.47            |
| 25 to 34 Years .....                            | 12.1                           | 61.0                      | 323                    | 10.6                              | 5.6                                       | 3.53            |
| 35 to 44 Years .....                            | 9.5                            | 66.5                      | 349                    | 9.1                               | 4.8                                       | 3.41            |
| 45 to 59 Years .....                            | 10.4                           | 74.0                      | 393                    | 9.8                               | 5.2                                       | 3.21            |
| 60 Years and Over .....                         | 14.6                           | 70.6                      | 381                    | 10.2                              | 5.5                                       | 2.90            |
| <b>Household Size</b>                           |                                |                           |                        |                                   |   |                 |
| 1 Person .....                                  | 12.0                           | 63.4                      | 333                    | 11.7                              | 6.1                                       | 3.72            |
| 2 Persons .....                                 | 16.5                           | 65.8                      | 350                    | 9.7                               | 5.2                                       | 2.76            |
| 3 Persons .....                                 | 8.6                            | 66.0                      | 354                    | 10.1                              | 5.4                                       | 3.18            |
| 4 Persons .....                                 | 7.5                            | 73.4                      | 390                    | 9.6                               | 5.1                                       | 3.98            |
| 5 Persons .....                                 | 3.6                            | 69.6                      | 379                    | 9.5                               | 5.2                                       | 5.32            |
| 6 or More Persons .....                         | 1.7                            | 72.6                      | 393                    | 8.7                               | 4.7                                       | 8.02            |
| <b>All Gas Paid by Household</b>                |                                |                           |                        |                                   |   |                 |
| Yes .....                                       | 40.0                           | 70.6                      | 374                    | 9.8                               | 5.2                                       | 2.42            |
| Budget Plan .....                               | 7.6                            | 90.7                      | 493                    | 8.9                               | 4.8                                       | 4.01            |
| No Budget Plan .....                            | 32.4                           | 65.9                      | 346                    | 10.0                              | 5.3                                       | 2.56            |
| No .....  | 10.0                           | 52.0                      | 283                    | 12.5                              | 6.8                                       | 4.58            |
| <b>Main Heating Equipment Using Natural Gas</b> |                                |                           |                        |                                   |   |                 |
| Central Warm Air Furnace .....                  | 31.6                           | 70.4                      | 366                    | 9.3                               | 4.8                                       | 2.43            |
| Steam or Hot-Water System .....                 | 9.2                            | 80.8                      | 463                    | 10.3                              | 5.9                                       | 4.24            |
| Floor, Wall or Pipeless Furnace .....           | 5.1                            | 37.0                      | 188                    | 12.6                              | 6.4                                       | 5.45            |
| Room Heater/Other .....                         | 4.0                            | 45.2                      | 249                    | 15.0                              | 8.3                                       | 6.07            |

See footnotes at end of table.

**Table 28. Space-Heating Natural Gas Consumption and Expenditures per Household when Natural Gas was the Main Heating Fuel, 1987 (Continued)**

| Household Characteristics                                 | Number of Households (million) | Consumption (million Btu) | Expenditures (dollars) | Heating Intensity                 |   | RSE Row Factors |
|---|--------------------------------|---------------------------|------------------------|-----------------------------------|---|-----------------|
|   |                                |                           |                        | Consumption (Btu/hdd*square foot) | Expenditures (cents/hdd*1000 square feet) |                 |
|   |                                |                           |                        | 0.773                             | 0.887                                     |                 |
| RSE Column Factors:                                       | 1.669                          | 0.927                     | 0.943                  |                                   |   |                 |
| <b>Secondary Heating Fuel (more than one may be used)</b> |                                |                           |                        |                                   |   |                 |
| Yes .....   | 18.3                           | 70.6                      | 370                    | 9.3                               | 4.9                                       | 2.93            |
| Wood .....  | 10.2                           | 75.0                      | 389                    | 8.4                               | 4.4                                       | 3.75            |
| Electricity .....   | 6.7                            | 64.8                      | 343                    | 10.3                              | 5.4                                       | 4.13            |
| Fuel Oil/Kerosene .....                                   | 2.0                            | 80.4                      | 442                    | 10.1                              | 5.5                                       | 7.65            |
| Other .....   | .3                             | 65.6                      | 336                    | 6.6                               | 3.4                                       | 9.50            |
| No .....  | 31.7                           | 64.8                      | 348                    | 10.6                              | 5.7                                       | 2.33            |

Notes: • End-use values are statistical estimates based on the 1987 RECS. • See Appendix B for methodology of end-use estimates.  
 • Btu/hdd\*square foot and cents/hdd\*1000 square feet are the Btu or cents per heating degree-day and square foot of the housing unit. They are values that have been adjusted for the effects of the weather and size of the residence. See Appendix C for a comparison of the two methods used to calculate the values. • To obtain a Relative Standard Error (RSE) percentage for any table cell, multiply the cells corresponding column and row factors. • Because of rounding, data may not sum to totals. • See "Glossary" for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use Division, Forms EIA-457 A, B, C, F of the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).

**Table 29. Space-Heating Electricity Consumption and Expenditures per Household when Electricity was the Main Heating Fuel, 1987**

| Household Characteristics                              | Number of Households (million) | Consumption (million Btu) | Expenditures (dollars) | Heating Intensity                 |   | RSE Row Factors |
|--|--------------------------------|---------------------------|------------------------|-----------------------------------|---|-----------------|
|  |                                |                           |                        | Consumption (Btu/hdd*square foot) | Expenditures (cents/hdd*1000 square feet) |                 |
| RSE Column Factors                                     | 1.580                          | 1.157                     | 1.064                  | 0.732                             | 0.702                                     |                 |
| <b>Total U.S. Households</b>                           | 17.9                           | 14.5                      | 282                    | 3.4                               | 6.7                                       | 4.35            |
| <b>Census Region and Division</b>                      |                                |                           |                        |                                   |   |                 |
| Northeast  | 2.1                            | 21.0                      | 492                    | 2.5                               | 5.9                                       | 7.86            |
| New England  | .4                             | 21.2                      | 498                    | 3.1                               | 7.3                                       | 11.09           |
| Middle Atlantic  | 1.7                            | 21.0                      | 490                    | 2.4                               | 5.6                                       | 9.15            |
| Midwest  | 1.5                            | 27.6                      | 519                    | 3.3                               | 6.2                                       | 7.82            |
| East North Central                                     | 1.1                            | 28.8                      | 551                    | 3.5                               | 6.7                                       | 10.36           |
| West North Central                                     | .4                             | 24.5                      | 435                    | 2.8                               | 5.0                                       | 11.31           |
| South  | 10.5                           | 12.0                      | 231                    | 3.9                               | 7.5                                       | 6.03            |
| South Atlantic   | 5.8                            | 11.2                      | 227                    | 3.9                               | 7.9                                       | 9.71            |
| East South Central                                     | 2.2                            | 18.0                      | 304                    | 3.9                               | 6.6                                       | 8.20            |
| West South Central                                     | 2.5                            | 8.8                       | 179                    | 3.8                               | 7.7                                       | 10.77           |
| West   | 3.8                            | 13.0                      | 214                    | 3.4                               | 5.6                                       | 10.52           |
| Mountain   | .7                             | 11.7                      | 217                    | 3.8                               | 7.1                                       | 15.70           |
| Pacific  | 3.1                            | 13.3                      | 214                    | 3.3                               | 5.3                                       | 12.45           |
| <b>Metropolitan Status</b>                             |                                |                           |                        |                                   |   |                 |
| Metropolitan   | 14.5                           | 12.8                      | 258                    | 3.3                               | 6.7                                       | 5.26            |
| Central City   | 5.6                            | 11.4                      | 221                    | 3.6                               | 6.9                                       | 6.78            |
| Outside Central City                                   | 8.9                            | 13.7                      | 280                    | 3.2                               | 6.6                                       | 6.55            |
| Nonmetropolitan  | 3.4                            | 21.8                      | 385                    | 3.6                               | 6.4                                       | 6.45            |
| <b>Climate Zone</b>                                    |                                |                           |                        |                                   |   |                 |
| Under 2,000 CDD and --                                 |                                |                           |                        |                                   |   |                 |
| Over 7,000 HDD   | .6                             | 27.3                      | 537                    | 3.2                               | 6.4                                       | 15.45           |
| 5,500 to 7,000 HDD                                     | 2.6                            | 25.8                      | 479                    | 3.3                               | 6.1                                       | 7.41            |
| 4,000 to 5,499 HDD                                     | 4.2                            | 19.5                      | 365                    | 2.9                               | 5.4                                       | 6.61            |
| Under 4,000 HDD  | 4.0                            | 12.4                      | 247                    | 3.7                               | 7.4                                       | 8.21            |
| 2,000 CDD or More and --                               |                                |                           |                        |                                   |   |                 |
| Under 4,000 HDD  | 6.4                            | 6.8                       | 142                    | 4.4                               | 9.3                                       | 9.07            |
| <b>Housing Structure by Status of Unit</b>             |                                |                           |                        |                                   |   |                 |
| Single-Family Detached                                 | 8.4                            | 19.4                      | 367                    | 3.5                               | 6.6                                       | 4.93            |
| Owned  | 7.6                            | 19.3                      | 367                    | 3.4                               | 6.5                                       | 5.05            |
| Rented   | .8                             | 20.3                      | 360                    | 5.0                               | 8.8                                       | 14.36           |
| Single-Family Attached                                 | 1.5                            | 16.8                      | 336                    | 2.9                               | 5.7                                       | 18.47           |
| Owned  | 1.0                            | 16.0                      | 333                    | 2.5                               | 5.3                                       | 22.43           |
| Rented   | .5                             | 18.4                      | 344                    | 3.6                               | 6.8                                       | 19.07           |
| Building of 2 to 4 Units                               | 1.5                            | 13.7                      | 264                    | 4.6                               | 8.8                                       | 11.59           |
| Rented   | 1.4                            | 13.9                      | 265                    | 4.5                               | 8.7                                       | 10.32           |
| Building of 5 or More Units                            | 5.5                            | 6.5                       | 138                    | 2.6                               | 5.5                                       | 8.27            |
| Owned  | .5                             | 6.1                       | 145                    | 1.8                               | 4.2                                       | 26.52           |
| Rented   | 5.0                            | 6.5                       | 137                    | 2.8                               | 5.8                                       | 7.55            |
| Mobile Home  | 1.0                            | 16.7                      | 306                    | 5.6                               | 10.3                                      | 10.24           |
| Owned  | .9                             | 17.8                      | 322                    | 5.3                               | 9.6                                       | 10.50           |
| <b>Measured Heated Area of Residence (square feet)</b> |                                |                           |                        |                                   |   |                 |
| Fewer than 600   | 2.0                            | 7.7                       | 162                    | 4.6                               | 9.8                                       | 7.93            |
| 600 to 999   | 5.3                            | 10.5                      | 204                    | 4.2                               | 8.2                                       | 7.81            |
| 1,000 to 1,599   | 6.0                            | 14.2                      | 270                    | 3.9                               | 7.4                                       | 6.32            |
| 1,600 to 1,999   | 2.0                            | 19.7                      | 381                    | 3.2                               | 6.1                                       | 7.88            |
| 2,000 to 2,399   | 1.3                            | 20.0                      | 404                    | 2.6                               | 5.2                                       | 9.17            |
| 2,400 to 2,999   | .8                             | 29.6                      | 548                    | 2.5                               | 4.7                                       | 10.73           |
| 3,000 or More  | .7                             | 26.2                      | 511                    | 2.1                               | 4.2                                       | 10.85           |
| <b>Year of Construction</b>                            |                                |                           |                        |                                   |   |                 |
| 1939 or Before   | 1.1                            | 17.6                      | 358                    | 3.9                               | 8.0                                       | 14.11           |
| 1940 to 1949   | .6                             | 16.4                      | 314                    | 4.6                               | 8.9                                       | 12.54           |
| 1950 to 1959   | 1.1                            | 15.4                      | 282                    | 4.6                               | 8.4                                       | 11.02           |
| 1960 to 1969   | 2.5                            | 16.7                      | 308                    | 3.9                               | 7.1                                       | 8.51            |
| 1970 to 1974   | 2.4                            | 14.9                      | 282                    | 3.9                               | 7.4                                       | 9.32            |
| 1975 to 1979   | 4.6                            | 15.6                      | 302                    | 3.3                               | 6.3                                       | 8.82            |

See footnotes at end of table.

END-USE / ELECTRIC HEATING

**Table 29. Space-Heating Electricity Consumption and Expenditures per Household when Electricity was the Main Heating Fuel, 1987 (Continued)**

| Household Characteristics                       | Number of Households (million) | Consumption (million Btu) | Expenditures (dollars) | Heating Intensity                 |   | RSE Row Factors |
|---|--------------------------------|---------------------------|------------------------|-----------------------------------|---|-----------------|
|   |                                |                           |                        | Consumption (Btu/hdd*square foot) | Expenditures (cents/hdd*1000 square feet) |                 |
| RSE Column Factors                              | 1.580                          | 1.157                     | 1.064                  | 0.732                             | 0.702                                     |                 |
| <b>Year of Construction</b>                     |                                |                           |                        |                                   |   |                 |
| 1980 to 1984 .....                              | 3.4                            | 11.5                      | 226                    | 2.9                               | 5.6                                       | 7.98            |
| 1985 or After .....                             | 2.1                            | 11.6                      | 244                    | 2.8                               | 5.8                                       | 12.72           |
| <b>1987 Family Income</b>                       |                                |                           |                        |                                   |   |                 |
| Less than \$5,000 .....                         | 1.2                            | 12.2                      | 231                    | 5.0                               | 9.5                                       | 14.36           |
| \$5,000 to \$9,999 .....                        | 1.8                            | 14.5                      | 270                    | 4.1                               | 7.7                                       | 10.46           |
| \$10,000 to \$14,999 .....                      | 2.0                            | 12.2                      | 224                    | 4.3                               | 7.9                                       | 7.47            |
| \$15,000 to \$19,999 .....                      | 1.8                            | 12.1                      | 238                    | 3.5                               | 6.8                                       | 10.82           |
| \$20,000 to \$24,999 .....                      | 1.8                            | 15.7                      | 284                    | 3.7                               | 6.7                                       | 8.32            |
| \$25,000 to \$34,999 .....                      | 3.5                            | 14.1                      | 280                    | 3.3                               | 6.5                                       | 6.93            |
| \$35,000 to \$49,999 .....                      | 3.1                            | 15.1                      | 297                    | 3.2                               | 6.2                                       | 7.38            |
| \$50,000 or More .....                          | 2.7                            | 18.0                      | 363                    | 3.0                               | 6.0                                       | 8.20            |
| <b>Below 100 Percent of Poverty Line</b>        |                                |                           |                        |                                   |   |                 |
| .....   | 2.0                            | 13.9                      | 261                    | 5.0                               | 9.4                                       | 10.95           |
| <b>Below 125 Percent of Poverty Line</b>        |                                |                           |                        |                                   |   |                 |
| .....   | 3.0                            | 13.8                      | 256                    | 4.6                               | 8.4                                       | 9.23            |
| <b>Race of Householder</b>                      |                                |                           |                        |                                   |   |                 |
| White .....                                     | 16.0                           | 14.7                      | 283                    | 3.4                               | 6.6                                       | 4.55            |
| Black .....                                     | 1.4                            | 13.7                      | 272                    | 3.9                               | 7.7                                       | 11.33           |
| Other .....                                     | .5                             | 12.3                      | 253                    | 3.4                               | 7.0                                       | 17.79           |
| <b>Householder of Hispanic Descent</b>          |                                |                           |                        |                                   |   |                 |
| Yes .....                                       | .9                             | 10.0                      | 222                    | 3.1                               | 6.9                                       | 17.10           |
| No .....  | 17.0                           | 14.8                      | 285                    | 3.5                               | 6.7                                       | 4.48            |
| <b>Age of Householder</b>                       |                                |                           |                        |                                   |   |                 |
| Under 25 Years .....                            | 2.0                            | 9.9                       | 205                    | 3.4                               | 7.1                                       | 11.91           |
| 25 to 34 Years .....                            | 4.7                            | 12.9                      | 255                    | 3.4                               | 6.8                                       | 5.42            |
| 35 to 44 Years .....                            | 4.1                            | 15.4                      | 302                    | 3.4                               | 6.6                                       | 6.55            |
| 45 to 59 Years .....                            | 3.4                            | 16.3                      | 309                    | 3.3                               | 6.2                                       | 7.20            |
| 60 Years and Over .....                         | 3.7                            | 16.6                      | 310                    | 3.7                               | 6.9                                       | 7.51            |
| <b>Household Size</b>                           |                                |                           |                        |                                   |   |                 |
| 1 Person .....                                  | 4.9                            | 12.2                      | 236                    | 3.5                               | 6.7                                       | 7.19            |
| 2 Persons .....                                 | 6.6                            | 13.7                      | 266                    | 3.4                               | 6.5                                       | 5.50            |
| 3 Persons .....                                 | 2.9                            | 16.4                      | 321                    | 3.7                               | 7.2                                       | 7.17            |
| 4 Persons .....                                 | 2.4                            | 16.9                      | 329                    | 3.4                               | 6.7                                       | 7.99            |
| 5 Persons .....                                 | .7                             | 20.1                      | 382                    | 3.6                               | 6.8                                       | 12.28           |
| 6 or More Persons .....                         | .4                             | 19.0                      | 357                    | 3.9                               | 7.4                                       | 17.94           |
| <b>All Electricity Paid by Household</b>        |                                |                           |                        |                                   |   |                 |
| Yes .....                                       | 16.1                           | 15.0                      | 289                    | 3.4                               | 6.6                                       | 4.45            |
| Budget Plan .....                               | 1.3                            | 23.3                      | 440                    | 3.3                               | 6.3                                       | 8.15            |
| No Budget Plan .....                            | 14.8                           | 14.3                      | 276                    | 3.4                               | 6.6                                       | 4.71            |
| No .....  | 1.8                            | 10.2                      | 212                    | 3.8                               | 7.9                                       | 12.68           |
| <b>All-Electric Home</b>                        |                                |                           |                        |                                   |   |                 |
| Yes .....                                       | 15.0                           | 15.9                      | 305                    | 3.4                               | 6.5                                       | 4.17            |
| No .....  | 2.9                            | 7.6                       | 165                    | 3.3                               | 7.2                                       | 11.78           |
| <b>Main Heating Equipment Using Electricity</b> |                                |                           |                        |                                   |   |                 |
| Central Warm Air Furnace .....                  | 6.9                            | 12.8                      | 242                    | 4.0                               | 7.5                                       | 7.72            |
| Built-In Electric Units .....                   | 5.4                            | 17.5                      | 334                    | 3.5                               | 6.8                                       | 6.09            |

See footnotes at end of table.

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**Table 29. Space-Heating Electricity Consumption and Expenditures per Household when Electricity was the Main Heating Fuel, 1987 (Continued)**

| Household Characteristics                                     | Number of Households (million) | Consumption (million Btu) | Expenditures (dollars) | Heating Intensity                 |   | RSE Row Factors |
|---|--------------------------------|---------------------------|------------------------|-----------------------------------|---|-----------------|
|   |                                |                           |                        | Consumption (Btu/hdd*square foot) | Expenditures (cents/hdd*1000 square feet) |                 |
| RSE Column Factors  | 1.680                          | 1.157                     | 1.064                  | 0.732                             | 0.702                                     |                 |
| <b>Main Heating Equipment Using Electricity</b>               |                                |                           |                        |                                   |   |                 |
| Heat Pump .....   | 4.5                            | 14.4                      | 291                    | 2.8                               | 5.7                                       | 6.41            |
| Other .....   | 1.1                            | 11.8                      | 236                    | 4.5                               | 9.0                                       | 11.10           |
| <b>Secondary Heating Fuel<br/>(more than one may be used)</b> |                                |                           |                        |                                   |   |                 |
| Yes .....   | 7.4                            | 17.2                      | 324                    | 3.3                               | 6.1                                       | 6.26            |
| Wood .....  | 5.0                            | 18.8                      | 350                    | 3.2                               | 5.9                                       | 7.66            |
| Natural Gas .....   | .5                             | 9.7                       | 212                    | 2.9                               | 6.4                                       | 28.49           |
| Fuel Oil/Kerosene .....                                       | 1.2                            | 18.6                      | 349                    | 3.1                               | 5.8                                       | 7.33            |
| Other .....   | .2                             | 19.0                      | 422                    | 2.4                               | 5.4                                       | 26.80           |
| No .....  | 10.5                           | 12.7                      | 252                    | 3.6                               | 7.2                                       | 4.81            |

Notes: • End-use values are statistical estimates based on the 1987 RECS. • See Appendix B for methodology of end-use estimates.  
 • Btu/hdd\*square foot and cents/hdd\*1000 square feet are the Btu or cents per heating degree-day and square foot of the housing unit. They are values that have been adjusted for the effects of the weather and size of the residence. See Appendix C for a comparison of the two methods used to calculate the values. • Electricity consumption is based on site electricity. No adjustment is made for primary fuels consumed to produce electricity. • To obtain a Relative Standard Error (RSE) percentage for any table cell, multiply the cell's corresponding column and row factors. • Because of rounding, data may not sum to totals. • See "Glossary" for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use Division, Forms EIA-457 A, B, C, E of the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).

**Table 30. Space-Heating Fuel Oil, Kerosene and Liquefied Petroleum Gas Consumption and Expenditures per Household by Main Heating Fuel, 1987**

| Household Characteristics                              | Fuel Oil or Kerosene as Main Heating Fuel |                           |                        |                           |                                   | Liquefied Petroleum Gas as Main Heating Fuel |                           |                        |                           |                                   | RSE Row Factors |  |
|--|---|---------------------------|------------------------|---------------------------|-----------------------------------|--|---------------------------|------------------------|---------------------------|-----------------------------------|-----------------|--|
|  | Number of Households (million)            | Consumption (million Btu) | Expenditures (dollars) | Heating Intensity         |                                   | Number of Households (million)               | Consumption (million Btu) | Expenditures (dollars) | Heating Intensity         |                                   |                 |  |
|  |   |                           |                        | Consumption (Btu/hdd*sqf) | Expenditures (cents/hdd*1000 sqf) |  |                           |                        | Consumption (Btu/hdd*sqf) | Expenditures (cents/hdd*1000 sqf) |                 |  |
| RSE Column Factors                                     | 1.346                                     | 0.663                     | 0.709                  | 0.716                     | 0.743                             | 2.217  | 1.086                     | 1.039                  | 0.997                     | 1.191                             |                 |  |
| <b>Total U.S. Households</b>                           | 12.2                                      | 78.6                      | 461                    | 9.1                       | 5.3                               | 4.1  | 49.6                      | 407                    | 9.5                       | 7.8                               | 4.54            |  |
| <b>Census Region and Division</b>                      |   |                           |                        |                           |                                   |  |                           |                        |                           |                                   |                 |  |
| Northeast  | 8.0                                       | 85.0                      | 494                    | 9.4                       | 5.4                               | Q  | Q                         | Q                      | Q                         | Q                                 | 5.22            |  |
| New England  | 2.4                                       | 87.4                      | 519                    | 7.4                       | 4.4                               | Q  | Q                         | Q                      | Q                         | Q                                 | 5.60            |  |
| Middle Atlantic  | 5.6                                       | 83.9                      | 483                    | 10.4                      | 6.0                               | Q  | Q                         | Q                      | Q                         | Q                                 | 7.26            |  |
| Midwest  | 1.5                                       | 78.9                      | 462                    | 6.2                       | 3.6                               | 1.3  | 69.4                      | 506                    | 7.6                       | 5.6                               | 6.90            |  |
| East North Central                                     | 1.2                                       | 81.4                      | 480                    | 6.3                       | 3.7                               | .9   | 69.9                      | 553                    | 7.1                       | 5.6                               | 8.98            |  |
| West North Central                                     | .3  | 69.3                      | 394                    | 5.7                       | 3.3                               | .5   | 68.4                      | 421                    | 8.8                       | 5.4                               | 8.93            |  |
| South  | 2.3                                       | 59.9                      | 372                    | 12.6                      | 7.8                               | 2.1  | 36.3                      | 325                    | 12.3                      | 11.0                              | 9.10            |  |
| South Atlantic   | 2.0                                       | 60.3                      | 375                    | 12.6                      | 7.8                               | 1.1  | 32.5                      | 326                    | 12.9                      | 13.0                              | 12.61           |  |
| East South Central                                     | .3  | 60.3                      | 373                    | 12.6                      | 7.8                               | .5   | 46.2                      | 411                    | 12.1                      | 10.8                              | 13.58           |  |
| West South Central                                     | Q   | Q                         | Q                      | Q                         | Q                                 | Q  | 33.9                      | 232                    | 11.3                      | 7.7                               | 16.99           |  |
| West   | Q   | 51.0                      | 288                    | 5.4                       | 3.1                               | .6   | 53.2                      | 451                    | 8.8                       | 7.4                               | 20.64           |  |
| Mountain   | Q   | Q                         | Q                      | Q                         | Q                                 | Q  | 76.1                      | 468                    | 8.5                       | Q                                 | 19.59           |  |
| Pacific  | Q   | 47.4                      | 274                    | 5.0                       | 2.9                               | .4   | 41.9                      | 443                    | 8.8                       | 9.3                               | 26.35           |  |
| <b>Metropolitan Status</b>                             |   |                           |                        |                           |                                   |  |                           |                        |                           |                                   |                 |  |
| Metropolitan   | 9.4                                       | 80.2                      | 469                    | 9.4                       | 5.5                               | 1.8  | 40.8                      | 364                    | 9.4                       | 8.4                               | 5.87            |  |
| Central City   | 3.7                                       | 68.7                      | 384                    | 11.6                      | 6.5                               | .3   | 26.1                      | 282                    | 14.1                      | Q                                 | 13.81           |  |
| Outside Central City                                   | 5.7                                       | 87.7                      | 524                    | 8.4                       | 5.0                               | 1.5  | 44.0                      | 382                    | 8.8                       | 7.6                               | 7.00            |  |
| Nonmetropolitan  | 2.8                                       | 73.1                      | 436                    | 8.2                       | 4.9                               | 2.3  | 56.6                      | 441                    | 9.6                       | 7.5                               | 8.12            |  |
| <b>Climate Zone</b>                                    |   |                           |                        |                           |                                   |  |                           |                        |                           |                                   |                 |  |
| Under 2,000 CDD and--                                  |   |                           |                        |                           |                                   |  |                           |                        |                           |                                   |                 |  |
| Over 7,000 HDD   | 2.0                                       | 80.8                      | 467                    | 6.1                       | 3.5                               | .8   | 70.5                      | 521                    | 7.8                       | 5.8                               | 8.85            |  |
| 5,500 to 7,000 HDD                                     | 3.7                                       | 92.6                      | 554                    | 8.1                       | 4.8                               | .5   | 67.6                      | 546                    | 7.6                       | 6.1                               | 8.09            |  |
| 4,000 to 5,499 HDD                                     | 5.3                                       | 75.7                      | 434                    | 11.1                      | 6.4                               | .8   | 58.2                      | 452                    | 9.5                       | 7.4                               | 8.26            |  |
| Under 4,000 HDD  | .8  | 51.8                      | 331                    | 15.5                      | 9.9                               | 1.0  | 46.1                      | 418                    | 10.4                      | 9.5                               | 11.98           |  |
| 2,000 CDD or More and --                               |   |                           |                        |                           |                                   |  |                           |                        |                           |                                   |                 |  |
| Under 4,000 HDD  | .3  | Q                         | Q                      | 11.2                      | 8.0                               | 1.1  | 22.6                      | 215                    | 14.0                      | 13.4                              | 23.23           |  |
| <b>Housing Structure by Status of Unit</b>             |   |                           |                        |                           |                                   |  |                           |                        |                           |                                   |                 |  |
| Single-Family Detached                                 | 7.2                                       | 87.0                      | 521                    | 8.0                       | 4.8                               | 2.9  | 55.8                      | 446                    | 8.9                       | 7.1                               | 5.70            |  |
| Owned  | 6.4                                       | 89.4                      | 535                    | 7.9                       | 4.7                               | 2.4  | 58.1                      | 468                    | 8.6                       | 6.9                               | 5.66            |  |
| Rented   | .7  | 66.7                      | 401                    | 9.5                       | 5.7                               | .5   | 44.6                      | 342                    | 10.5                      | 8.0                               | 16.36           |  |
| Single-Family Attached                                 | .7  | 94.7                      | 588                    | 9.0                       | 5.6                               | NA   | NA                        | NA                     | NA                        | NA                                | 16.76           |  |
| Owned  | .6  | 97.1                      | 607                    | 9.0                       | 5.6                               | NA   | NA                        | NA                     | NA                        | NA                                | 22.68           |  |
| Building of 2 to 4 Units                               | 1.5                                       | 74.1                      | 445                    | 11.2                      | 6.7                               | NA   | NA                        | NA                     | NA                        | NA                                | 7.55            |  |
| Owned  | .4  | 97.3                      | 586                    | 9.2                       | 5.5                               | NA   | NA                        | NA                     | NA                        | NA                                | 18.72           |  |
| Rented   | 1.1                                       | 64.9                      | 389                    | 12.8                      | 7.7                               | NA   | NA                        | NA                     | NA                        | NA                                | 8.31            |  |
| Building of 5 or More Units                            | 2.0                                       | 56.6                      | 269                    | 15.4                      | 7.3                               | NA   | NA                        | NA                     | NA                        | NA                                | 7.50            |  |
| Owned  | .2  | 51.7                      | 248                    | 14.7                      | 7.1                               | NA   | NA                        | NA                     | NA                        | NA                                | 30.94           |  |
| Rented   | 1.9                                       | 57.0                      | 270                    | 15.5                      | 7.4                               | NA   | NA                        | NA                     | NA                        | NA                                | 8.32            |  |
| Mobile Home  | .8  | 55.1                      | 350                    | 13.8                      | 8.8                               | 1.2  | 34.9                      | 315                    | 11.9                      | 10.8                              | 10.81           |  |
| Owned  | .6  | 50.7                      | 324                    | 12.2                      | 7.8                               | 1.0  | 36.1                      | 328                    | 11.6                      | 10.5                              | 11.46           |  |
| Rented   | .2  | 69.6                      | 435                    | 20.0                      | 12.5                              | .2   | 29.5                      | 260                    | 14.4                      | 12.7                              | 26.78           |  |
| <b>Measured Heated Area of Residence (square feet)</b> |   |                           |                        |                           |                                   |  |                           |                        |                           |                                   |                 |  |
| Fewer than 600   | 1.3                                       | 58.3                      | 311                    | 22.8                      | 12.2                              | .4   | 41.1                      | 368                    | 22.1                      | 19.7                              | 11.00           |  |
| 600 to 999   | 3.0                                       | 57.6                      | 329                    | 13.9                      | 7.9                               | 1.4  | 33.5                      | 291                    | 12.5                      | 10.8                              | 6.58            |  |
| 1,000 to 1,599   | 2.8                                       | 71.3                      | 429                    | 11.4                      | 6.9                               | 1.3  | 57.3                      | 456                    | 10.5                      | 8.4                               | 6.70            |  |
| 1,600 to 1,999   | 1.5                                       | 83.3                      | 501                    | 8.9                       | 5.3                               | .5   | 44.2                      | 386                    | 6.9                       | 6.0                               | 9.60            |  |
| 2,000 to 2,399   | 1.2                                       | 93.5                      | 565                    | 7.6                       | 4.6                               | .2   | 60.0                      | 576                    | 7.3                       | 7.0                               | 14.62           |  |
| 2,400 to 2,999   | 1.4                                       | 94.9                      | 558                    | 6.0                       | 3.5                               | .2   | 76.8                      | 572                    | 5.8                       | 4.3                               | 8.34            |  |
| 3,000 or More  | 1.1                                       | 136.5                     | 801                    | 5.9                       | 3.5                               | .2   | 105.5                     | 700                    | 5.6                       | 3.7                               | 11.99           |  |

See footnotes at end of table.

**Table 30. Space-Heating Fuel Oil, Kerosene and Liquefied Petroleum Gas Consumption and Expenditures per Household by Main Heating Fuel, 1987 (Continued)**

| Household Characteristics                     | Fuel Oil or Kerosene as Main Heating Fuel |                           |                        |                           |                                   | Liquefied Petroleum Gas as Main Heating Fuel |                           |                        |                           |                                   | RSE Row Factors |  |
|---|---|---------------------------|------------------------|---------------------------|-----------------------------------|--|---------------------------|------------------------|---------------------------|-----------------------------------|-----------------|--|
|   | Number of Households (million)            | Consumption (million Btu) | Expenditures (dollars) | Heating Intensity         |                                   | Number of Households (million)               | Consumption (million Btu) | Expenditures (dollars) | Heating Intensity         |                                   |                 |  |
|   |   |                           |                        | Consumption (Btu/hdd*sqf) | Expenditures (cents/hdd*1000 sqf) |  |                           |                        | Consumption (Btu/hdd*sqf) | Expenditures (cents/hdd*1000 sqf) |                 |  |
| RSE Column Factors                            | 1.345                                     | 0.663                     | 0.709                  | 0.716                     | 0.743                             | 2.217  | 1.086                     | 1.039                  | 0.997                     | 1.191                             |                 |  |
| <b>Year of Construction</b>                   |   |                           |                        |                           |                                   |  |                           |                        |                           |                                   |                 |  |
| 1939 or Before .....                          | 4.7                                       | 89.0                      | 524                    | 9.9                       | 5.9                               | 0.8  | 51.4                      | 353                    | 10.7                      | 7.4                               | 7.94            |  |
| 1940 to 1949 .....                            | 1.4                                       | 74.4                      | 425                    | 9.9                       | 5.7                               | .4   | 57.4                      | 517                    | 11.1                      | 10.0                              | 11.02           |  |
| 1950 to 1959 .....                            | 2.2                                       | 81.3                      | 483                    | 8.9                       | 5.3                               | .6   | 55.8                      | 506                    | 11.5                      | 10.5                              | 10.16           |  |
| 1960 to 1969 .....                            | 1.9                                       | 67.4                      | 384                    | 9.4                       | 5.4                               | .5   | 48.1                      | 383                    | 7.1                       | 5.6                               | 11.40           |  |
| 1970 to 1974 .....                            | .8  | 60.6                      | 367                    | 9.1                       | 5.5                               | .6   | 50.8                      | 443                    | 10.4                      | 9.1                               | 10.63           |  |
| 1975 to 1979 .....                            | .8  | 75.2                      | 458                    | 5.7                       | 3.5                               | .6   | 48.0                      | 389                    | 10.3                      | 8.4                               | 11.63           |  |
| 1980 to 1984 .....                            | .3  | 45.0                      | 258                    | 4.8                       | 2.7                               | .4   | 31.5                      | 242                    | 6.4                       | 4.9                               | 18.17           |  |
| 1985 or After .....                           | Q   | Q                         | Q                      | Q                         | Q                                 | .2   | 50.2                      | 468                    | 7.1                       | 6.6                               | 16.33           |  |
| <b>1987 Family Income</b>                     |   |                           |                        |                           |                                   |  |                           |                        |                           |                                   |                 |  |
| Less than \$5,000 .....                       | .7  | 58.6                      | 334                    | 14.0                      | 8.0                               | .6   | 37.1                      | 331                    | 14.5                      | 12.9                              | 15.00           |  |
| \$5,000 to \$9,999 .....                      | 1.7                                       | 72.5                      | 421                    | 11.9                      | 6.9                               | .6   | 47.8                      | 418                    | 10.8                      | 9.4                               | 10.53           |  |
| \$10,000 to \$14,999 .....                    | 1.8                                       | 72.9                      | 428                    | 10.3                      | 6.0                               | 1.0  | 46.4                      | 375                    | 10.7                      | 8.6                               | 9.67            |  |
| \$15,000 to \$19,999 .....                    | 1.2                                       | 76.1                      | 454                    | 9.9                       | 5.9                               | .4   | 47.4                      | 384                    | 8.7                       | 7.1                               | 10.06           |  |
| \$20,000 to \$24,999 .....                    | 1.3                                       | 65.9                      | 391                    | 8.0                       | 4.7                               | .4   | 56.4                      | 436                    | 7.7                       | 6.0                               | 11.03           |  |
| \$25,000 to \$34,999 .....                    | 2.3                                       | 74.1                      | 430                    | 8.6                       | 5.0                               | .6   | 54.9                      | 453                    | 8.3                       | 6.8                               | 9.22            |  |
| \$35,000 to \$49,999 .....                    | 1.6                                       | 89.5                      | 524                    | 7.7                       | 4.5                               | .3   | 51.3                      | 400                    | 7.0                       | 5.5                               | 10.18           |  |
| \$50,000 or More .....                        | 1.6                                       | 107.8                     | 642                    | 7.9                       | 4.7                               | .2   | 75.1                      | 595                    | 8.4                       | 6.6                               | 12.54           |  |
| <b>Below 100 Percent of Poverty Line</b>      | 1.3                                       | 57.6                      | 329                    | 11.8                      | 6.8                               | 1.0  | 42.0                      | 342                    | 13.3                      | 10.8                              | 10.02           |  |
| <b>Below 125 Percent of Poverty Line</b>      | 2.3                                       | 62.8                      | 362                    | 11.7                      | 6.7                               | 1.3  | 45.7                      | 383                    | 12.9                      | 10.8                              | 8.26            |  |
| <b>Race of Householder</b>                    |   |                           |                        |                           |                                   |  |                           |                        |                           |                                   |                 |  |
| White .....                                   | 10.4                                      | 78.7                      | 464                    | 8.5                       | 5.0                               | 3.6  | 51.1                      | 421                    | 9.1                       | 7.5                               | 4.84            |  |
| Black .....                                   | 1.4                                       | 82.7                      | 480                    | 15.3                      | 8.9                               | .4   | 32.9                      | 289                    | 13.1                      | 11.6                              | 11.30           |  |
| Other .....                                   | .4  | 57.9                      | 304                    | 11.7                      | 6.2                               | Q  | Q                         | Q                      | Q                         | Q                                 | 10.54           |  |
| <b>Householder of Hispanic Descent</b>        |   |                           |                        |                           |                                   |  |                           |                        |                           |                                   |                 |  |
| Yes .....                                     | .7  | 68.8                      | 374                    | 9.9                       | 5.4                               | Q  | Q                         | Q                      | Q                         | Q                                 | 10.49           |  |
| No .....                                      | 11.5                                      | 79.2                      | 467                    | 9.1                       | 5.3                               | 4.0  | 49.5                      | 407                    | 9.4                       | 7.7                               | 4.69            |  |
| <b>Age of Householder</b>                     |   |                           |                        |                           |                                   |  |                           |                        |                           |                                   |                 |  |
| Under 25 Years .....                          | .5  | 67.1                      | 400                    | 12.6                      | 7.5                               | .2   | 33.1                      | 267                    | 8.2                       | 6.6                               | 16.02           |  |
| 25 to 34 Years .....                          | 2.5                                       | 68.4                      | 396                    | 9.1                       | 5.3                               | .8   | 48.1                      | 391                    | 8.9                       | 7.3                               | 7.69            |  |
| 35 to 44 Years .....                          | 2.5                                       | 75.2                      | 443                    | 7.8                       | 4.6                               | .5   | 50.4                      | 361                    | 10.2                      | 7.3                               | 7.64            |  |
| 45 to 59 Years .....                          | 2.3                                       | 88.2                      | 526                    | 8.7                       | 5.2                               | 1.1  | 49.1                      | 412                    | 9.8                       | 8.2                               | 7.52            |  |
| 60 Years and Over .....                       | 4.4                                       | 82.8                      | 483                    | 9.9                       | 5.8                               | 1.6  | 52.4                      | 443                    | 9.5                       | 8.0                               | 7.66            |  |
| <b>Household Size</b>                         |   |                           |                        |                           |                                   |  |                           |                        |                           |                                   |                 |  |
| 1 Person .....                                | 2.9                                       | 67.9                      | 390                    | 12.1                      | 6.9                               | 1.0  | 50.5                      | 430                    | 13.0                      | 11.1                              | 9.28            |  |
| 2 Persons .....                               | 4.1                                       | 82.9                      | 485                    | 8.7                       | 5.1                               | 1.4  | 45.1                      | 372                    | 8.9                       | 7.3                               | 6.82            |  |
| 3 Persons .....                               | 2.2                                       | 79.6                      | 481                    | 9.0                       | 5.4                               | .7   | 47.9                      | 403                    | 9.2                       | 7.8                               | 8.51            |  |
| 4 Persons .....                               | 1.9                                       | 82.6                      | 482                    | 7.9                       | 4.6                               | .6   | 63.5                      | 496                    | 8.3                       | 6.5                               | 8.31            |  |
| 5 Persons .....                               | .8  | 73.9                      | 444                    | 7.9                       | 4.7                               | .2   | 47.2                      | 366                    | 6.7                       | 5.2                               | 14.31           |  |
| 6 or More Persons .....                       | .4  | 95.4                      | 558                    | 8.6                       | 5.0                               | .2   | 47.5                      | 364                    | 9.1                       | 7.0                               | 22.21           |  |
| <b>Fuel Oil or Kerosene Paid by Household</b> |   |                           |                        |                           |                                   |  |                           |                        |                           |                                   |                 |  |
| Yes .....                                     | 9.2                                       | 83.8                      | 505                    | 8.3                       | 5.0                               | 4.1  | 49.6                      | 407                    | 9.5                       | 7.8                               | 4.74            |  |
| Budget Plan .....                             | 1.4                                       | 106.1                     | 647                    | 8.5                       | 5.2                               | NA   | NA                        | NA                     | NA                        | NA                                | 8.03            |  |
| No Budget Plan .....                          | 7.8                                       | 79.8                      | 479                    | 8.3                       | 5.0                               | 4.1  | 49.6                      | 407                    | 9.5                       | 7.8                               | 5.05            |  |
| No .....                                      | 3.0                                       | 62.5                      | 328                    | 14.0                      | 7.4                               | NA   | NA                        | NA                     | NA                        | NA                                | 6.62            |  |

See footnotes at end of table.

**Table 30. Space-Heating Fuel Oil, Kerosene and Liquefied Petroleum Gas Consumption and Expenditures per Household by Main Heating Fuel, 1987 (Continued)**

| Household Characteristics                                     | Fuel Oil or Kerosene as Main Heating Fuel |                           |                        |  |  | Liquefied Petroleum Gas as Main Heating Fuel |                           |                        |  |  | RSE<br>Row<br>Factors |  |
|---|---|---------------------------|------------------------|--|--|--|---------------------------|------------------------|--|--|-----------------------|--|
|   | Number of Households (million)            | Consumption (million Btu) | Expenditures (dollars) | Heating Intensity                      |  | Number of Households (million)               | Consumption (million Btu) | Expenditures (dollars) | Heating Intensity                      |  |                       |  |
|   |   |                           |                        | Consumption (Btu/hdd <sup>a</sup> sqf) | Expenditures (cents/hdd <sup>a</sup> 1000 sqf) |  |                           |                        | Consumption (Btu/hdd <sup>a</sup> sqf) | Expenditures (cents/hdd <sup>a</sup> 1000 sqf) |                       |  |
| RSE Column Factors  | 1.346                                     | 0.663                     | 0.709                  | 0.716                                  | 0.743  | 2.217  | 1.086                     | 1.039                  | 0.997                                  | 1.191  |                       |  |
| <b>Main Heating Equipment Using Fuel Oil</b>                  |   |                           |                        |  |  |  |                           |                        |  |  |                       |  |
| Steam or Hot Water system .....                               | 6.3                                       | 87.6                      | 504                    | 9.9                                    | 5.7  | NA   | NA                        | NA                     | NA                                     | NA   | 5.59                  |  |
| Central Warm Air Furnace .....                                | 4.0                                       | 76.4                      | 452                    | 7.6                                    | 4.5  | NA   | NA                        | NA                     | NA                                     | NA   | 6.80                  |  |
| Other .....   | 1.8                                       | 51.7                      | 334                    | 10.3                                   | 6.7  | 4.1  | 49.6                      | 407                    | 9.5                                    | 7.8  | 7.53                  |  |
| <b>Main Heating Equipment Using LPG</b>                       |   |                           |                        |  |  |  |                           |                        |  |  |                       |  |
| Central Warm Air Furnace .....                                | NA  | NA                        | NA                     | NA                                     | NA   | 2.4  | 56.5                      | 453                    | 8.9                                    | 7.1  | 4.95                  |  |
| Room Heater/Other .....                                       | NA  | NA                        | NA                     | NA                                     | NA   | 1.7  | 39.9                      | 342                    | 10.6                                   | 9.1  | 8.78                  |  |
| <b>Secondary Heating Fuel<br/>(more than one may be used)</b> |   |                           |                        |  |  |  |                           |                        |  |  |                       |  |
| Yes .....   | 5.0                                       | 81.8                      | 486                    | 7.8                                    | 4.6  | 2.3  | 50.7                      | 431                    | 8.8                                    | 7.5  | 5.98                  |  |
| Wood .....  | 2.7                                       | 90.6                      | 540                    | 6.6                                    | 3.9  | 1.0  | 60.1                      | 493                    | 7.5                                    | 6.1  | 7.74                  |  |
| Electricity .....   | 1.7                                       | 75.4                      | 450                    | 10.0                                   | 6.0  | 1.1  | 44.7                      | 393                    | 9.3                                    | 8.2  | 10.30                 |  |
| Natural Gas .....   | .3  | 57.3                      | 318                    | 10.7                                   | 6.0  | NA   | NA                        | NA                     | NA                                     | NA   | 16.49                 |  |
| Fuel Oil/Kerosene .....                                       | .8  | 84.4                      | 501                    | 8.2                                    | 4.9  | .4   | 35.8                      | 322                    | 11.3                                   | 10.2   | 14.72                 |  |
| Other .....   | .2  | 101.3                     | 588                    | 10.0                                   | 5.8  | NA   | NA                        | NA                     | NA                                     | NA   | 29.02                 |  |
| No .....  | 7.2                                       | 76.4                      | 444                    | 10.5                                   | 6.1  | 1.9  | 48.3                      | 379                    | 10.5                                   | 8.2  | 6.06                  |  |

NA Data not available.

<sup>a</sup> Data withheld either because the RSE was greater than 50 percent or fewer than 10 households were sampled.

Notes: • End-use values are statistical estimates based on the 1987 RECS. • See Appendix B for methodology of end-use estimates. • Btu/hdd<sup>a</sup>sqf and cents/hdd<sup>a</sup>1000 sqf are the Btu or cents per heating degree-day and square foot of the housing unit. They are values that have been adjusted for the effects of the weather and size of the residence. See Appendix C for a comparison of the two methods used to calculate the values. • To obtain a Relative Standard Error (RSE) percentage for any table cell, multiply the cell's corresponding column and row factors. • Because of rounding, data may not sum to totals. • See "Glossary" for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use Division, Forms EIA-457 A, B, C, D, G of the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).

**Table 31. Water-Heating Consumption and Expenditures per Household, 1987**

| Household Characteristics                              | Main Water-Heating Fuel        |                           |                        |                                |                           |                        |                                |                           |                        | RSE Row Factors |  |
|--|--------------------------------|---------------------------|------------------------|--------------------------------|---------------------------|------------------------|--------------------------------|---------------------------|------------------------|-----------------|--|
|  | Natural Gas                    |                           |                        | Electricity                    |                           |                        | Liquefied Petroleum Gas        |                           |                        |                 |  |
|  | Number of Households (million) | Consumption (million Btu) | Expenditures (dollars) | Number of Households (million) | Consumption (million Btu) | Expenditures (dollars) | Number of Households (million) | Consumption (million Btu) | Expenditures (dollars) |                 |  |
| RSE Column Factors:                                    | 1.041                          | 0.405                     | 0.482                  | 1.348                          | 0.514                     | 0.543                  | 3.972                          | 1.793                     | 1.838                  |                 |  |
| <b>Total U.S. Households</b>                           | 49.2                           | 22.2                      | 122                    | 32.0                           | 9.8                       | 201                    | 3.0                            | 18.5                      | 163                    | 3.12            |  |
| <b>Census Region and Division</b>                      |                                |                           |                        |                                |                           |                        |                                |                           |                        |                 |  |
| Northeast  | 9.0                            | 23.7                      | 157                    | 4.5                            | 9.3                       | 225                    | .3                             | 16.6                      | 206                    | 8.74            |  |
| New England  | 1.4                            | 24.3                      | 169                    | 1.2                            | 9.1                       | 226                    | .2                             | 18.4                      | 200                    | 10.48           |  |
| Middle Atlantic  | 7.6                            | 23.6                      | 154                    | 3.3                            | 9.4                       | 225                    | Q                              | Q                         | Q                      | 10.82           |  |
| Midwest  | 15.2                           | 21.5                      | 107                    | 5.8                            | 10.3                      | 211                    | 1.1                            | 19.5                      | 149                    | 5.85            |  |
| East North Central                                     | 10.9                           | 22.1                      | 111                    | 4.2                            | 10.8                      | 221                    | .6                             | 20.3                      | 169                    | 8.03            |  |
| West North Central                                     | 4.3                            | 20.2                      | 95                     | 1.6                            | 9.0                       | 185                    | .4                             | 18.2                      | 120                    | 6.88            |  |
| South  | 12.6                           | 21.1                      | 116                    | 16.7                           | 9.8                       | 200                    | 1.2                            | 17.9                      | 156                    | 5.81            |  |
| South Atlantic   | 4.6                            | 21.0                      | 138                    | 10.1                           | 9.6                       | 209                    | .5                             | 16.7                      | 181                    | 7.49            |  |
| East South Central                                     | 1.8                            | 21.3                      | 105                    | 4.1                            | 10.4                      | 180                    | .2                             | 17.1                      | 154                    | 8.79            |  |
| West South Central                                     | 6.2                            | 21.0                      | 102                    | 2.6                            | 9.3                       | 198                    | Q                              | 19.7                      | 127                    | 14.47           |  |
| West   | 12.4                           | 23.2                      | 121                    | 4.9                            | 9.8                       | 170                    | .5                             | 18.9                      | 188                    | 5.99            |  |
| Mountain   | 3.2                            | 22.6                      | 107                    | 1.0                            | 9.2                       | 171                    | Q                              | 20.1                      | 132                    | 11.13           |  |
| Pacific  | 9.2                            | 23.4                      | 126                    | 3.9                            | 10.0                      | 169                    | .4                             | 18.4                      | 210                    | 6.68            |  |
| <b>Metropolitan Status</b>                             |                                |                           |                        |                                |                           |                        |                                |                           |                        |                 |  |
| Metropolitan   | 42.8                           | 22.3                      | 123                    | 20.5                           | 9.5                       | 198                    | 1.4                            | 19.5                      | 178                    | 3.86            |  |
| Central City   | 20.1                           | 22.0                      | 121                    | 7.0                            | 8.8                       | 179                    | .3                             | 17.3                      | 195                    | 6.33            |  |
| Outside Central City                                   | 22.8                           | 22.7                      | 125                    | 13.5                           | 9.9                       | 209                    | 1.2                            | 20.0                      | 174                    | 4.63            |  |
| Nonmetropolitan  | 6.4                            | 21.6                      | 110                    | 11.4                           | 10.3                      | 206                    | 1.6                            | 17.6                      | 150                    | 5.66            |  |
| <b>Climate Zone</b>                                    |                                |                           |                        |                                |                           |                        |                                |                           |                        |                 |  |
| Under 2,000 CDD and -                                  |                                |                           |                        |                                |                           |                        |                                |                           |                        |                 |  |
| Over 7,000 HDD   | 3.2                            | 21.1                      | 105                    | 4.1                            | 9.8                       | 201                    | .7                             | 19.4                      | 161                    | 8.88            |  |
| 5,500 to 7,000 HDD                                     | 17.2                           | 22.8                      | 118                    | 6.2                            | 10.5                      | 210                    | .5                             | 18.2                      | 169                    | 6.60            |  |
| 4,000 to 5,499 HDD                                     | 10.5                           | 22.3                      | 136                    | 7.9                            | 9.7                       | 187                    | .5                             | 17.7                      | 135                    | 7.61            |  |
| Under 4,000 HDD  | 10.6                           | 23.5                      | 129                    | 6.3                            | 10.2                      | 209                    | .7                             | 21.2                      | 177                    | 6.92            |  |
| 2,000 CDD or More and --                               |                                |                           |                        |                                |                           |                        |                                |                           |                        |                 |  |
| Under 4,000 HDD  | 7.8                            | 19.6                      | 108                    | 7.5                            | 9.1                       | 202                    | .6                             | 15.3                      | 168                    | 9.31            |  |
| <b>Housing Structure by Status of Unit</b>             |                                |                           |                        |                                |                           |                        |                                |                           |                        |                 |  |
| Single-Family Detached                                 | 29.0                           | 24.5                      | 132                    | 20.3                           | 10.6                      | 215                    | 2.5                            | 19.0                      | 167                    | 3.63            |  |
| Owned  | 25.0                           | 24.2                      | 130                    | 17.6                           | 10.5                      | 212                    | 2.0                            | 19.9                      | 174                    | 3.93            |  |
| Rented   | 4.1                            | 26.8                      | 141                    | 2.7                            | 11.4                      | 232                    | .5                             | 15.8                      | 143                    | 7.19            |  |
| Single-Family Attached                                 | 3.2                            | 20.7                      | 126                    | 1.9                            | 8.6                       | 179                    | NA                             | NA                        | NA                     | 15.35           |  |
| Owned  | 2.4                            | 21.2                      | 132                    | 1.3                            | 8.2                       | 171                    | NA                             | NA                        | NA                     | 18.40           |  |
| Rented   | .8                             | 19.4                      | 108                    | .6                             | 9.4                       | 193                    | NA                             | NA                        | NA                     | 24.08           |  |
| Building of 2 to 4 Units                               | 7.1                            | 20.1                      | 116                    | 2.2                            | 8.2                       | 167                    | Q                              | Q                         | Q                      | 7.98            |  |
| Owned  | 1.4                            | 20.1                      | 121                    | .3                             | 7.7                       | 158                    | Q                              | Q                         | Q                      | 19.15           |  |
| Rented   | 5.7                            | 20.1                      | 114                    | 1.9                            | 8.3                       | 168                    | NA                             | NA                        | NA                     | 8.89            |  |
| Building of 5 or More Units                            | 8.7                            | 17.0                      | 94                     | 4.2                            | 7.1                       | 151                    | Q                              | Q                         | Q                      | 8.23            |  |
| Owned  | .6                             | 15.6                      | 92                     | .2                             | 6.4                       | 147                    | NA                             | NA                        | NA                     | 34.16           |  |
| Rented   | 8.2                            | 17.1                      | 95                     | 4.0                            | 7.2                       | 152                    | Q                              | Q                         | Q                      | 8.39            |  |
| Mobile Home  | 1.2                            | 20.7                      | 105                    | 3.4                            | 10.2                      | 215                    | .5                             | 16.2                      | 143                    | 8.56            |  |
| Owned  | 1.0                            | 21.4                      | 108                    | 2.8                            | 10.2                      | 212                    | .4                             | 15.8                      | 134                    | 9.62            |  |
| Rented   | .2                             | 17.4                      | 89                     | .6                             | 10.3                      | 228                    | Q                              | Q                         | Q                      | 19.33           |  |
| <b>Measured Heated Area of Residence (square feet)</b> |                                |                           |                        |                                |                           |                        |                                |                           |                        |                 |  |
| Fewer than 600   | 4.4                            | 18.0                      | 102                    | 2.5                            | 8.2                       | 186                    | .3                             | 12.2                      | 141                    | 8.45            |  |
| 600 to 999   | 13.1                           | 19.6                      | 107                    | 8.5                            | 8.9                       | 186                    | .9                             | 16.1                      | 148                    | 4.97            |  |
| 1,000 to 1,599   | 12.5                           | 22.5                      | 122                    | 10.7                           | 9.9                       | 199                    | 1.0                            | 21.3                      | 169                    | 4.83            |  |
| 1,600 to 1,999   | 6.3                            | 22.9                      | 128                    | 4.1                            | 9.9                       | 197                    | .3                             | 17.9                      | 159                    | 6.21            |  |
| 2,000 to 2,399   | 5.3                            | 25.3                      | 138                    | 2.4                            | 11.0                      | 227                    | .2                             | 22.8                      | 216                    | 8.25            |  |
| 2,400 to 2,999   | 4.6                            | 25.7                      | 140                    | 2.2                            | 11.2                      | 229                    | .1                             | 18.6                      | 190                    | 8.43            |  |
| 3,000 or More  | 3.0                            | 25.9                      | 143                    | 1.5                            | 12.6                      | 251                    | .2                             | 23.5                      | 185                    | 9.31            |  |

See footnotes at end of table.

END-USE /WATER HEATING

**Table 31. Water-Heating Consumption and Expenditures per Household, 1987 (Continued)**

| Household Characteristics                | Main Water-Heating Fuel        |                           |                        |                                |                           |                        |                                |                           | RSE Row Factors |  |
|--|--------------------------------|---------------------------|------------------------|--------------------------------|---------------------------|------------------------|--------------------------------|---------------------------|-----------------|--|
|  | Natural Gas                    |                           |                        | Electricity                    |                           |                        | Liquefied Petroleum Gas        |                           |                 |  |
|  | Number of Households (million) | Consumption (million Btu) | Expenditures (dollars) | Number of Households (million) | Consumption (million Btu) | Expenditures (dollars) | Number of Households (million) | Consumption (million Btu) |                 |  |
| RSE Column Factors:                      | 1.041                          | 0.405                     | 0.482                  | 1.348                          | 0.514                     | 0.543                  | 3.972                          | 1.793                     | 1.838           |  |
| <b>Year of Construction</b>              |                                |                           |                        |                                |                           |                        |                                |                           |                 |  |
| 1939 or Before .....                     | 13.2                           | 22.1                      | 126                    | 5.6                            | 9.7                       | 206                    | 0.7                            | 16.5                      | 155             |  |
| 1940 to 1949 .....                       | 4.8                            | 21.9                      | 123                    | 2.5                            | 10.0                      | 202                    | .3                             | 22.0                      | 221             |  |
| 1950 to 1959 .....                       | 7.9                            | 23.3                      | 125                    | 3.6                            | 9.8                       | 199                    | .3                             | 19.3                      | 186             |  |
| 1960 to 1969 .....                       | 10.1                           | 21.9                      | 122                    | 4.6                            | 9.7                       | 195                    | .4                             | 14.5                      | 127             |  |
| 1970 to 1974 .....                       | 5.3                            | 22.6                      | 118                    | 3.6                            | 10.3                      | 208                    | .3                             | 18.3                      | 171             |  |
| 1975 to 1979 .....                       | 4.2                            | 20.7                      | 104                    | 5.3                            | 10.0                      | 201                    | .5                             | 23.1                      | 178             |  |
| 1980 to 1984 .....                       | 2.6                            | 21.6                      | 115                    | 4.1                            | 9.6                       | 195                    | .4                             | 17.1                      | 133             |  |
| 1985 or After .....                      | 1.1                            | 26.1                      | 138                    | 2.6                            | 9.4                       | 201                    | Q                              | Q                         | 12.73           |  |
| <b>1987 Family Income</b>                |                                |                           |                        |                                |                           |                        |                                |                           |                 |  |
| Less than \$5,000 .....                  | 3.3                            | 20.1                      | 109                    | 2.1                            | 8.3                       | 178                    | .4                             | 13.7                      | 140             |  |
| \$5,000 to \$9,999 .....                 | 6.2                            | 20.0                      | 108                    | 3.9                            | 9.4                       | 191                    | .5                             | 17.0                      | 145             |  |
| \$10,000 to \$14,999 .....               | 6.6                            | 20.9                      | 114                    | 4.8                            | 9.1                       | 190                    | .5                             | 19.6                      | 158             |  |
| \$15,000 to \$19,999 .....               | 4.7                            | 21.0                      | 114                    | 3.5                            | 9.0                       | 186                    | .3                             | 20.2                      | 169             |  |
| \$20,000 to \$24,999 .....               | 4.5                            | 20.7                      | 108                    | 3.4                            | 10.5                      | 209                    | .3                             | 17.9                      | 151             |  |
| \$25,000 to \$34,999 .....               | 8.6                            | 21.8                      | 121                    | 6.0                            | 9.6                       | 197                    | .5                             | 19.3                      | 186             |  |
| \$35,000 to \$49,999 .....               | 7.3                            | 24.7                      | 135                    | 4.7                            | 11.0                      | 222                    | .3                             | 21.0                      | 179             |  |
| \$50,000 or More .....                   | 8.1                            | 25.6                      | 144                    | 3.6                            | 11.0                      | 227                    | .2                             | 21.9                      | 205             |  |
| <b>Below 100 Percent of Poverty Line</b> |                                |                           |                        |                                |                           |                        |                                |                           |                 |  |
| Below 100 Percent of Poverty Line .....  | 6.3                            | 24.0                      | 132                    | 4.0                            | 10.1                      | 212                    | .8                             | 18.6                      | 156             |  |
| <b>Below 125 Percent of Poverty Line</b> |                                |                           |                        |                                |                           |                        |                                |                           |                 |  |
| Below 125 Percent of Poverty Line .....  | 9.8                            | 22.8                      | 125                    | 6.3                            | 10.0                      | 209                    | 1.1                            | 19.0                      | 166             |  |
| <b>Race of Householder</b>               |                                |                           |                        |                                |                           |                        |                                |                           |                 |  |
| White .....                              | 40.2                           | 21.6                      | 116                    | 28.7                           | 9.7                       | 197                    | 2.6                            | 18.0                      | 158             |  |
| Black .....                              | 7.1                            | 26.1                      | 154                    | 2.7                            | 11.2                      | 239                    | .3                             | 17.7                      | 184             |  |
| Other .....                              | 1.9                            | 22.1                      | 119                    | .6                             | 9.0                       | 204                    | Q                              | 28.6                      | 217             |  |
| <b>Householder of Hispanic Descent</b>   |                                |                           |                        |                                |                           |                        |                                |                           |                 |  |
| Yes .....                                | 3.2                            | 22.7                      | 125                    | 1.2                            | 10.5                      | 250                    | Q                              | Q                         | Q               |  |
| No .....                                 | 46.1                           | 22.2                      | 121                    | 30.8                           | 9.8                       | 199                    | 2.9                            | 18.2                      | 162             |  |
| <b>Age of Householder</b>                |                                |                           |                        |                                |                           |                        |                                |                           |                 |  |
| Under 25 Years .....                     | 3.6                            | 20.3                      | 109                    | 2.6                            | 9.2                       | 192                    | Q                              | Q                         | Q               |  |
| 25 to 34 Years .....                     | 12.1                           | 23.1                      | 125                    | 7.5                            | 10.3                      | 213                    | .6                             | 20.3                      | 170             |  |
| 35 to 44 Years .....                     | 9.6                            | 25.6                      | 136                    | 6.4                            | 10.9                      | 224                    | .6                             | 22.0                      | 179             |  |
| 45 to 59 Years .....                     | 10.2                           | 24.0                      | 133                    | 6.8                            | 10.2                      | 208                    | .7                             | 16.7                      | 152             |  |
| 60 Years and Over .....                  | 13.8                           | 18.4                      | 103                    | 8.6                            | 8.4                       | 171                    | 1.0                            | 16.5                      | 161             |  |
| <b>Household Size</b>                    |                                |                           |                        |                                |                           |                        |                                |                           |                 |  |
| 1 Person .....                           | 12.3                           | 14.1                      | 75                     | 6.9                            | 6.1                       | 125                    | .5                             | 13.5                      | 130             |  |
| 2 Persons .....                          | 15.8                           | 19.8                      | 108                    | 11.9                           | 8.8                       | 182                    | 1.1                            | 15.9                      | 150             |  |
| 3 Persons .....                          | 8.3                            | 24.9                      | 137                    | 5.7                            | 11.5                      | 232                    | .4                             | 16.4                      | 140             |  |
| 4 Persons .....                          | 7.5                            | 29.6                      | 162                    | 4.7                            | 12.6                      | 261                    | .6                             | 25.0                      | 203             |  |
| 5 Persons .....                          | 3.6                            | 32.2                      | 180                    | 1.9                            | 14.3                      | 292                    | .2                             | 23.7                      | 196             |  |
| 6 or More Persons .....                  | 1.8                            | 37.0                      | 209                    | 1.0                            | 16.0                      | 334                    | .2                             | 26.1                      | 225             |  |

NA Data not available.

Q Data withheld either because the RSE was greater than 50 percent or fewer than 10 households were sampled.

Notes: • End-use values are statistical estimates based on the 1987 RECS. • See Appendix B for methodology of end-use estimates. • Electricity Consumption is based on site electricity. No adjustment is made for primary fuels consumed to produce electricity. • To obtain a Relative Standard Error (RSE) percentage for any table cell, multiply the cell's corresponding column and row factors. • Because of rounding, data may not sum to totals. • See "Glossary" for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use Division, Forms EIA-457 A, B, C, D, E, F of the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).

**Table 32. Air-Conditioning Electricity Consumption and Expenditures per Household, Summer 1987**

| Household Characteristics                              | Number of Households that use Electric Air Conditioning Equipment (million) | Air Conditioning          |                        | Air-Conditioning Intensity        |                       |   |                       | RSE Row Factors |  |
|--|---|---------------------------|------------------------|-----------------------------------|-----------------------|---|-----------------------|-----------------|--|
|  |   | Consumption (million Btu) | Expenditures (dollars) | Consumption (Btu/cdd*square foot) |                       | Expenditures (cents/cdd*1000 square feet) |                       |                 |  |
|  |   |                           |                        | Central Air Conditioners          | Room Air Conditioners | Central Air Conditioners                  | Room Air Conditioners |                 |  |
| RSE Column Factors:                                    | 1.102   | 0.912                     | 0.920                  | 0.967                             | 1.072                 | 0.923                                     | 1.132                 |                 |  |
| <b>Total U.S. Households</b>                           | 57.1  | 7.6                       | 170                    | 3.1                               | 3.1                   | 6.7                                       | 7.5                   | 2.25            |  |
| <b>Census Region and Division</b>                      |   |                           |                        |                                   |                       |   |                       |                 |  |
| Northeast  | 10.3  | 3.8                       | 110                    | 3.0                               | 3.1                   | 8.4                                       | 9.5                   | 4.89            |  |
| New England  | 1.8   | 2.7                       | 69                     | 3.7                               | 3.8                   | 9.3                                       | 10.2                  | 10.17           |  |
| Middle Atlantic  | 8.5   | 4.0                       | 119                    | 3.0                               | 2.9                   | 8.3                                       | 9.4                   | 5.41            |  |
| Midwest  | 15.0  | 5.7                       | 137                    | 3.1                               | 3.1                   | 7.5                                       | 7.7                   | 3.95            |  |
| East North Central                                     | 9.9   | 5.0                       | 126                    | 3.1                               | 3.3                   | 7.7                                       | 8.4                   | 5.28            |  |
| West North Central                                     | 5.1   | 7.2                       | 159                    | 3.3                               | 2.8                   | 7.2                                       | 6.4                   | 5.70            |  |
| South  | 25.3  | 10.9                      | 226                    | 3.4                               | 3.3                   | 6.9                                       | 6.9                   | 3.12            |  |
| South Atlantic   | 12.3  | 9.9                       | 217                    | 3.1                               | 2.9                   | 6.8                                       | 6.4                   | 5.08            |  |
| East South Central                                     | 5.1   | 10.3                      | 180                    | 3.8                               | 3.5                   | 6.6                                       | 6.3                   | 5.03            |  |
| West South Central                                     | 7.8   | 12.7                      | 268                    | 3.6                               | 3.7                   | 7.4                                       | 8.2                   | 6.03            |  |
| West   | 6.5   | 5.3                       | 125                    | 2.4                               | 2.7                   | 5.7                                       | 5.8                   | 7.13            |  |
| Mountain   | 1.5   | 7.4                       | 176                    | 2.1                               | 1.8                   | 4.9                                       | 4.5                   | 11.95           |  |
| Pacific  | 4.9   | 4.7                       | 109                    | 2.7                               | 3.0                   | 6.5                                       | 6.4                   | 8.38            |  |
| <b>Metropolitan Status</b>                             |   |                           |                        |                                   |                       |   |                       |                 |  |
| Metropolitan   | 45.5  | 7.7                       | 176                    | 3.0                               | 3.1                   | 6.7                                       | 7.7                   | 2.50            |  |
| Central City   | 17.8  | 7.2                       | 162                    | 3.3                               | 3.1                   | 7.0                                       | 7.9                   | 4.18            |  |
| Outside Central City                                   | 27.7  | 8.0                       | 184                    | 2.9                               | 3.1                   | 6.5                                       | 7.5                   | 3.17            |  |
| Nonmetropolitan  | 11.6  | 7.3                       | 149                    | 3.4                               | 3.4                   | 6.9                                       | 7.1                   | 4.74            |  |
| <b>Climate Zone</b>                                    |   |                           |                        |                                   |                       |   |                       |                 |  |
| Under 2,000 CDD and--                                  |   |                           |                        |                                   |                       |   |                       |                 |  |
| Over 7,000 HDD   | 3.3   | 3.7                       | 77                     | 3.0                               | 3.5                   | 6.2                                       | 7.2                   | 8.25            |  |
| 5,500 to 7,000 HDD                                     | 14.8  | 4.5                       | 115                    | 3.1                               | 3.1                   | 7.9                                       | 8.1                   | 3.95            |  |
| 4,000 to 5,499 HDD                                     | 14.8  | 6.7                       | 152                    | 3.4                               | 3.1                   | 7.2                                       | 8.1                   | 4.41            |  |
| Under 4,000 HDD  | 10.6  | 7.2                       | 153                    | 3.3                               | 3.6                   | 6.9                                       | 7.9                   | 5.29            |  |
| 2,000 CDD or More and --                               |   |                           |                        |                                   |                       |   |                       |                 |  |
| Under 4,000 HDD  | 13.5  | 13.3                      | 287                    | 3.3                               | 2.9                   | 7.0                                       | 6.5                   | 4.79            |  |
| <b>Housing Structure by Status of Unit</b>             |   |                           |                        |                                   |                       |   |                       |                 |  |
| Single-Family Detached                                 | 35.1  | 9.0                       | 199                    | 2.8                               | 2.9                   | 6.2                                       | 6.6                   | 2.77            |  |
| Owned  | 31.6  | 9.2                       | 203                    | 2.8                               | 2.8                   | 6.2                                       | 6.4                   | 2.84            |  |
| Rented   | 3.5   | 7.4                       | 164                    | 3.2                               | 3.6                   | 6.8                                       | 8.1                   | 8.77            |  |
| Single-Family Attached                                 | 3.8   | 6.4                       | 154                    | 2.8                               | 2.8                   | 6.3                                       | 8.2                   | 9.52            |  |
| Owned  | 2.7   | 5.6                       | 141                    | 2.3                               | 2.8                   | 5.5                                       | 8.5                   | 9.53            |  |
| Rented   | 1.1   | 8.3                       | 185                    | 4.1                               | 2.9                   | 8.9                                       | 7.7                   | 20.53           |  |
| Building of 2 to 4 Units                               | 4.8   | 5.1                       | 128                    | 4.5                               | 2.9                   | 9.4                                       | 8.5                   | 9.64            |  |
| Owned  | 1.2   | 4.3                       | 127                    | 3.0                               | 2.0                   | 7.5                                       | 6.6                   | 20.95           |  |
| Rented   | 3.6   | 5.3                       | 122                    | 5.1                               | 3.6                   | 10.1                                      | 10.2                  | 10.67           |  |
| Building of 5 or More Units                            | 10.3  | 5.0                       | 115                    | 4.5                               | 3.8                   | 9.8                                       | 10.0                  | 7.27            |  |
| Owned  | .8  | 4.8                       | 130                    | 3.1                               | 3.5                   | 7.5                                       | 12.0                  | 21.72           |  |
| Rented   | 9.4   | 5.0                       | 114                    | 4.8                               | 3.9                   | 10.4                                      | 10.0                  | 7.21            |  |
| Mobile Home  | 3.1   | 5.6                       | 121                    | 5.2                               | 5.3                   | 11.3                                      | 11.1                  | 8.89            |  |
| Owned  | 2.7   | 5.7                       | 122                    | 5.5                               | 5.2                   | 12.0                                      | 11.0                  | 10.16           |  |
| Rented   | .5  | 5.2                       | 112                    | Q                                 | 5.5                   | Q   | 12.0                  | 12.84           |  |
| <b>Measured Heated Area of Residence (square feet)</b> |   |                           |                        |                                   |                       |   |                       |                 |  |
| Fewer than 600   | 3.6   | 4.5                       | 106                    | 5.8                               | 4.7                   | 12.5                                      | 11.7                  | 10.71           |  |
| 600 to 999   | 14.8  | 5.4                       | 122                    | 4.8                               | 4.1                   | 10.3                                      | 9.8                   | 4.80            |  |
| 1,000 to 1,599   | 16.2  | 7.9                       | 174                    | 3.5                               | 3.3                   | 7.5                                       | 7.5                   | 3.38            |  |
| 1,600 to 1,999   | 7.7   | 8.7                       | 195                    | 3.2                               | 2.7                   | 7.0                                       | 6.7                   | 4.92            |  |
| 2,000 to 2,399   | 5.9   | 8.6                       | 196                    | 2.8                               | 2.7                   | 6.2                                       | 6.9                   | 6.40            |  |
| 2,400 to 2,999   | 4.9   | 9.2                       | 207                    | 2.8                               | 2.6                   | 6.3                                       | 6.6                   | 6.21            |  |
| 3,000 or More  | 3.9   | 11.6                      | 264                    | 2.6                               | 2.0                   | 5.8                                       | 5.1                   | 6.88            |  |

See footnotes at end of table.

## END-USE /AIR CONDITIONING

**Table 32. Air-Conditioning Electricity Consumption and Expenditures per Household, Summer 1987 (Continued)**

| Household Characteristics                      | Air Conditioning  |                                    | Air-Conditioning Intensity                |                       |                          |                       |                 |       |
|--|---|------------------------------------|---|-----------------------|--------------------------|-----------------------|-----------------|-------|
|  | Number of Households that use Electric Air Conditioning (million) | Consumption (Btu/cdd* square foot) | Expenditures (cents/cdd*1000 square feet) |                       |                          |                       | RSE Row Factors |       |
|  |   |                                    | Central Air Conditioners                  | Room Air Conditioners | Central Air Conditioners | Room Air Conditioners |                 |       |
| RSE Column Factors:                            | 1.102   | 0.912                              | 0.920                                     | 0.967                 | 1.072                    | 0.923                 | 1.132           |       |
| <b>Year of Construction</b>                    |   |                                    |   |                       |                          |                       |                 |       |
| 1939 or Before .....                           | 10.0  | 4.9                                | 118                                       | 3.3                   | 2.8                      | 7.6                   | 7.2             | 5.13  |
| 1940 to 1949 .....                             | 4.6   | 6.8                                | 148                                       | 3.6                   | 3.1                      | 7.5                   | 7.2             | 7.10  |
| 1950 to 1959 .....                             | 8.1   | 7.6                                | 175                                       | 3.3                   | 3.0                      | 7.4                   | 7.2             | 5.65  |
| 1960 to 1969 .....                             | 1.3   | 8.4                                | 185                                       | 3.0                   | 3.5                      | 6.4                   | 8.4             | 5.50  |
| 1970 to 1974 .....                             | 6.9   | 7.6                                | 168                                       | 3.4                   | 3.7                      | 7.4                   | 8.5             | 7.31  |
| 1975 to 1979 .....                             | 7.8   | 9.9                                | 218                                       | 3.0                   | 3.8                      | 6.6                   | 8.3             | 6.74  |
| 1980 to 1984 .....                             | 5.5   | 8.1                                | 175                                       | 2.9                   | 3.0                      | 6.3                   | 6.6             | 7.45  |
| 1985 or After .....                            | 3.0   | 7.9                                | 177                                       | 2.5                   | 2.6                      | 5.5                   | 5.3             | 13.96 |
| <b>1987 Family Income</b>                      |   |                                    |   |                       |                          |                       |                 |       |
| Less than \$5,000 .....                        | 2.9   | 5.3                                | 117                                       | 4.1                   | 3.3                      | 8.9                   | 7.5             | 8.27  |
| \$5,000 to \$9,999 .....                       | 5.8   | 5.5                                | 120                                       | 3.3                   | 3.1                      | 7.0                   | 7.0             | 6.94  |
| \$10,000 to \$14,999 .....                     | 7.1   | 5.9                                | 130                                       | 3.3                   | 3.4                      | 7.1                   | 7.9             | 5.42  |
| \$15,000 to \$19,999 .....                     | 5.5   | 5.9                                | 131                                       | 2.9                   | 3.2                      | 6.3                   | 7.3             | 5.7   |
| \$20,000 to \$24,999 .....                     | 5.5   | 7.4                                | 165                                       | 3.4                   | 3.4                      | 7.3                   | 8.0             | 6.30  |
| \$25,000 to \$34,999 .....                     | 10.9  | 8.1                                | 178                                       | 3.2                   | 3.3                      | 6.9                   | 8.0             | 4.88  |
| \$35,000 to \$49,999 .....                     | 9.6   | 8.8                                | 197                                       | 3.1                   | 3.0                      | 6.7                   | 7.3             | 5.14  |
| \$50,000 or More .....                         | 9.7   | 10.0                               | 234                                       | 2.8                   | 3.0                      | 6.5                   | 8.3             | 4.88  |
| <b>Below 100 Percent of Poverty Line</b> ..... | 5.3   | 6.0                                | 131                                       | 3.8                   | 3.6                      | 8.3                   | 8.1             | 6.03  |
| <b>Below 125 Percent of Poverty Line</b> ..... | 8.8   | 5.9                                | 130                                       | 3.8                   | 3.4                      | 8.1                   | 7.7             | 5.26  |
| <b>Race of Householder</b>                     |   |                                    |   |                       |                          |                       |                 |       |
| White .....                                    | 49.5  | 7.6                                | 170                                       | 3.0                   | 3.0                      | 6.6                   | 7.3             | 2.31  |
| Black .....                                    | 6.2   | 8.5                                | 184                                       | 3.8                   | 3.6                      | 8.0                   | 8.4             | 6.86  |
| Other .....                                    | 1.3   | 5.0                                | 118                                       | 2.6                   | 4.7                      | 5.7                   | 12.2            | 14.47 |
| <b>Householder of Hispanic Descent</b>         |   |                                    |   |                       |                          |                       |                 |       |
| Yes .....                                      | 2.8   | 8.0                                | 197                                       | 3.5                   | 3.7                      | 8.4                   | 9.4             | 10.15 |
| No .....                                       | 54.3  | 7.6                                | 169                                       | 3.0                   | 3.1                      | 6.6                   | 7.5             | 2.32  |
| <b>Age of Householder</b>                      |   |                                    |   |                       |                          |                       |                 |       |
| Under 25 Years .....                           | 4.0   | 6.0                                | 130                                       | 3.7                   | 3.5                      | 7.8                   | 8.0             | 8.30  |
| 25 to 34 Years .....                           | 3.6   | 7.2                                | 162                                       | 3.3                   | 3.5                      | 7.3                   | 8.3             | 4.44  |
| 35 to 44 Years .....                           | 11.7  | 8.3                                | 186                                       | 3.0                   | 3.4                      | 6.6                   | 8.0             | 4.06  |
| 45 to 59 Years .....                           | 12.1  | 9.2                                | 203                                       | 3.2                   | 3.1                      | 6.8                   | 7.6             | 4.35  |
| 60 Years and Over .....                        | 15.7  | 6.5                                | 150                                       | 2.7                   | 2.7                      | 6.2                   | 6.6             | 4.31  |
| <b>Household Size</b>                          |   |                                    |   |                       |                          |                       |                 |       |
| 1 Person .....                                 | 12.9  | 4.7                                | 106                                       | 2.8                   | 2.7                      | 6.1                   | 6.8             | 4.59  |
| 2 Persons .....                                | 20.3  | 7.5                                | 168                                       | 2.8                   | 2.8                      | 6.2                   | 6.7             | 3.53  |
| 3 Persons .....                                | 9.9   | 8.7                                | 195                                       | 3.1                   | 4.0                      | 6.9                   | 9.4             | 4.89  |
| 4 Persons .....                                | 8.9   | 9.7                                | 215                                       | 3.3                   | 3.1                      | 7.3                   | 7.4             | 4.59  |
| 5 Persons .....                                | 3.6   | 10.1                               | 226                                       | 3.6                   | 4.0                      | 9.5                   | 6.09            | 11.14 |
| 6 or More Persons .....                        | 1.5   | 8.1                                | 194                                       | 3.4                   | 3.0                      | 7.9                   | 7.7             | 9.82  |
| <b>All Electricity Paid by Household</b>       |   |                                    |   |                       |                          |                       |                 |       |
| Yes .....                                      | 53.7  | 7.7                                | 174                                       | 3.0                   | 3.1                      | 6.6                   | 7.4             | 2.33  |
| Budget Plan .....                              | 1.0   | 9.6                                | 193                                       | 3.0                   | 2.2                      | 6.0                   | 4.7             | 14.58 |
| No Budget Plan .....                           | 52.7  | 7.7                                | 173                                       | 3.0                   | 3.1                      | 6.6                   | 7.5             | 2.34  |
| No .....                                       | 3.4   | 5.5                                | 114                                       | 5.5                   | 3.9                      | 10.8                  | 8.7             | 9.82  |
| <b>All-Electric Home</b>                       |   |                                    |   |                       |                          |                       |                 |       |
| Yes .....                                      | 12.1  | 9.7                                | 203                                       | 3.1                   | 3.0                      | 6.4                   | 6.0             | 5.64  |
| No .....                                       | 44.9  | 7.0                                | 161                                       | 3.1                   | 3.2                      | 7.0                   | 7.7             | 2.79  |

See footnotes at end of table.

**Table 32. Air-Conditioning Electricity Consumption and Expenditures per Household, Summer 1987 (Continued)**

| Household Characteristics                 | Number of Households that use Electric Air Conditioning Equipment (million) | Air Conditioning          |                        | Air-Conditioning Intensity        |                       |   |                       | RSE Row Factors |  |
|---|---|---------------------------|------------------------|-----------------------------------|-----------------------|---|-----------------------|-----------------|--|
|   |   | Consumption (million Btu) | Expenditures (dollars) | Consumption (Btu/cdd*square foot) |                       | Expenditures (cents/cdd*1000 square feet) |                       |                 |  |
|   |   |                           |                        | Central Air Conditioners          | Room Air Conditioners | Central Air Conditioners                  | Room Air Conditioners |                 |  |
| RSE Column Factors:                       | 1.102   | 0.912                     | 0.920                  | 0.967                             | 1.072                 | 0.923                                     | 1.132                 |                 |  |
| <b>Number of Rooms Air Conditioned</b>    |   |                           |                        |                                   |                       |   |                       |                 |  |
| One .....                                 | 6.4   | 1.7                       | 45                     | Q                                 | 4.7                   | Q   | 12.3                  | 5.76            |  |
| Two to Four .....                         | 9.0   | 3.7                       | 89                     | 3.8                               | 3.5                   | 8.7                                       | 8.4                   | 6.32            |  |
| Five or More .....                        | 1.4   | 7.3                       | 179                    | 3.0                               | 2.5                   | 7.2                                       | 6.3                   | 11.34           |  |
| Entire House .....                        | 40.3  | 9.4                       | 207                    | 3.0                               | 2.7                   | 6.7                                       | 6.3                   | 2.66            |  |
| <b>Type of Air Conditioning Equipment</b> |   |                           |                        |                                   |                       |   |                       |                 |  |
| Central Air .....                         | 30.1  | 10.8                      | 237                    | 3.1                               | NA                    | 6.7                                       | NA                    | 2.52            |  |
| Window Unit .....                         | 26.9  | 4.0                       | 95                     | NA                                | 3.1                   | NA  | 7.5                   | 2.87            |  |
| One .....                                 | 18.4  | 3.2                       | 75                     | NA                                | 3.5                   | NA  | 8.2                   | 3.66            |  |
| Two or more .....                         | 8.6   | 5.6                       | 138                    | NA                                | 2.7                   | NA  | 6.6                   | 3.91            |  |
| <b>Frequency of Air Conditioning Use</b>  |   |                           |                        |                                   |                       |   |                       |                 |  |
| Frequently Used .....                     | 31.9  | 10.7                      | 236                    | 3.4                               | 3.9                   | 7.4                                       | 9.0                   | 2.68            |  |
| Seldom Used .....                         | 20.1  | 3.5                       | 86                     | 1.9                               | 2.3                   | 4.5                                       | 5.9                   | 3.24            |  |
| Other/or Did Not Use .....                | 5.0   | 3.9                       | 87                     | 2.2                               | 1.7                   | 4.9                                       | 4.0                   | 13.95           |  |
| <b>Has Evaporative Cooler</b>             |   |                           |                        |                                   |                       |   |                       |                 |  |
| Yes .....                                 | .6  | 3.0                       | 67                     | .9                                | 1.5                   | 1.9                                       | 3.5                   | 23.42           |  |
| No .....                                  | 56.5  | 7.6                       | 171                    | 3.1                               | 3.2                   | 6.8                                       | 7.5                   | 2.26            |  |

NA Data not available.

Q Data withheld either because the RSE was greater than 50 percent or fewer than 10 households were sampled.

Notes: • End-use values are statistical estimates based on the 1987 RECS. • See Appendix B for methodology of end-use estimates.

• Btu/cdd\*square foot and cents/cdd\*1000 square feet are the Btu or cents per cooling degree-day and square foot of the housing unit. They are values that have been adjusted for the effects of the weather and size of the residence. See Appendix C for a description of the method used to calculate the values. • Electricity Consumption is based on site electricity. No adjustment is made for primary fuels consumed to produce electricity. • To obtain a Relative Standard Error (RSE) Percentage for any table cell, multiply the cell's corresponding column and row factors. • Because the small amount of natural gas that is used for air conditioning is omitted and because of rounding, data may not sum to totals. • See "Glossary" for definition of terms used in this report.

Source: Energy Information Administration, Office of Energy Markets and End Use Division, Forms EIA-457 A, B, C, E of the 1987 Residential Energy Consumption Survey (for specific titles of forms, see Appendix D).







## **Appendix A**

### **How the Survey Was Conducted**





# How the Survey Was Conducted

### Introduction

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

This report provides national data based on the results from the Fuel Supplier Survey. A later report *Household Energy Consumption and Expenditures 1987, Part 2: Regional Data* will present the results of the Fuel Supplier Survey by Census regions and divisions. A previous report, *Housing Characteristics 1987*, presented data based on results from the Household Survey.

This appendix contains sections providing detailed information for the Sample Design, Household Survey and its adjunct Rental Agent Survey, Supplemental Data Collection for the Family Support Administration, Fuel Supplier Survey, Confidentiality of the Data, Data Preparation for the Report and Public Use Tape Preparation.

### Sample Design

The universe for the RECS includes all housing units occupied as the primary residence in the 50 States and the District of Columbia. The sample of households used as the basis for the 1987 estimates was selected by using a probability sampling design developed especially for the RECS. The current sample design was used for the first time for the 1980 RECS and was revised prior to the 1984 survey.

### Multistage Area Probability Sample

In both the original and revised sample designs, the total land area of the 50 States and District of Columbia was divided into approximately 1,800 Primary Sampling Units (PSU's) on the basis of Metropolitan Statistical Areas (MSA's), county and independent city boundary lines, and population characteristics.<sup>6</sup>

Specific objectives of the 1984 sample revisions were to update the information for U.S. counties used in sample selection, to maximize the overlap of specific PSU's selected in 1980 and 1984, and to minimize the restructuring of the sample within PSU's that continued in the revised design. The 1980 design included a requirement for a minimum level of precision of estimates for the 9 geographically defined Census divisions and the 10 Federal regions. The requirement for Census divisions was retained for the 1984 design, but the requirement for Federal regions was dropped. In all other respects, the design of sample revisions was based

<sup>6</sup>Boundary definitions for counties, independent cities, and equivalent units were generally those used by the Census of Population and Housing, 1970 and 1980, for the original and revised designs, respectively. There were 3,141 such units in the 1970 Census and 3,135 in the 1980 Census. Prior to 1983, MSA's were referred to as Standard Metropolitan Statistical Areas. The number of PSU's created for the 1980 and 1984 RECS sample designs were, respectively, 1,782 and 1,799. Additional detail on RECS sample design can be found in "The 1987 RECS Sample Design Procedures Manual," prepared by the Response Analysis Corporation.

**Table A1. Sources of Data for 1987 RECS Sample Design**

| Data Components  | Source of Data Used in 1980 Design   | Source of New Data Used in 1984 Revisions |
|--|--|---|
| Population estimates for counties and equivalent units | July 1978 estimates of the Bureau of the Census  | 1980 Census of Population                 |
| Metropolitan statistical area (MSA) definitions        | Lists published by Office of Management and Budget (OMB). Current as of early 1980, with some modifications based on estimates of population changes | OMB definitions published June 27, 1983   |
| Principal home heating fuel                            | 1970 Census of Housing   | 1980 Census of Housing                    |

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, 1987 Residential Energy Consumption Survey.

on a continuation of the general plan used for the 1980, 1981, and 1982 RECS. Three principal sources of information were used to update the data base used for sample revisions: population estimates, MSA definitions, and principal heating fuel (Table A1).

Stratification of PSU's in both the original and revised designs was based on the nine geographically defined Census divisions, metropolitan or nonmetropolitan definitions of PSU's, and to the extent feasible, on dominant space-heating fuel and weather conditions. PSU's in the original design were grouped into 131 strata and in the revised design into 129 strata (Figure A1).

Some PSU's comprising all or part of large metropolitan areas were large enough in population to be a stratum by themselves; PSU's of this type are called Self-

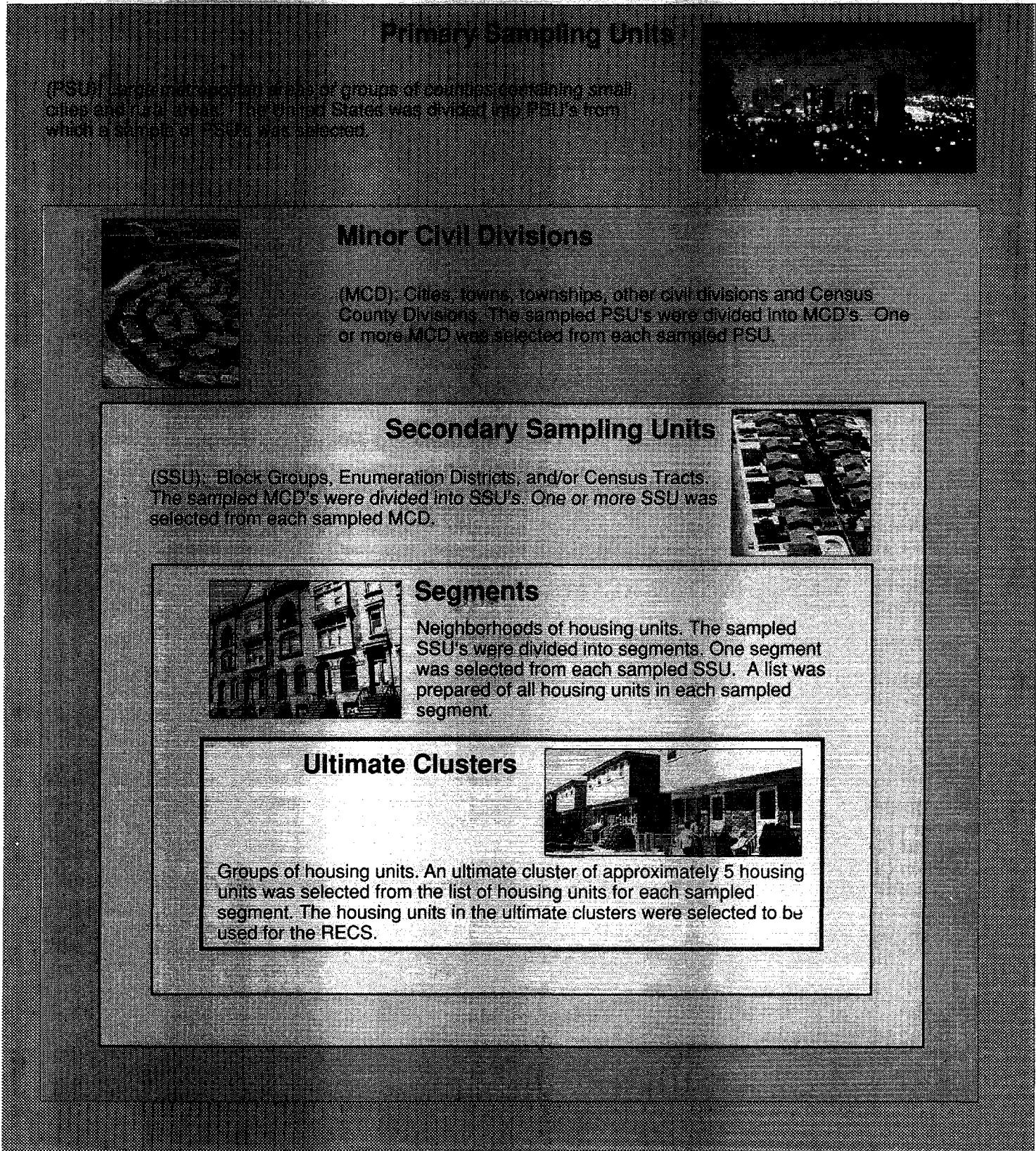
Representing (SR) because the sample from each PSU represents only that PSU. In other strata, one PSU was selected from among two or more PSU's in the stratum. Each of the PSU's selected from these strata is called Non-Self-Representing (NSR) because each PSU also represents the nonselected PSU's in its stratum. The revised design included 129 strata, of which 32 were SR PSU's and 97 were NSR.

Although both PSU's and strata were often defined somewhat differently in the two designs, the specific procedures used to make probability selections of PSU's for the revised design produced a high degree of overlap in the actual PSU's selected. Of the 129 PSU's in the revised design, 111 continued in the sample from the original design and 18 were newly selected.



*These single-family attached housing units are examples of housing structures sampled in the RECS.*

**Figure A1. Multistage Area Probability Sample Activities**



Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, the 1987 Residential Energy Consumption Survey.

A number of intermediate probability sampling stages producing successively finer geographic detail, preceded the final selection of RECS households in the 1987 sample.

- *Minor Civil Divisions (MCD)* such as cities, towns, and other Census units were selected within each PSU. Within the MCD's, Secondary Sampling Units consisting of census tracts, block groups, or enumeration districts (ED's) were selected. In the RECS design, 1,516 units are selected at this secondary level (tracts or ED's). These tracts and ED's continue in the RECS sample for a number of surveys. Rough field counts in tracts and ED's form the basis for selection of listing segments of 25 or more housing units, with well-defined geographic boundaries.
- A *listing segment* is selected from each tract or ED. Detailed field listings are created for selected segments by field workers who visit the area and identify each housing unit by street address, apartment number, or other obvious features.
- A *penultimate cluster* of 25 or fewer housing units is selected from each *listing segment*. The *ultimate cluster* to be contacted for interviews (averaging about 5 housing units for the 1987 RECS) is systematically selected from the penultimate cluster, and these housing units constitute the assignments given to interviewers.

## Longitudinal Sample Design

A plan for rotation of sample units from an earlier RECS, first used in the 1982 RECS, was continued in 1987. The primary objective of this rotation plan was to observe changes in a sample of the same housing units over the period between two RECS data-collection cycles. To accomplish this objective in an efficient way and to set the stage for continuity in the RECS series, systematic random procedures were used to divide the total set of 1,516 tracts and ED's into four subsamples, designated in Table A2 as C, D, E, and F.

In the 1987 RECS, Groups C and D were the returning rotation groups in which procedures were designed to interview a sample of the same housing units that had been in the sample in the preceding 1984 RECS. This half of the sample had used the revised design for the 1984 RECS.

Groups E and F constitute the new rotation groups in which housing units were included in the RECS sample for the first time in 1987. Selection of housing units in the new rotation groups was based on the revised sample design used for the first time for this half of the 1987 RECS.

Procedures for updating the sample for new construction and for other changes in the housing unit stock were incorporated in sampling operations so that each rotation group, as well as the total RECS sample, is a probability sample of the population covered by the survey.

### **Returning Rotation Groups C and D**

The general plan for these sample units (758 of the total of 1,516) was to conduct interviews in the same housing units that had been contacted 3 years earlier--including housing units that had been vacant, as well as noninterviews (refusals, not-at-homes, etc.), and completed units--plus a supplemental sample of housing units in sample clusters believed to include large proportions of low-income households.

Before contacting households for the 1987 RECS, interviewers made visits to sample segments to check 1984 housing unit listings for missed units and to update listings for new construction, demolition, and conversion of structures from one use to another. Newly constructed or converted units, and those missed in the 1984 listings, were sampled at the 1987 RECS sampling rate.

### **Rotation Groups E and F**

The 758 sample units (at the census tract or ED level) in these rotation groups included 615 that continued in the sample from the original design and 143 newly

**Table A2. Overview of RECS Sample Operations**

| Rotation Group | 1982 | 1984 | 1987 | 1990 |
|----------------|------|------|------|------|
| C              | R    | S*   | R    | N    |
| D              | R    | N*   | R    | S    |
| E              | S    | R    | N*   | R    |
| F              | N    | R    | S*   | R    |

\* Revised sample used for the first time for these rotation groups; new tracts/ED's were selected in sample units that did not continue from the original sample.

R = Housing units return from preceding survey.

S = Selected housing units from the same penultimate clusters as had been used in the preceding survey.

N = Selected new listing segments.

selected units. In the 143 newly selected units, up-to-date field counts and detailed listings of housing units formed the basis for selection of a listing segment and a cluster of 25 housing units from the listing segment.

In the 615 tracts and ED's that continued in the sample, the first step was to perform a new construction update procedure based on a canvass, primarily by telephone, of local sources of information (such as building-permit-issuing agencies, zoning boards, and tax offices). The objective was to determine whether significant new construction—defined as groups of 25 or more housing units—had occurred within the tracts or ED's since 1982. In the canvass, significant new construction was found in census tracts and ED's in approximately 205 of the 615 units. New field counts were made and new segments were selected based on the new measures of size.

In census tracts and ED's in which significant new construction (clusters of 25 or more new housing units) was not found, procedures diverged in Rotation Groups E and F. In Rotation Group F, 1984 RECS housing unit listings were checked and updated (for such things as missed units, new construction) before the start of field contacts for interviews. This step in Rotation Group F was identical to the listing checks carried out for Rotation Groups C and D. However, housing units for the 1987 RECS sample were selected from among those *not* selected in the earlier RECS. In Rotation Group E, a new listing segment was selected for the 1987 RECS.

## Supplemental Sample

A feature of the 1987 survey (continuing from previous RECS) was a supplemental sample of households designed to be merged with the main RECS sample and meet special analytical needs of the Office of Family Assistance, Family Support Administration (FSA). The supplemental sample comprised some 1,258 (17.5 percent) of the total sample of 7,183 occupied housing

units. See section "Supplemental Data Collection for the Family Support Administration" (FSA) later in this Appendix.

The plan for the supplemental sample included procedures to "oversample" households below poverty level, particularly those using electricity, fuel oil, or kerosene as the main space-heating fuel. The number of households in the population using these fuels (as the main space-heating fuel) is smaller than the number using natural gas. Consequently, the number of sample households (in the main sample) using electricity, fuel oil, or kerosene is smaller than the number using natural gas. The analytical needs of FSA require an increased sample size for households below poverty level, particularly those using electricity, fuel oil, or kerosene as the main space-heating fuel. Thus, procedures were designed to increase the sample size for households of these types to the extent feasible.

As a first step in selection of the supplemental sample, interviewers were instructed to rate the general income level of households in the listing segment based on their observations of housing units in the segment and their general knowledge of the area (after completing their listing of housing units in the segment). Interviewers placed each listing segment into one of four groups: Highest 25 percent (well-off or wealthy), upper middle, lower middle, or lowest 25 percent (poor or near-poor). Whenever possible, listing segments that were rated on income were also rated on main home-heating fuel in the sample segment.

The actual selection of supplemental units was accomplished by increasing sampling rates in listing segments that interviewers judged to include large proportions of poor or near-poor households and, in some cases, lower-middle income segments were included. Relative sampling rates were established for groups of housing units as shown in Table A3.

An additional aspect of the selection of supplemental units was a ceiling on the actual sampling rate that applied to any given sample unit. The ceiling was equal to the highest overall sampling rate used in any Census division in the 1987 RECS sample. Thus, in some cases

**Table A3. Relative Sampling Rates Based on Income Rating and Main Home-Heating Fuels**

| Main Home-Heating Fuel                 | Income Rating           |              |                   |
|--|-------------------------|--------------|-------------------|
|  | Upper-Middle or Highest | Lower-Middle | Poor or Near-Poor |
| Electricity or Fuel Oil/Kerosene ..... | 1.0                     | 1.3          | 2.5               |
| All Other Fuels .....                  | 1.0                     | 1.0          | 2.2               |

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, 1987 Residential Energy Consumption Survey.

the relative sampling rates shown in Table A3 were adjusted downward so that the overall sampling rate for housing units did not exceed the ceiling rate for the 1987 RECS.

A relative sampling rate of 1.0 in Table A3 means that the overall sampling rate applied to households in a sample cluster is the rate established for the main sample. Relative sampling rates higher than 1.0 were used for households in the "oversampled" groups shown in Table A3. (For example, a relative sampling rate of 1.3 means that households in the group were sampled at a rate of 30 percent higher than the rate established for the main sample.) An estimated 1,258 additional households (that is, households selected as a result of the supplemental sampling process) were selected in 510 segments, and 1,108 interviews were completed in these households (including both personal and mailed questionnaires).<sup>7</sup>

The outcome of the oversampling procedure is summarized in Table A4. Some 30.7 percent of completed interviews in the supplemental sample were with households below the poverty level, compared with 13.0 percent of completed interviews in the main sample. The corresponding figures for 125 percent of poverty level were 43.3 percent and 20.4 percent of supplemental sample and main sample interviews, respectively.

## Household Survey

### Data Collection Procedures

The original sample consisted of 8,232 units, of which some 225 either were not used for dwelling purposes or were not habitable. Of the 8,007 habitable housing units, 824 were ineligible for this study due to a current vacancy or seasonal occupancy (the units were not the primary residence for the occupants). Personal interviews were conducted at 5,856 of the 7,183 eligible units, for a response rate of 81.5 percent. Subsequently, mail questionnaires were sent to 1,153 of the 1,327 households that had not participated in personal interviews. Completed questionnaires were returned by 373 of these households, or 32.4 percent of those mailed. Of the total eligible households, responses were received from 86.7 percent (or 6,229 households).

Approximately three-quarters of the personal interviews were completed in September and October 1987; 94 percent were completed by the end of December 1987. Interviewing continued until February 1988 in a few sample locations in which low response rates were

**Table A4. Poverty Status in 1987 and Home-Heating Fuel in 1987 RECS Main and Supplemental Samples<sup>a</sup>**

| Poverty Status and Home Heating Fuel         | Basic Sample Households <sup>a</sup> |         | Supplemental Sample Households <sup>a</sup> |         |
|--|--------------------------------------|---------|---|---------|
|  | Number                               | Percent | Number                                      | Percent |
| All Households .....                         | 5,121                                | 100.0   | 1,108                                       | 100.0   |
| Below Poverty Level .....                    | 665                                  | 13.0    | 340   | 30.7    |
| Electricity .....                            | 108                                  | 2.1     | 59  | 5.3     |
| Fuel Oil/Kerosene .....                      | 75                                   | 1.5     | 46  | 4.2     |
| Other Fuels .....                            | 482                                  | 9.4     | 235   | 21.2    |
| Not Below Poverty Level ...                  | 4,456                                | 87.0    | 768   | 69.3    |
| Below 125 Percent of Poverty Level .....     | 1,043                                | 20.4    | 480   | 43.3    |
| Electricity .....                            | 159                                  | 3.1     | 81  | 7.3     |
| Fuel Oil/Kerosene .....                      | 135                                  | 2.7     | 70  | 6.3     |
| Other Fuels .....                            | 749                                  | 14.6    | 329   | 29.7    |
| Not Below 125 Percent of Poverty Level ..... | 4,078                                | 79.6    | 628   | 56.7    |

<sup>a</sup> Households are classified according to the poverty status of the family or nonfamily householder. The actual reference period for income reported in the 1987 RECS was the 12 months preceding the RECS interview; the interview date for most households was within the final calendar quarter of 1987.

Notes: • Table shows unweighted numbers and percentages of completed units. • See "Glossary" for the definition of poverty.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, 1987 Residential Energy Consumption Survey.

<sup>7</sup>The estimated numbers of basic sample interviews were derived by multiplying the number of household units in each ultimate cluster by the ratio: Sampling rate for basic sample / Sampling rate for total (basic + supplemental) sample. For example, the ratio above for a sample segment rated "lower-middle" for income level and "electricity or fuel oil/kerosene" as main home-heating fuel, in general, was equal to 1/1.3. The number of units in the supplemental sample was then equal to the total number of units in the ultimate cluster minus the estimated number in the basic sample.

experienced. Most of the 373 completed mail questionnaires were received in February and March 1988. In keeping with past practice in the RECS survey, November was regarded as the rough midpoint for data-collection activity. Thus, November 1987 was the date for determining the independent estimates of the size of the universe of households used in the ratio estimation of survey results. Detailed results of the Household Survey were published in *Housing Characteristics 1987*, DOE/EIA-0314(87), published May 1989.

### **The Interview**

The average personal interview lasted 56 minutes, with 85 percent of the interviews lasting between 30 and 75 minutes. The interview with the householder (or spouse) covered structural features of the house related to energy, such as insulation, doors, and windows; the heating and cooling systems, with the fuels used in these systems; use of wood fuel; energy conservation improvements; household appliances; household vehicles; receipt of government assistance for the cost of heating; and demographic data on household members. The questionnaire is reproduced in Appendix D, "Survey Forms."

At the end of the interview, respondents were asked to sign an authorization form allowing the interviewing contractor to obtain records of energy consumption from the housing unit's energy supplier(s). At this time, the interviewer also measured the dimensions of the housing unit. (See "Estimates of Housing Unit Size" at the end of the Household Survey section, for further details on the measurement of housing units.)

### **The Interviewers**

A total of 293 interviewers completed one or more personal interviews for this study. As shown in Table A5, 131 interviewers (45 percent) had completed interviews on a prior RECS. The remainder were conducting their first RECS, but had interviewing expe-

rience either with other survey research organizations, or with the U.S. Bureau of the Census.

Two-day regional training meetings were held in 5 locations around the country in August 1987. These meetings were attended by 248 of the interviewers (85 percent). Each session was led by a group of trainers who had attended a 2-day workshop in Princeton, New Jersey and were monitored by Department of Energy staff. The 2-day training session for interviewers covered general interviewing techniques, background of the Residential Energy Consumption Surveys, a question by question review of the household questionnaire, ways to measure the respondents' homes, the accurate recording of the Vehicle Identification Number (VIN), and administrative requirements. The 45 interviewers who were not able to attend a regional training meeting were trained either on the telephone by one of the trainers or in person by a field supervisor.

All interviewers were required to complete a practice interview and quiz on the questionnaire and sampling procedures. These materials were reviewed by the contractor's central office staff. The basic training document for both the regional meetings and other training was a 132-page manual, *Instructions for Interviewers, 1987 Residential Energy Consumption Survey*.

Interviewers were paid on an hourly basis for their work on RECS, including time for home study, attendance at training sessions, review of completed interviews, actual interviewing time, and travel time to and from training sessions and sample clusters. Interviewers were also reimbursed at standard mileage rates for use of personal vehicles and other travel expenses. Interviewers working in locations believed to present a hazard to their safety were compensated for use of an escort. Each interviewer conducted an average of 20 interviews. Nineteen interviewers each completed fewer than six interviews; the average for this group of 19 interviewers was 3.5 completed interviews. Seven interviewers completed 50 or more interviews; the average for this group of interviewers was 61.1 completed interviews. Twenty percent of the personal interviews were verified by telephone or mail to ensure that interviews were conducted as intended.

**Table A5. Experience and Training of 1987 RECS Interviewers**

| Experience on Prior RECS | Training for This RECS*   | Number of Interviewers |
|--------------------------|---------------------------|------------------------|
| Yes                      | Regional training meeting | 116                    |
| Yes                      | Other training            | 15                     |
| No                       | Regional training meeting | 132                    |
| No                       | Other training            | 30                     |
|                          |                           | 293                    |

\* All interviewers completed a practice interview and quiz.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, 1987 Residential Energy Consumption Survey.

## Rental-Agent Survey

The Rental-Agent Survey is an adjunct to the Household Survey to verify information from household respondents in rental units on fuels and main heating equipment used. Telephone interviews were carried out with rental agents and landlords of RECS households living in multiunit dwellings whose occupants did not directly pay to utility companies or fuel suppliers for one or more household fuels.

The interviews with rental agents or their representatives were conducted in the spring of 1988. Altogether, 303 rental agents were interviewed. These interviews covered 856 households in 401 buildings. The 856 households were 89.1 percent of the total of 961 households living in multiunit buildings who had one or more fuels included in their rent.

Comparisons were made between rental agents' and household respondents' reports on main heating fuel, main heating equipment, supplemental heating fuel, water-heating fuel, and air-conditioning fuel. Each discrepancy was individually examined. Changes were made in the household record whenever it was judged that the rental agent was more knowledgeable than the household respondent on specific fuels and/or equipment.

Editors generally followed the guideline that the rental agent was the more knowledgeable person when the landlord paid for the fuel and the fuel was used as the main home-heating, water-heating, or air-conditioning fuel, or when the rental agent's description of the main heating equipment differed from that of the household respondent. The respondent was generally considered the more knowledgeable person for the definition of supplemental heating fuel, as the supplemental heating fuel was more likely to be under the household's control, even in multiunit dwellings. The changes in the household records that resulted from these inquiries are given in Table A6.

## Minimizing Nonresponse

In an effort to maximize the validity of the survey data, a multiwave, multicontact approach was employed. Before the initial contacts, a letter was sent to each household from the Director of the Office of Energy Markets and End Use, briefly describing the purposes and stressing the importance of the survey. Beginning in September 1987, interviewers made up to seven or more callbacks at different times of the day throughout the week in an effort to minimize the number of uncontacted households. The interviewers also queried neighbors regarding the most opportune times to contact the prospective respondent. By the end of the first wave, 225 addresses were found to be nonresidential and an additional 760 were found to be ineligible (Table A7). Some 5,075 personal interviews were completed, leaving 2,172 nonrespondents in this wave.

A second wave was initiated in an effort to contact households that were not available during the first wave and to attempt to convince selected first-wave refusals to reconsider. A new set of letters preceded the renewed effort and, in most cases, the sampled housing units were assigned to a different interviewer. Again, up to seven or more attempts were made to contact the prospective respondents. At the end of this wave, an additional 60 addresses were found to be ineligible. As a result of the second wave, an additional 717 interviews were completed, leaving 1,395 nonrespondents.

A third wave was initiated in an effort to reach nonrespondents in a number of locations that had low completion rates. Four addresses were found to be ineligible and an additional 64 personal interviews were completed in the third wave.

In a final attempt to reduce nonresponse, an abbreviated version of the questionnaire (adapted for self-administration) was mailed to most of the remaining

**Table A6. Changes Made in Household Records on the Basis of Information from Rental Agents**

| Type of Changes Made in Household Records   | Fuel Paid by Rental Agent | Number with Any Changes Made | Percentage with Changes Made |
|---|---------------------------|------------------------------|------------------------------|
| All Households in Rental-Agent Survey ..... | 856                       | 358                          | 42                           |
| Main Heating Fuel .....                     | 671                       | 62                           | 9                            |
| Main Heating Equipment .....                | (*)                       | 206                          | 31                           |
| Supplementary Heating Fuel .....            | (*)                       | 29                           | 4                            |
| Water-Heating Fuel .....                    | 811                       | 120                          | 15                           |
| Air-Conditioning Fuel .....                 | 154                       | 61                           | 40                           |

\* For the 671 households whose rental agent paid for the main heating fuel, responses of rental agents and household respondents were compared.  
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, 1987 Residential Energy Consumption Survey.

**Table A7. Interviews Completed by Stage**

|                                    | Personal Interviews |                |               | Status<br>After<br>Third<br>Wave | Mail<br>Questionnaire | Final<br>Status |
|------------------------------------|---------------------|----------------|---------------|----------------------------------|-----------------------|-----------------|
|                                    | First<br>Wave       | Second<br>Wave | Third<br>Wave |                                  |                       |                 |
| Total Listed Units .....           | 8,232               | 2,172          | 1,395         | 8,232                            | 1,327                 | 8,232           |
| Nonhousing Units                   |                     |                |               |                                  |                       |                 |
| Business, Other .....              | 58                  | 0              | 0             | 58                               | —                     | 58              |
| Not Habitable .....                | 92                  | 0              | 0             | 92                               | —                     | 92              |
| Nonhousing Unit .....              | 75                  | 0              | 0             | 75                               | —                     | 75              |
| Subtotal .....                     | 225                 |                |               | 225                              |                       | 225             |
| Housing Units .....                | 8,007               | 2,172          | 1,395         | 8,007                            | 1,327                 | 8,007           |
| Ineligible Units                   |                     |                |               |                                  |                       |                 |
| Vacant .....                       | 646                 | 53             | 4             | 703                              | —                     | 703             |
| Seasonal Vacant .....              | 114                 | 7              | 0             | 121                              | —                     | 121             |
| Subtotal .....                     | 760                 | 60             | 4             | 824                              |                       | 824             |
| Eligible Units .....               | 7,247               | 2,112          | 1,391         | 7,183                            | 1,327                 | 7,183           |
| Not Completed—Personal Interview   |                     |                |               |                                  |                       |                 |
| No One Home .....                  | 715                 | 361            | 65            | 220                              | —                     | 220             |
| Eligible Respondent Not Home ..... | 78                  | 25             | 6             | 32                               | —                     | 32              |
| Refused .....                      | 1,231               | 614            | 58            | * 1,004                          | —                     | 1,004           |
| Illness .....                      | 17                  | 5              | 0             | 9                                | —                     | 9               |
| Language Barrier .....             | 28                  | 7              | 0             | 14                               | —                     | 14              |
| Wrong Respondent or Unit .....     | 5                   | 0              | 0             | 3                                | —                     | 3               |
| Not Contacted <sup>a</sup> .....   | 50                  | 377            | 1,198         | 21                               | —                     | 21              |
| Other .....                        | 48                  | 6              | 0             | 24                               | —                     | 24              |
| Subtotal .....                     | 2,172               | 1,395          | 1,327         | 1,327                            |                       | 1,327           |
| Not Completed—Mail Questionnaire   |                     |                |               |                                  |                       |                 |
| Unusable Address .....             | —                   | —              | —             | —                                | 41                    | 41              |
| Post Master Return .....           | —                   | —              | —             | —                                | 85                    | 85              |
| Returned Blank .....               | —                   | —              | —             | —                                | 18                    | 18              |
| Returned Unusable .....            | —                   | —              | —             | —                                | 1                     | 1               |
| Not Returned .....                 | —                   | —              | —             | —                                | 676                   | 676             |
| Other Not Mailed .....             | —                   | —              | —             | —                                | 133                   | 133             |
| Subtotal .....                     |                     |                |               |                                  | 954                   | 954             |
| Total Interviews Completed .....   | 5,075               | 717            | 64            | 5,856                            | 373                   | 6,229           |

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

<sup>b</sup> Includes households that moved after initial contact.

— Data not applicable.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, 1987 Residential Energy Consumption Survey.

nonrespondents. As a result of this effort, 373 additional households responded. After three waves of personal interview attempts and the mailed questionnaire, 954 households or 13.3 percent of all eligible housing units had not responded.

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

- Approximately 82 percent of the households were contacted and agreed to be interviewed personally. An additional 5 percent of the sample households completed and returned mailed questionnaires.
- Of the 6,229 responses, 81.5 percent were obtained during the first wave of contacts; 11.5 percent

were obtained during the second wave; and 1.0 percent resulted from third-wave contacts. Some 6.0 percent were responses to the mailed questionnaire.

- Of all households that participated in the personal interviews, 31.8 percent required only one visit in the first wave and 71.0 percent were completed with no more than two first-wave callbacks.
- A total of 366 personal interviews were completed in the second and third waves with respondents who had previously refused to participate, representing 6.3 percent of all completed personal interviews. In addition, of the 373 mailed questionnaires that were completed and returned, 286 were from households that previously refused to participate.

## Response Rates and Household Characteristics

This section of the report compares various response and nonresponse rates across Census region, location type, and housing structure type. These rates are reported in Table A8.

Several patterns are clear from Table A8. First, personal interviews enjoyed the most success in the South Region (84.0 percent), in non-MSA areas (85.6 percent), and among residents of single family or mobile homes (82.3 percent). Conversely, the interviewers had their lowest success rates in the Northeast Region (79.0 percent), metropolitan areas (central city) (79.8 percent), and in buildings with five or more residential units (79.4 percent). When looking at the categories comprising these groupings it is important to remember that their characteristics are not necessarily independent. Rather, they are very likely to overlap; for example, large apartment buildings are concentrated in metropolitan areas.

The total response-rate patterns with regard to highest and lowest rates generally are not affected by adding the mailed-questionnaire responses; however, the overall range from highest to lowest decreases by one to two percentage points. The response to the mail ques-

tionnaire tended to be higher in areas where the refusal rate to the personal interview was the highest.

Overall response rates are approximately four percentage points higher for new rotation groups (households not contacted for an earlier RECS) than for returning rotation groups. Conversely, refusal rates are approximately four percentage points higher for the returning rotation groups that had been contacted in an earlier RECS or companion survey, Residential Transportation Energy Consumption Survey (RTECS). These findings replicate results for earlier RECS.

## Data Editing

Completed interviews were mailed by the interviewers to the survey contractor headquarters. The first step in the review process was to verify the accuracy of the basic identifying information. Next, the questionnaires were manually reviewed by two editors to ensure completeness and the logical consistency of selected patterns of responses, and to prepare the questionnaires for translation into machine-readable form. Keypunching of the data was 100 percent verified. Finally, the data were machine edited to further ensure completeness, logical consistency, and the legitimacy of coded values. The computer editing utilized a proprietary software package called EDITOR II.

**Table A8. Response Rates for Region, Location, Type of Structure, and Rotation Groups**  
(Percentage of Eligible Housing Units)

| Characteristic                       | Response Rates     |                    |                | Personal Interview Nonresponse Rates |                   |
|--------------------------------------|--------------------|--------------------|----------------|--------------------------------------|-------------------|
|                                      | Personal Interview | Mail Questionnaire | Total Response | Refuse                               | Unable to Contact |
| <b>Total</b> .....                   | 81.5               | 5.2                | 86.7           | 14.0                                 | 4.5               |
| <b>Census Region</b>                 |                    |                    |                |                                      |                   |
| Northeast .....                      | 79.0               | 5.7                | 84.7           | 16.3                                 | 4.7               |
| Midwest .....                        | 80.7               | 5.9                | 86.6           | 15.1                                 | 4.2               |
| South .....                          | 84.0               | 4.2                | 88.2           | 11.7                                 | 4.3               |
| West .....                           | 81.8               | 5.1                | 86.9           | 13.3                                 | 4.9               |
| <b>Location Type</b>                 |                    |                    |                |                                      |                   |
| MSA--Central City .....              | 79.8               | 5.2                | 85.0           | 14.4                                 | 5.8               |
| MSA--Outside Central City .....      | 80.4               | 6.0                | 86.4           | 15.6                                 | 4.0               |
| Non-MSA .....                        | 85.6               | 4.1                | 89.7           | 10.9                                 | 3.5               |
| <b>Structure Type</b>                |                    |                    |                |                                      |                   |
| Single-Family or Mobile Home .....   | 82.3               | 5.4                | 87.7           | 14.5                                 | 3.2               |
| Buildings with Two to Four Units ..  | 80.1               | 3.9                | 84.0           | 12.4                                 | 7.5               |
| Buildings with Five or More Units .. | 79.4               | 5.4                | 84.8           | 13.0                                 | 7.6               |
| <b>Sample Rotation Group</b>         |                    |                    |                |                                      |                   |
| Returning Rotation Group .....       | 79.5               | 5.2                | 84.7           | 16.3                                 | 4.2               |
| New Rotation Group .....             | 83.5               | 5.1                | 88.6           | 11.7                                 | 4.8               |

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, 1987 Residential Energy Consumption Survey.

The contractor attempted to resolve inconsistencies or ambiguities in the data internally, by reference to other parts of the questionnaire. When these efforts failed to resolve an important problem, particularly those involving heating fuels or heating equipment and/or relationships between questionnaire responses, the contractor made a followup contact with the rental agent or a telephone contact with a member of the household in question. Telephone contacts with a household member were completed with approximately 1 percent of households during the course of data editing for this survey.

## Survey Estimates

All the statistics published in this report are estimates of population values, such as the total amount of energy consumed in the residential sector. These estimates are based on a randomly chosen subset of the entire population of households. The universe includes all households in the 50 States and the District of Columbia, including households on military installations. The definition of "households" is the same as that used by the U.S. Bureau of the Census. At the time of this RECS, November 1987, the universe was estimated to contain 90,537,000 households, based on the Current Population Survey (CPS) estimates of the population.

There are two major types of nonresponse--for an entire sampled household (unit nonresponse), or for a particular item of interest from a responding household (item nonresponse). The next two sections provide details on the procedures followed for each type of imputation. A third section deals with a special category of item nonresponse--the size of housing units in square feet.

### Adjustments for Unit Nonresponse

Weight adjustment was the method used to reduce unit nonresponse bias in the survey statistics. Weights were calculated for each sample household. The household weight reflected the selection probability for that household and additional adjustments. These adjustments included correcting for potential biases arising from the failure to list all housing units in the sample area and to contact all sample housing units. Contacts were not successful with 13.3 percent of the eligible units.

The adjustment for these noninterviews was designed to spread the effects of nonresponse over the interviewed sample of households in the final cluster. The noninterview weight adjustment is equal to the number

of households in the ultimate cluster (interviews plus noninterviews) divided by the number of interviews. When the weight adjustment computed in this way was greater than 2.0, however, that part of the noninterview adjustment that exceeded 2.0 was spread over the remaining ultimate clusters in the PSU.

The failure to list all housing units in the field-listing task is a common problem in surveys of this type. The result is an undercount of housing units in the sample area and, hence, an underestimate of the number of households in the universe. The undercount in the 1987 RECS is in the range of 8 to 10 percent. This problem is treated in two ways in the RECS. One treatment occurs during the interviewing process. The second treatment occurs in the estimation process. During the interviewing stage, unlisted housing units or households are discovered by querying the household where interviews are conducted to determine if other households are present in the unit. In addition, the interviewer is instructed to conduct an interview at all housing units contained in the geographical area between the interviewed household and the next listed address. This tactic reduces the number of missed households but does not completely eliminate the noncoverage problem.

The noncoverage problem is also treated by using ratio estimation to adjust selected estimates of household counts to official population values. Ratio adjustment took place in two stages for the 1987 RECS. The first stage adjustment was computed from information for PSU's in NSR strata only. A separate factor was created for each of 20 cells (four regions classified by five home heating-fuel categories). The implementation of this factor reduced somewhat the amount of variance caused by the sampling of PSU's. The first-stage adjustment for Cell "c" is given by:

$$R_{1c} = N_c / M_c$$

where  $N_c$  is the total number of households (1980 Census population) in Cell c for all PSU's in RECS NSR strata (including those PSU's not selected for RECS).  $M_c$  is an estimate of  $N_c$  obtained from the 1980 Census data for the NSR PSU's that were selected for the 1987 RECS. In particular,  $M_c$  is given by the sum (over all NSR PSU's selected for RECS) of the product of the PSU sampling weight and the number of households in Cell c (1980 Census population) for the PSU.

For all observations in NSR PSU's, the households weights (adjusted for nonresponse) were multiplied by  $R_{1c}$  where c is the cell in which the observation falls.

The second-stage factor adjusted the weights (after the nonresponse adjustment and the first-stage adjustment) from the survey so that the sum of the weights in the

12 categories shown in Table A9 will equal the CPS estimates for the population in the 12 categories. The second-stage adjustment for Category k is given by:

$$R_{2k} = H_k / G_k$$

where  $H_k$  is the CPS estimate of the number of households in Category k, and  $G_k$  is the sum of the RECS households weights before the second-stage ratio adjustment (after nonresponse adjustment and the first-stage adjustment) over all households in Category k.  $H_k$  is based on a linear interpolation of values for each of the 12 cells between CPS estimates for March 1987 and March 1988.

For all observations, the households weights (adjusted for nonresponse and the first-stage adjustment) were multiplied by  $R_{2k}$  where k is the category in which the observation falls. This second-stage factor reduced both the between-PSU variance and the within-PSU variance.

The third stage in the weight adjustments was similar to the second stage. The only difference was that instead of the 12 categories used in the second stage, the following 3 categories were used:

- One-person households, male householder,
- One-person households, female householder,
- All other households.

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

The fourth and final stage in the weight adjustments was exactly like the second stage. The final household weights will (for each of the categories in Table A9) sum to the control totals shown in that table.

### **Adjustments for Item Nonresponse**

Item nonresponse occurs when respondents do not know the answer or refuse to answer a question, or when an interviewer does not ask a question or does not record an answer. Imputations were made for nonresponse on about two-thirds of the items for which some nonresponse occurs, including most items to be used for making national estimates. Items for which national estimates are made, but for which imputations were not made, include questions on the presence, type, and amount of attic and floor insulation; thermostat settings; and the presence of wall insulation. For these items, no variables existed where correlations with the missing item were strong enough upon which to base an imputation procedure.

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

Less frequently used imputation methods included regression estimates, random selection from the known values of a variable, and deductive and allocation procedures. Regression procedures were used to impute the total square footage of the housing unit when actual measurements were missing. Discussion of the regression procedure and other imputations involved in the square footage estimates is found in the following section "Estimates of Housing Unit Size."

The random selection procedure was used primarily to assign dates (month and/or year) when those responses were missing, and to impute for missing numbers that were conditional on other numbers (e.g., number of storm windows, conditional on total number of windows).

Deductive procedures were used primarily for missing information on fuels used for specific purposes and methods of payment for fuel uses. The amount of missing data on these items was generally quite small; other

**Table A9. Population Estimates Used as Controls in Ratio Estimates**

| Census Region                    | Thousand Households |                          |               |               |
|----------------------------------|---------------------|--------------------------|---------------|---------------|
|                                  | MSA—Central City    | MSA—Outside Central City | Non-MSA       | Total         |
| Northeast .....                  | 6,653               | 10,173                   | 2,223         | 19,049        |
| Midwest .....                    | 6,700               | 9,112                    | 6,447         | 22,259        |
| South .....                      | 9,426               | 12,710                   | 8,769         | 30,905        |
| West .....                       | 6,868               | 8,607                    | 2,849         | 18,324        |
| <b>Total United States .....</b> | <b>29,647</b>       | <b>40,602</b>            | <b>20,288</b> | <b>90,537</b> |

Note: See "Glossary" for definition of MSA and Non-MSA.

Source: Estimates derived from the March 1987 and March 1988 Current Population Surveys, U.S. Bureau of the Census.

available information in the questionnaire, or from related data sources (utility bills and rental agent survey), provided reasonably conclusive assignments for the missing data.

Allocation procedures involved the use of explicit rules to assign values in place of missing information on relationship to householder, and age and sex of persons in household, based on the configuration of known information on these variables for other household members.

The numbers of questionnaire items for which various types of imputation procedures were used are shown below.

| Imputation Method | Number of Questionnaire Items |
|-------------------|-------------------------------|
| Not Imputed       | 150                           |
| Imputed           | 272                           |
| Hot-deck          | 116                           |
| Random            | 62                            |
| Deductive         | 59                            |
| Allocation        | 35                            |
| Total*            | 422                           |

\*Excludes 45 items for which missing values, if any, are determined by explicit editing rules in the initial stages of questionnaire editing.

Table A10 shows the most frequently imputed items, the number of cases requiring imputation, and the method used.

The amount of item imputations for the 373 mailed questionnaires was considerable since the mailed questionnaire contained only a small subset of questions from the household interview. For the mailed questionnaire, a modified hot-deck imputation method was used. A hot-deck matrix was created for both mailed questionnaire and personal-interview households using Census region, type of housing unit structure, space-heating fuel, hot-water fuel, and presence and type of air conditioning. Whenever possible, a donor personal-interview household was chosen for each mailed-questionnaire household from the same cell of the hot-deck matrix. For 95 percent of the mailed questionnaires, donors matched on all hot-deck variables.

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



*This single-family detached housing unit is an example of some of the housing structures included in the RECS.*

**Table A10. Items Most Frequently Imputed**

| Imputed Item  | Cases Imputed | Percentage of Total Sample <sup>a</sup> (5,856) | Method of Imputing | Question Number on Questionnaire |
|---|---------------|---|--------------------|----------------------------------|
| 1987 Family Income .....  | 665           | 11  | Hot-deck           | 109                              |
| Main Fuel Same as in November 1984 .....  | 472           | 8   | Hot-deck           | 9                                |
| Year House Was Built .....  | 454           | 8   | Hot-deck           | 3                                |
| Availability of Natural Gas .....   | 354           | 7   | Hot-deck           | 122                              |
| Roof or Ceiling Insulation Added Since September 1985 .....                           | 211           | 4   | Hot-deck           | 60                               |
| Insulation Added Between House and Basement or Crawl Space Since September 1985 ..... | 166           | 3   | Hot-deck           | 66a                              |
| Lower Rent Due to Government Aid .....  | 162           | 3   | Hot-deck           | 119                              |
| Storm Doors for Non-sliding Doors Added Since September 1985 .....                    | 135           | 2   | Random             | 48b                              |
| Storm Windows Added Since September 1985 .....  | 126           | 2   | Random             | 52                               |
| Warm Air Forced Through Ducts .....   | 107           | 2   | Hot-deck           | 14                               |
| Heating System Broken Last Winter .....   | 104           | 2   | Hot-deck           | 25a                              |
| Basement or Crawl Space Heated .....  | 95            | 2   | Hot-deck           | 170                              |
| Square Feet of Housing Unit .....   | 71            | 1   | (b)                | --                               |
| No Heat from Landlord Last Winter .....   | 65            | 1   | Hot-deck           | 24a                              |
| Ran Out of Bulk Fuel Last Winter .....  | 64            | 1   | Hot-deck           | 23a                              |
| Marital Status of Householder .....   | 64            | 1   | Hot-deck           | 103                              |
| Utility Shut Off Fuel Last Winter .....   | 62            | 1   | Hot-deck           | 22a                              |
| Month Caulking Was Added .....  | 60            | 1   | Random             | 67e                              |
| Age of Householder .....  | 60            | 1   | Allocation         | 96                               |
| Government Assistance in Paying Cooling Costs ..                                      | 57            | 1   | Hot-deck           | 111b                             |
| Government Assistance for Other Energy Costs ..                                       | 57            | 1   | Hot-deck           | 111c                             |
| Condominium or Cooperative .....  | 57            | 1   | Hot-deck           | 116                              |
| Government Provided Other Energy Device .....   | 55            | 1   | Hot-deck           | 110h                             |
| Government Assistance in Paying Heating Costs ..                                      | 55            | 1   | Hot-deck           | 111a                             |
| Hot Water Equipment Heat Water for Other Units .....                                  | 52            | 1   | Hot-deck           | 37                               |
| Age of Second Household Member .....  | 52            | 1   | Allocation         | 96                               |
| Government Provided Furnace Tuneup .....  | 52            | 1   | Hot-deck           | 110g                             |
| Month Storm Windows Were Added .....  | 51            | 1   | Random             | 53                               |
| Caulking Added Since September 1985 .....   | 51            | 1   | Hot-deck           | 66e                              |
| Month Weather Stripping Was Added .....   | 51            | 1   | Random             | 67f                              |
| Government Provided Furnace Repairs .....   | 51            | 1   | Hot-deck           | 110f                             |
| Employment Status of Third Household Member .....                                     | 50            | 1   | Hot-deck           | 96                               |
| Government Repaired Broken Windows or Doors .....                                     | 50            | 1   | Hot-deck           | 110c                             |

\* Mailed questionnaires are not included in the percentage. To account for these, add five percentage points to the percentage points given.

<sup>b</sup> See section on "Estimates of Housing Unit Size."

-- Data not available.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, 1987 Residential Energy Consumption Survey.

### **Estimates of Housing Unit Size**

Interviewers for the 1987 RECS were given a retractable 50-foot metal tape measure to ascertain the dimensions of housing units. The instructions were to measure the "area enclosed from the weather." This included garages attached to the house, attics either heated or finished, and basements enclosed from the weather (see "Square Feet" in "Glossary" for further definition). Interviewers indicated on a rough-drawn diagram of the floor plan which areas were heated and unheated and recorded the dimensions of the heated areas and the unheated areas. This finer breakdown into heated and unheated areas more closely measures the floorspace of the housing unit that places the demand on the heating system and, therefore, is the figure that may prove to be more useful in analyzing residential energy consumption. All measurements were rounded to the nearest foot by the interviewer or in the editing process. Interviewers were given an option of measuring the home from the inside, taking into account the thickness of inside walls, or from the outside.

Interviewers were instructed to measure all housing units including units in the returning Rotation Groups C and D, even if there exists complete measurements taken in the 1984 RECS. (See Longitudinal Sample section earlier in this Appendix for a discussion of Rotation Groups.) The subsample of households in Rotation Groups C and D with complete measurements in 1984 and 1987 will serve as the basis for further methodological analyses of differences between 1984 RECS and 1987 RECS measurements. (See Appendix C, "Quality of the Data" for a brief comparison of the two measurements.)

Interviewers attempted to measure the size of all 5,856 housing units where personal interviews were conducted. In 5,785 cases, usable measurements were acquired or were available from data collected during the 1984 RECS. In 71 cases, the measurements either were not usable or were not made. Although most cases contained the basic information, some imputa-

tions were required to produce a final set of three square footage amounts for each housing unit:

**HOMEAREA** = total square footage of floorspace enclosed from the weather

**HEATED** = total square footage of heated floorspace

**UNHEATED** = **HOMEAREA** - **HEATED** =  
total square footage of unheated floorspace

Table A11 indicates the number of cases with missing data. The imputations required standardizing all measurements to outside measurements when the measurement was made from inside the home, characterizing a measurement as inside or outside when this was unknown, apportioning the total space between heated and unheated when this proportion was unknown or partially known, and estimating the total square footage when the measurements were not made or not usable.

The following 3 sections describe the procedures followed for each of the three major categories of data. The final section provides a comparison of the measurements from the 1984 and 1987 RECS.

#### Treatment of Housing Units with Complete Measurements

As shown in Table A11, 4,272 homes had complete dimensions for all enclosed areas and information on which areas are heated and which areas are unheated.

The only adjustment required for these cases was to scale up the measurements for the 1,794 homes that were measured on the inside. The inside measurements were standardized to outside dimensions. The scaling factor was determined for each housing unit as a function of the floorspace of the first floor, the total floorspace of the home, and the housing unit type. The formula for the scale factor (SCALE) is given below:

$$SCALE = 1.0955$$

$$-.00004359 \times FSFF$$

$$+.000021795 \times TFS$$

$$-.07875 \times IMH$$

$$+.02745 \times ISAH.$$

Where:

FSFF is the floorspace of the first floor,

TFS is total floorspace of the home,

IMH is the indicator variable for the mobile home and,

ISAH is the indicator variable for the single family attached home.

The above equation indicated that the scale factor varies by the floorspace of the first floor, the total floorspace, and the type of dwelling. In particular, the scale factor is reduced when the dwelling is a mobile

**Table A11. Completeness of Data on Square Footage of Housing Units**

| Amount of Information Collected  | Number of Households | Percent |
|--|----------------------|---------|
| Complete Set of Dimensions .....   | 4,272                | 73      |
| Outside Measurement of Home .....  | 2,478                | 42      |
| Inside Measurements of Home .....  | 1,794                | 31      |
| Partial Information  |                      |         |
| Information available on heated and unheated areas.  |                      |         |
| Unknown whether dimensions are for inside or outside of home .....   | 1,213                | 21      |
| Total floorspace known but information on heated and unheated areas is missing. Also may be unknown whether dimensions are for inside or outside of home .....         | 157                  | 3       |
| Basement dimensions missing .....  | 62                   | 1       |
| Complete set of dimensions for all floors except basement. Basement total floorspace known, but information on heated and unheated areas for basement is missing ..... | 65                   | 1       |
| Values for heated and unheated were taken from 1984 RECS data .....  | 16                   | 0       |
| All dimensions missing or unusable .....   | 71                   | 1       |
| Total .....  | 5,856                | 100     |

Note: The floorspace for the 373 households responding by mail was imputed through a hot-deck procedure. These mail questionnaires are not included in this table.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, Form EIA-457A, 1987 Residential Energy Consumption Survey.

home and is increased when the dwelling is a single-family attached home. For dwellings with only one floor, the scale factor decreases as the floorspace increases. For dwellings with more than one floor, the scale factor decreases as the floorspace of the first floor increases. The scale factor increases as the floorspace of the remaining floors increases.

These scale factors, which increased the inside measurements, ranged from 1.01 to 1.17. Ninety percent of the scale factors were between 1.067 and 1.130. If the equation resulted in a scale factor of less than 1.0, the scale factor was set equal to 1.01. There was no upper bound placed on the scale factor.

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

#### Treatment of Housing Units with Some Missing Data

The 1,213 cases lacking information as to whether the measurements were inside or outside, or a combination of inside and outside, were treated as though measurements were outside. This was because average predictions based on regression equations using homes measured outside matched average totals for this group very closely, while predictions based on regression equations using homes measured inside were seriously biased on the low side.

The 157 cases lacking information on the ratio of heated to unheated space borrowed that ratio from housing units with complete data, on a PSU-by-PSU basis. For most of these cases, information was also lacking as to whether the measurements were inside or outside, and measurements were again assumed to be outside. In 7 of these 157 cases, the measurements were known to be inside measurements and scale factors were used to increase the floorspace estimates.

For the 62 cases with missing basement dimensions, the basement floorspace was imputed by using a simple regression based on the floorspace of the first floor. The heated and unheated areas were determined or imputed and then added to known totals for the remaining floors. In 20 of these 62 cases, the measurements for the remaining floors were known to be inside measurements and scale factors were used to increase the floorspace estimates.

There were 65 cases in which the ratio of heated to unheated space for the basement was unknown. This

ratio was imputed by using an appropriate empirical distribution of heated to unheated ratios. Three such distributions were used: one for single-family homes with basements only; one for homes with a basement plus crawl space and/or slab; and one for basements of homes in buildings with two to four units. In 11 of these 65 cases, the measurements were known to be inside measurements and scale factors were used to increase the floorspace estimates.

#### Treatment of Housing Units with No Usable Measurements

A regression equation was used for the 71 cases with no usable data. After HOMEAREA had been imputed by using the regression equation, the ratio of heated to unheated space was imputed using the same procedures described above for housing units for which that ratio was missing.

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

### Supplemental Data Collection for the Family Support Administration

Portions of the 1987 RECS data set and analyses are based on a supplemental data collection carried out by telephone in mid-1988. The primary purpose of this followup activity was to collect additional information of interest to the Family Support Administration on government assistance to low-income households for use in program administration of the Low-Income Home Energy Assistance Program (LIHEAP).

The supplemental data collection was carried out entirely by telephone in May 1988. Telephone contacts for this purpose were combined, whenever possible, with the midyear contact for the 1988 RTECS. Information was collected on government assistance to low-income households to pay heating costs for the period from October 1, 1987 to March 31, 1988.

A household was eligible for the supplemental survey if: the income question in the 1987 RECS was not answered; the income of the family was less than \$30,000 and less than 175 percent of the federal LIHEAP eligibility guideline; the income of the family was less than 125 percent of the federal LIHEAP eligibility guideline; or if the household reported receiving LIHEAP or public assistance during the 1987 RECS.

interview. Of the 3,831 households included in this group, 2,385 (62.3 percent) followup interviews were completed. Nonrespondents included households with no phones, households that could not be reached or refused to be interviewed, and households that could not be reached or refused earlier RTECS contacts.

## Fuel-Supplier Survey

The overall objective of the fuel-supplier survey was to provide data on which to estimate the annual fuel consumption and expenditures of sample households. Five fuels were covered in the supplier survey—electricity, natural gas, fuel oil, kerosene, and LPG.<sup>8</sup> For each of the fuels, the goal was to obtain complete consumption records from January 1, 1987 through December 31, 1988.

Toward the end of the household interview, each household reported for each use of the fuel whether or not the fuel was paid for by the household, included in rent, or paid another way. For the households that paid directly, the respondent was asked for the names, addresses, and telephone numbers of the fuel companies supplying the household; these respondents were also asked to sign a form, authorizing the contractor to collect consumption data from the suppliers.

Altogether, the fuel-supplier survey included initial contact attempts with 1,025 companies. The number of companies in the survey supplying each fuel and the

total number of households supplied are shown in Table A12.

## Data Collection Procedures

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

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

**Table A12. Companies in Fuel-Supplier Survey and Number of Households Supplied**

| Fuel Supplier              | Number of Companies* | Number of Households with Companies Identified |
|----------------------------|----------------------|--|
| Electricity .....          | 266                  | 5,345  |
| Natural Gas .....          | 138                  | 3,068  |
| Fuel Oil or Kerosene ..... | 440                  | 636  |
| Kerosene .....             | 72                   | 98   |
| LPG .....                  | 205                  | 440  |

\* The total number of companies in the survey was 1,025. 41 supplied both electricity and natural gas; 14 supplied fuel oil and LPG; 28 supplied fuel oil and kerosene; 3 supplied LPG and kerosene; and 5 supplied LPG, fuel oil, and kerosene.

Notes: • The fuel-oil figure excludes 24 households with suppliers unknown and 9 households whose estimates of fuel-oil quantities were based mainly on cash-and-carry purchases. • The kerosene figure excludes 7 households with suppliers unknown and 206 households whose estimates of kerosene quantities were cash-and-carry purchases. • The LPG figure excludes 9 households with suppliers unknown. • Households were asked for names of their "fuel oil or kerosene" suppliers. • For those households using both fuels and more than one supplier, it was not possible to determine which fuel was purchased from a given supplier until data were received.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, 1987 Residential Energy Consumption Survey.

<sup>8</sup>Households using LPG only for outdoor cooking grills were not included in the LPG data collection; LPG used by these households is excluded from consumption and expenditures estimates. Data on usage of wood fuel were reported by the household, since it was not practical to collect these data from suppliers as is done with the major home fuels. Unless otherwise noted, consumption of wood is not included in the tables for this report.

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

Procedures for fuel oil or kerosene and LPG dealers were the same as for electric and natural gas companies up through and including the mailing of survey materials to the company person named as the contact. These companies, however, most often had only one or two households for which information was to be supplied, and data collection was generally completed by telephone. A pretest of the procedure conducted earlier had indicated a somewhat greater likelihood that companies would respond by telephone than as a result of a request to complete and return the forms by mail.<sup>9</sup> Companies that chose to return the forms by mail, however, were not discouraged from doing so.

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

## Data-Collection Dates

The first set of advance letters was mailed to utility companies in late January 1988. The cutoff date for receipt of usable information was October 30, 1988.

## Nonresponse Statistics

The proportion of households that did not sign authorization forms (access to records denied) was in the range of 1 to 9 percent for the five fuels. Most households that signed authorization forms did so at the time of the personal interview or at the time of completing the mailed questionnaire. To maximize the number of households with records, however, a followup request was mailed to those who did not sign a form at the time of the personal interview. About 19 percent of this group returned signed forms in response to the mail request and, therefore, were included in the fuel-supplier survey.

Table A13 shows that factors affecting nonresponse are somewhat different for fuel oil, kerosene, and LPG than they are for electricity and natural gas. The most frequent reasons for nonresponse for households using

fuel oil, kerosene, or LPG were that the company was unknown or not contacted and that the dealer could not identify the customer. A number of factors contribute to this nonresponse. First, many customers purchase fuel from a number of dealers on a cash and carry basis. Second, some customers use several different fuel suppliers and pay cash for deliveries. In both cases, few records are kept and efforts to get consumption records for households rarely are successful.

Refusal of companies to participate in the survey was not a significant factor.

Some additional factors related to the quality of fuel records are discussed in the following section on data processing and imputations.

## Data Processing

The energy consumption and expenditure statistics presented in this report are based on the individual annual consumption and expenditures amounts for each household. Individual consumption and expenditure amounts are calculated for each household for each of five fuels (electricity, natural gas, fuel oil, kerosene, and LPG). None of the households that participated in the 1987 RECS used all five fuels, but the majority of the households did use two or more fuels. When possible, the annual consumption and expenditure amounts were calculated using data obtained from the fuel-supplier survey.

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

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

<sup>9</sup>The test is described in *RECS: Consumption and Expenditures - April 1980 Through March 1981, Part 1: National Data*, DOE/EIA-0321/1 (Washington, D.C., September 1982), Appendix A, "How the Survey Was Conducted."

**Table A13. Energy-Consumption Records and Missing Data for Survey Households Using Electricity, Natural Gas, Fuel Oil, Kerosene, or LPG**  
 (Percentage of Households Using the Fuel)

| Survey Households  | Electricity      | Natural Gas      | Fuel Oil       | Kerosene       | LPG            |
|--|------------------|------------------|----------------|----------------|----------------|
| Total Households Using the Fuel<br>(Sample Number).....                      | 100.0<br>(6,228) | 100.0<br>(3,991) | 100.0<br>(952) | 100.0<br>(414) | 100.0<br>(543) |
| Usable Records Received from Fuel Supplier <sup>a</sup> .....                | 82.8             | 73.4             | 55.4           | 11.4           | 63.5           |
| Quantity Estimated by Household <sup>b</sup> .....                           | (*)              | (*)              | 0.3            | 57.7           | 0.4            |
| Unusable Records Received from Fuel Supplier .....                           | 0.9              | 1.9              | 7.0            | 2.7            | 8.7            |
| Household Pays Supplier Directly—No Record Available for the Household ..... | 8.8              | 7.9              | 13.0           | 28.0           | 21.9           |
| Household Not Identified in Company Records .....                            | 2.1              | 1.3              | 3.4            | 1.7            | 5.9            |
| Company Refused to Participate .....   | (*)              | (*)              | (*)            | (*)            | (*)            |
| Company Unknown or Not Contacted .....                                       | (*)              | 0.3              | 3.3            | 25.3           | 7.2            |
| Authorization Form Not Signed .....  | 6.7              | 6.3              | 6.3            | 1.0            | 8.8            |
| Fuel Used Included in Rent or Paid in Other Way <sup>c</sup> .....           | 7.5              | 16.8             | 24.3           | 0.2            | 5.5            |

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

<sup>b</sup> Households in this group are those that purchased kerosene primarily on a cash-and-carry basis. These households supplied estimated purchases of kerosene during the household interview. In addition, if a household indicated that it had the ability to use LPG, fuel oil, or kerosene - but planned no purchases during 1987 - the household was assigned zero consumption.

<sup>c</sup> These data exclude households that paid for some, but not all, uses of a fuel.

<sup>d</sup> Represents or rounds to zero.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, 1987 Residential Energy Consumption Survey.

Available but nonusable billing records occurred when; (1) the household recently moved into the dwelling unit; (2) the amount of the bill that could be attributed to the housing unit was unknown; or (3) the billing records did not cover the entire amount used by the household. The households were asked to provide estimates of consumption and expenditures for fuel oil, kerosene, and LPG only.

### Annualization

The consumption and expenditure data that were obtained from the suppliers did not list the annual amounts. Instead, the supplier provided the billing records (when available). These records listed the amount purchased, the cost of the purchase and the date of purchase. For natural gas and electricity, the amount purchased was usually equivalent to the amount consumed. The major exception occurred when the supplier had estimated the bill for the billing period. For fuel oil, kerosene, and LPG, the fuel purchased in 1987 may be consumed in 1988 instead of 1987. Conversely, the fuel consumed in 1987 may have been purchased in 1986. The procedures that were used to calculate the annual consumption and expenditure amounts for electricity and natural gas were designed to avoid estimated bills when possible. The an-

nual consumption and expenditure amounts for fuel oil, kerosene, and LPG reflected the amounts purchased. No attempt was made to distinguish between the amount purchased and the amount consumed for fuel oil, kerosene, and LPG. See Appendix C, "Quality of the Data" for more details on the annualization of consumption and expenditures.

### Usable Records

Table A13 shows the percentage of cases where usable and nonusable records were obtained by fuel. For example, out of a total of 6,229 households that participated in the 1987 RECS, 6,228 used electricity. For 82.8 percent of these cases, the electric utilities provided usable billing records. On the other hand, 414 sample households used kerosene. For 11.4 percent, the kerosene supplier provided usable kerosene billing data.

Households lacking consumption records because they do not pay fuel bills directly to fuel suppliers occur most frequently among users of natural gas and fuel oil (see Table A13). These households are 16.8 percent of users of natural gas and 24.3 percent of users of fuel oil.

## **Imputations**

Not all the fuel records that were collected in the fuel-supplier survey could be used. For example, some records covered too few months and other records were incomplete. The extent of these nonusable records is shown in Table A13. The problem of nonusable records is small for the metered fuels (electricity and natural gas) since the partial-year records of electricity and natural gas were considered usable. For fuel oil, kerosene, and LPG, the problem of nonusable records was more serious, since 7.0 percent of fuel oil, 2.7 percent of kerosene, and 8.7 percent of LPG records were nonusable. Partial-year records for these fuels were not acceptable.<sup>10</sup> See Appendix C, "Quality of the Data", for more details on imputation for supplier records.

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

## **Consumption**

Households with nonusable records, as described earlier, and households with no records had their annual energy consumption imputed using nonlinear regression techniques. The equations were developed using RECS sample households that had approximately a full year of acceptable data. Separate regression equations were developed for the five fuels: electricity, natural gas, fuel oil, kerosene, and LPG. These equations are described in Appendix B, "End-Use Estimation Methodology."

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

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

## **Expenditures**

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

## **Standard Electricity Price**

A standard electricity price, defined as the potential cost to the customer of 1,000 kWh on a monthly basis was determined for each RECS household. An average price of electricity could be calculated for each RECS household that used electricity in their home. The average price equals the annual electricity expenditures divided by the total annual electricity consumption in kWh. This average price may vary between customers for the same utility, because if the utility has a decreasing block rate structure, the average price will decrease as the amount of electricity consumed increases. The standard electricity price was used to avoid this affect of the block rate structure.

There were two major sources for data on standard electricity prices: the EIA publication *Typical Electric Bills*, January 1, 1987, DOE/EIA-0040(87) published January 1988 was used for households that were located in communities with a population of 2,500 or more and were served by a investor-owned or a municipal-owned electric utility. Data from the Department of Agriculture was used for households that were served by a Rural Electric Co-operative that had borrowed money from the Rural Electrification Administration. The few utilities that were not listed in one of these two reports and who were supplying electricity to 1987 RECS households were contacted directly to obtain a standard electricity price.

The standard electricity price was attached to each 1987 RECS household record. Each household had a

<sup>10</sup>The number of households with partial-year records, as a proportion of total households using the fuel, is 9.2 percent for electricity and 6.2 percent for natural gas.

different random error added to the price before it was attached to the household record. The random error was used to protect the confidentiality of the household.

## Data Preparation for Report

Prior to the final data tape, a preliminary data tape was delivered to the EIA in January 1989. EIA data analysts reviewed and processed the data to prepare it for the final data tape. Crosstabulations were run to check for internal consistency and verified with data from previous RECS. Generally inconsistencies were resolved by the survey contractor. The publication *Housing Characteristics 1987* DOE/EIA-0314(87) was produced using the data from the January 1989 data tape.

A final edited data tape of household survey data and energy supplier survey data was delivered to the EIA in May 1989. When comparisons were made between the estimates of the January 1989 data tape and the May 1989 data tape, small differences were found in the number of households using a particular fuel for space heating, water heating, and cooking. None of the differences between the published numbers in the *Housing Characteristics 1987* and this report exceeded 0.1 million households.

The May 1989 data were compared using two different software programs, Table Producing Language (TPL) and Statistical Analysis System (SAS). Statistical tables

of aggregated data were produced and analyzed. This report text was based on these tables.

## Confidentiality of Information

The EIA does not receive or take possession of the names or addresses of individual respondents or any other individually identifiable energy data that could be linked with information describing the household. All identifiable information is maintained by the survey contractor. Additionally, all household records that are placed on the public use tape are masked for further confidentiality protection.

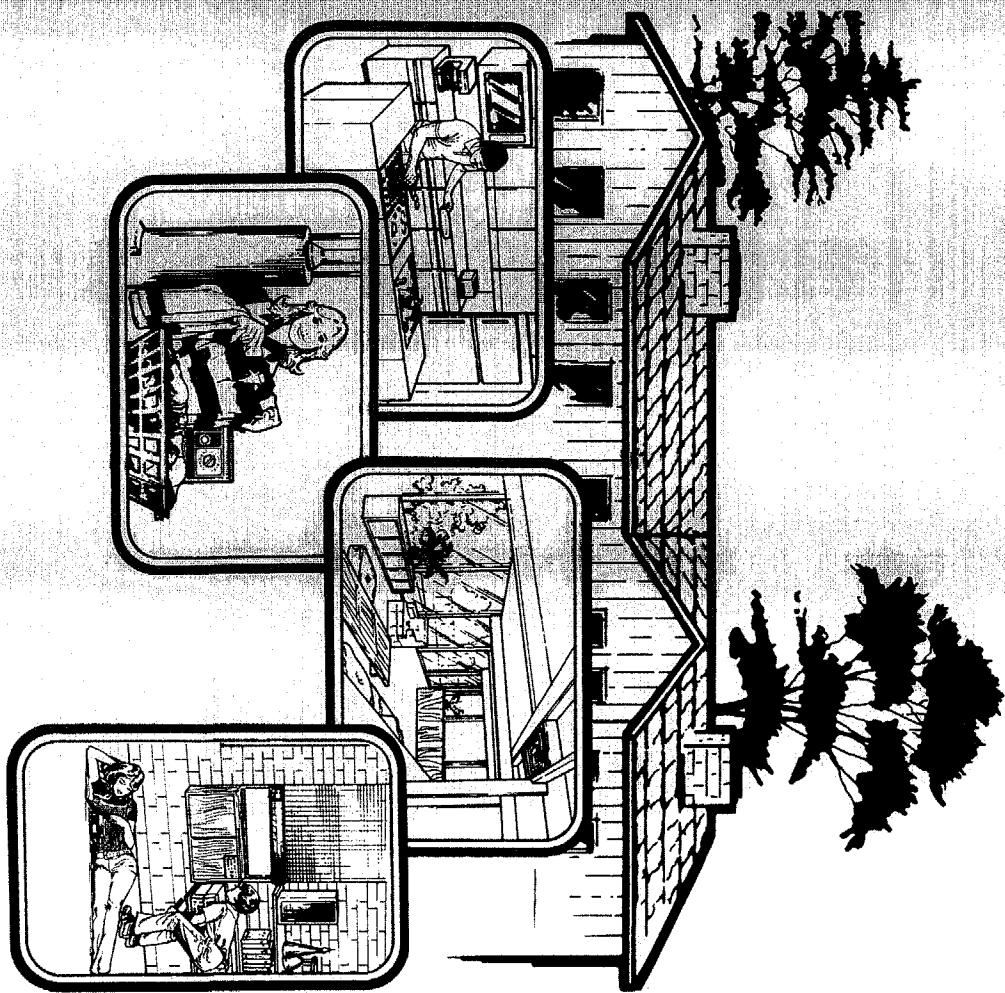
## Public Use Tape Preparation

Following the publication of the statistical reports for the RECS and the statistical report for the RTECS, further work is performed on the basic survey data at the microlevel to prepare the final data tape for release to the public. This tape contains both the housing characteristics and energy supplier data for the RECS and the household vehicle data for the RTECS. Measures were taken to mask the data to insure that the identity of the individual respondents is kept confidential. At the culmination of these procedures, a final data tape is released to the public through the National Technical Information Service (NTIS). (See Appendix G for information on how to order these tapes.)



## **Appendix B**

### **End-Use Estimation Methodology**





## **Appendix B**

# **End-Use Estimation Methodology**

### **Introduction**

For each household that responded to the 1987 RECS, the annual amount of energy used for four end-use categories (space heating, water heating, air conditioning, and general appliance usage) was estimated. The end-use estimates were produced for each of the five main fuels: electricity, natural gas, fuel oil, kerosene, and liquefied petroleum gas (LPG). The end-use amounts were not based on data produced by placing meters on individual appliances, rather the end-use amounts were obtained by estimating for each household the proportion of the total annual consumption for each fuel that can be attributed to each of the end-use categories.

For each fuel, the proportion of the annual consumption that can be attributed to each of the end-use categories was estimated by use of a regression equation. The regression equations used to estimate the proportions were the same equations that were used to impute energy consumption when the billing data were missing or were inadequate. A separate equation was developed for each of the five main fuels. In each equation, the dependent variable was the annual energy consumption for the 1987 calendar year.

For electricity and natural gas, the basic equation was:

$$\begin{aligned}\text{Total Consumption} = & \text{ Space-Heating Component} \\ & + \text{ Water-Heating Component} \\ & + \text{ Air-Conditioning Component} \\ & + \text{ General Appliance Component.}\end{aligned}$$

For fuel oil, kerosene, and LPG, the basic equation was the same as above except there was no air-conditioning component.

### **Space-Heating Component**

For all fuels, the space-heating component was defined as all energy used to generate heat by space-heating equipment. The equipment could be the main space-heating equipment or secondary space-heating equipment. Hence, for all fuels, a household could have had a positive amount of energy assigned to the space-heating component even if the fuel was not used as the main space-heating fuel. For electricity, in the 1987 RECS, the electricity associated with the operation of fans in any central forced-air heating equipment was assigned to the electricity appliance component and not to the space-heating component. This differed from the previous RECS where the electricity used to run fans for central forced-air heating systems was assigned to the space-heating component. The change was implemented so that the households that did not use electricity as a space-heating fuel (main fuel or a secondary fuel) by definition did not have positive amounts of electricity assigned to the space-heating component.

## **Water-Heating Component**

The component for water heating was defined as all energy used to heat water for hot running water, as well as water heated at point sources (such as stoves or auxiliary water-heating equipment) for bathing, cleaning and other noncooking applications of hot water. Energy used at point sources to heat water for cooking and hot drinks was considered part of the general appliance component. Energy used to heat water for a swimming pool was also considered as part of the general appliance component.

## **Air-Conditioning Component**

The electricity air-conditioning component was defined as all electricity associated with (1) electric air-conditioning equipment and (2) fans in any central air-conditioning equipment including natural gas air-conditioning equipment. The regression equation used with the 1987 RECS for electricity did not contain specific terms for whole-house fans, ceiling fans, window fans, and evaporative (swamp) coolers. Because the terms were only marginally significant, they were not used in the final regression. Hence, the consumption of electricity to operate these fans and evaporative coolers was not assigned to the air-conditioning component; it was included in the appliance component. This differs from the previous RECS where the regression equation for electricity included in the air-conditioning component a term for evaporative coolers, whole-house fans, ceiling fans, and window fans. As a result, in the 1984 RECS, the consumption of electricity to operate these types of coolers and fans was assigned to the air-conditioning component. Consequently, in the 1984 RECS, there existed households that did not have air-conditioning equipment, yet these households had positive amounts assigned to their air-conditioning component.

Another change in the air-conditioning component was that for the 1987 RECS, the households that reported that they had air-conditioning equipment but did not use the equipment, were assigned a value of zero for their electricity air-conditioning component. In the 1984 RECS, these households were assigned positive values for their electricity air-conditioning component.

The natural gas air-conditioning component was defined as all natural gas used to operate natural gas air-conditioning equipment. There was no air-conditioning component for fuel oil, kerosene, or LPG.

## **Appliance Component**

The general appliance component consisted of all energy not used specifically for any of the other end uses. This component included energy associated with refrigerators, freezers, lights, clothes dryers, cooking equipment, fans, evaporative coolers, and home entertainment equipment such as televisions, stereos, video cassette recorders, electronic games, and computers. In many households, the general appliance component for electricity equaled the total electricity consumption.

The appliance component for fuel oil was zero except for 9 households that used fuel oil for some end use other than space heating and water heating. Of these 9 households, 7 households used fuel oil for heating a swimming pool. Similarly, the appliance component for kerosene was zero except for 6 households that used kerosene for some end use other than space heating and water heating. One of these 6 households used kerosene as the main cooking fuel.

Energy used in general appliances during the winter will frequently help heat the housing unit. This secondary effect of the appliance consumption was not included in the estimation of the space-heating component. In addition, during the summer, energy used in general appliances may add to the load on the air-conditioning system. This was not included in the air-conditioning component.

## Nonlinear Regression Technique

The regression results were used to produce end-use estimates for the individual components for each household and each fuel. The end-use estimates were normalized so that the sum of the end-use estimates was equal to the actual or imputed yearly consumption for each fuel used by the household. As a result, the regression results were used only to estimate the proportion of energy used by each end use.

The individual household end-use estimates were used to estimate averages and totals for end-use consumption over selected household categories. The results are presented in the text and in the tables in the "Detailed Statistics" section of this report.

The nonlinear equations that were used in the end-use estimation procedure are described below. Care should be taken in interpreting the individual coefficients in the equations. For instance, the natural gas equations did not contain any variables that used natural gas prices directly. On the other hand, many variables were correlated with price. Additionally, many variables that were used in the equations were highly correlated with other variables. As a result, the value of a coefficient may reflect the effect of the characteristics that were highly correlated with the variable corresponding to the coefficient.<sup>11</sup>

An example of this type of positive correlation was the presence of a swimming pool and higher income. The coefficients in the electricity regression equation corresponding to variables involving swimming pools may have reflected the consumption of other appliances that were not contained in the equation and that were highly correlated with income.

The general form for the regression equations uses the following notation:

$$YCOM = SPHTCOM + WTHTCOM + AIRCCOM + APPLCOM,$$

where:

YCOM was the estimated annual consumption,

SPHTCOM was the estimated space-heating component,

WTHTCOM was the estimated water-heating component,

AIRCCOM was the estimated air-conditioning component, and

APPLCOM was the estimated appliance component.

The actual annual consumption was called Y. The unit of measure for Y and YCOM was thousands of Btu. This unit of measure was used for all fuels.

The error term was as follows:

$$e_1 = Y - YCOM.$$

Unfortunately, the variance of  $e_1$  tended to increase as YCOM increased. Furthermore, the distribution of  $e_1$  was skewed in the positive direction. These two facts violate the assumptions associated with linear least-squares regression. On the other hand, if

$$e_2 = \log(Y) - \log(YCOM),$$

<sup>11</sup>For a more detailed discussion of the end-use estimation procedures and the correlation of variables, see the *National Interim Energy Consumption Survey: Exploring the Variability in Energy Consumption*, DOE/EIA-072 (Washington, D.C., July 1981); the *National Interim Energy Consumption Survey: Exploring the Variability in Energy Consumption - A Supplement*, DOE/EIA-0272/S (Washington, D.C., October 1981); and *Residential Energy Consumption Survey: Regression Analysis of Energy Consumption by End Use*, DOE/EIA-0431 (Washington, D.C., October 1983).

then the distribution of  $e_2$  was closer to being normally distributed with a constant variance. Hence, it was decided to fit YCOM by using a nonlinear least-squares regression procedure that minimizes the sum of  $e_2$  squared.

For each fuel, the dependent variable was the consumption in thousands of Btu. The set of independent variables was not the same for all fuels.

The components consisted of sums or products of terms that themselves may again have been sums or products of the independent variables. The overall structure may seem complex at first glance, but there was a common structure. In general, the components consisted of an overall term multiplied by various adjustments. This format allowed the components to be adjusted by many factors. The relative size of the adjustments was easy to determine.

The disadvantage of the format was that it yields a basic equation that was intrinsically nonlinear. As a result, standard multivariate linear regression techniques could not be used to estimate the parameters. A nonlinear technique was used. The parameters were estimated by using the nonlinear regression procedure (PROC NLIN) contained in the statistical computer package, SAS.<sup>12</sup>

The equations are discussed below. All coefficients were obtained from the nonlinear regression equation unless otherwise noted. Natural gas is discussed first because the results of the natural gas regression were used to formulate independent variables for the other fuels.<sup>13</sup>

## Natural Gas Regression Equations

The regression equations for natural gas were as follows:

$$\text{SPHTCOM} = (\text{NGMAINHT} + \text{NGSECHEAT}) * \text{NGWHSHADJ} * \text{NGTOTADJ1} * \text{NGTOTADJ2},$$

$$\text{WTHTCOM} = \text{NGWATERHT} * \text{NGWHSHADJ} * \text{NGTOTADJ1} * \text{NGTOTADJ2}$$

$$\text{AIRCCOM} = \text{NGAIRCON} * \text{NGTOTADJ1} * \text{NGTOTADJ2},$$

and

$$\text{APPLCOM} = \text{NGAPPL} * \text{NGTOTADJ1} * \text{NGTOTADJ2}.$$

## Adjustment Factors

The terms NGTOTADJ1 and NGTOTADJ2 were adjustments that were applied to all of the natural gas components. NGTOTADJ1 adjusted for the demographic characteristics of the household. NGTOTADJ2 adjusted for the geographic location.

NGTOTADJ1 and NGTOTADJ2 were given by:

<sup>12</sup>Statistical Analysis System (SAS) Institute, (Cary, North Carolina).

<sup>13</sup>The terms used in the regression equations for all fuels are described in "Definitions of End-Use Variables" at the end of this appendix.

$$\begin{aligned}
 \text{NGTOTADJ1} = & 1 + (0.19703 * \text{BLACK}) \\
 & + (0.16014 * \text{BLACK} * \text{FEMLHEAD}) \\
 & + (0.10343 * \text{HIGHINCM}) \\
 & + (0.06163 * \text{GOODINCM} * \text{HH50PLUS})
 \end{aligned}$$

and

$$\begin{aligned}
 \text{NGTOTADJ2} = & 1 + (0.3772 * \text{ALASKA}) \\
 & - (0.1393 * \text{WHRZNONE} * \text{WESTNC}).
 \end{aligned}$$

The term NGWHSHADJ was an adjustment that was applied to the space-heating and water-heating components for natural gas. NGWHSHADJ adjusted for the type of housing unit, age of the housing unit, and income of the household.

NGWHSHADJ was given by:

$$\begin{aligned}
 \text{NGWHSHADJ} = & 1 - (0.1996 * (\text{APTUNIT} + \text{SFATTWOS})) \\
 & + (0.1581 * \text{POORHSLD} * \text{OLDHOME})
 \end{aligned}$$

## Space-Heating Component

The term NGMAINHT represented the use of natural gas as the main space-heating fuel. The term NGSECHEAT represented the use of natural gas as a secondary space-heating fuel.

NGMAINHT and NGSECHEAT were given by:

$$\begin{aligned}
 \text{NGMAINHT} = & \text{NGMHEAT} * \text{NGHTHDD} * \text{NGHTSZ} * \text{NGHTADJ1} * \\
 & \text{NGHTADJ2} * \text{NGHTADJ3} * \text{NGHTADJ4} * \text{NGHTADJ5} * \text{NGHTADJ6}
 \end{aligned}$$

and

$$\text{NGSECHEAT} = \text{NGSHEAT} * \text{NGSECHDD} * \text{NGSECHADJ1} * \text{NGSECHADJ2}.$$

The terms in NGMAINHT can be described as follows. NGMHEAT was an indicator variable that equaled one if natural gas was used as the main space-heating fuel. NGHTHDD was a function of heating degree-days. NGHTSZ was a function of the size of the housing unit. The remaining terms adjusted the space-heating component for the insulation characteristics of the housing unit, the type of main space-heating equipment, the amount of secondary space-heating, the age of the housing unit, the thermostat setting, and the presence of older household members.

NGHTHDD, NGHTSZ, NGHTADJ1, NGHTADJ2, NGHTADJ3, NGHTADJ4, NGHTADJ5, and NGHTADJ6 were given by:

$$\begin{aligned}
 \text{NGHTHDD} = & (0.02320 * \text{HDD60}) \\
 & + (2.743 * \text{SQRTHD60}),
 \end{aligned}$$

$$\begin{aligned}
 \text{NGHTSZ} = & (0.02483 * \text{HEATED}) \\
 & + (40 * \text{LOGHTSF}) \\
 & + (1.169 * \text{NUMROOMS} * \text{NUMROOMS}) \\
 & + (4.522 * \text{NUMBATHR} * \text{NUMBATHR}) \\
 & + (4.204 * \text{NDRSAWS}),
 \end{aligned}$$

$$\begin{aligned}
 \text{NGHTADJ1} = & 1 - (0.16475 * \text{BASEHEAT}) \\
 & + (0.11762 * (\text{PCTNOSTM}/100)) \\
 & - (0.08611 * \text{SF1SCSLB}) \\
 & - (0.06843 * \text{FULWAINS}),
 \end{aligned}$$

$$\begin{aligned}
 \text{NGHTADJ2} = & 1 - (0.4272 * \text{COOKSTVH}) \\
 & - (0.1260 * \text{SPHEATER}) \\
 & - (0.1703 * \text{SPHEATER} * (\text{MHTC6795} + \text{MHTC66MN})),
 \end{aligned}$$

$$\begin{aligned}
 \text{NGHTADJ3} = & 1 - (0.2975 * \text{MHTC66MN}) \\
 & - (0.1620 * \text{MHTC6795}),
 \end{aligned}$$

$$\begin{aligned}
 \text{NGHTADJ4} = & 1 + (0.21602 * \text{OLDHOME}) \\
 & + (0.06996 * \text{MD4059HM}) \\
 & - (0.23824 * \text{MD80PLUS}),
 \end{aligned}$$

$$\text{NGHTADJ5} = 1 + (0.07037 * \text{TEMPINDEX}),$$

and

$$\text{NGHTADJ6} = 1 + (0.1353 * \text{HVAD80PL}).$$

The terms in NGSECHEAT can be described as follows. NGSHEAT was an indicator variable that equaled one if natural gas was a secondary, but not the main space-heating fuel. NGSECHDD was a function of heating degree-days. NGSECHADJ1 was a term that adjusted for the type of equipment used for secondary heating. NGSECHADJ2 was a term that adjusted for the percentage of the heating load that was provided by the main space-heating fuel.

NGSECHDD, NGSECHADJ1, and NGSECHADJ2 were given by:

$$\text{NGSECHDD} = 391.6 * \text{SQRTHD60},$$

$$\text{NGSECHADJ1} = 1 - (0.4835 * \text{SECNGCKS}),$$

and

$$\text{NGSECHADJ2} = 1 + (0.4577 * (\text{MHTC66MN} + \text{MHTC6795})).$$

## Water-Heating Component

The term NGWATERHT represented the use of natural gas for water heating. NGWATERHT was given by:

$$\text{NGWATERHT} = \text{NGWHSIZE} * \text{NGWATADJ1} * \text{NGWATADJ2}.$$

The terms in NGWATERHT can be described as follows. NGWHSIZE expressed the consumption of energy for water heating as a function of the square root of the number of household members and the square root of the number of teenage household members. NGWATADJ1 was a term that adjusted NGWATERHT for the situation in which natural gas was only a secondary water-heating fuel or the household did not have hot running water. NGWATADJ2 was a term that adjusted NGWATERHT for the climate. NGWATADJ2 decreases as the number of cooling degree-days increases. Households in warmer climates should use less energy for water heating because the ground water should be warmer. NGWHSIZE, NGWATADJ1, and NGWATADJ2 were given by:

$$\begin{aligned}\text{NGWHSIZE} = & (15,598 * \text{SQRTNHMM}) \\ & + (1,651 * \text{SQRTEEN}),\end{aligned}$$

$$\begin{aligned}\text{NGWATADJ1} = & \text{NGWTHT} * \text{HVHTRUNW} \\ & + 0.6231 * (\text{NGSWTHT} + (\text{NGWTHT} * (1 - \text{HVHTRUNW}))),\end{aligned}$$

and

$$\text{NGWATADJ2} = 1 - (0.09455 * (\text{CDD65}/1000)).$$

## Air-Conditioning Component

Relatively few households used natural gas to operate air-conditioning equipment. Hence, the natural gas air-conditioning component was nonzero for only a few observations in the 1987 RECS. The experience gained in fitting the electricity air-conditioning component was used in determining the variable ACINDEX. In particular, this variable resembled the term ELACADJ3 in the electricity air-conditioning component. The natural gas air-conditioning component was given by:

$$\text{NGAIRCON} = 95.70 * \text{NGCACRMS} * \text{SQRTCD65} * \text{ACINDEX}.$$

## Appliance Component

The appliance component for natural gas contained terms that accounted for the use of natural gas for cooking, outdoor lights, pool heating, and clothes drying. NGAPPL was given by:

$$\begin{aligned}
 \text{NGAPPL} = & (3,612 * \text{SQRTNHMM} * (\text{NGCOOK} + \text{NGSCOOK})) \\
 & + (2,379 * \text{NGLIGHT} * \text{NUMROOMS}) \\
 & + (23,125 * \text{NGPOOLHT}) \\
 & + (3,118 * \text{NGDRYER} * \text{SQRTNHMM}).
 \end{aligned}$$

## **Electricity Regression Equations**

The regression equations that were developed for predicting the amount of electricity consumed for space heating, water heating, air conditioning, and appliance usage were as follow:

$$\text{SPHTCOM} = (\text{ELMAINHT} + \text{ELSECHEAT}) * \text{ELTOTADJ},$$

$$\text{WTHTCOM} = \text{ELWATERHT} * \text{ELTOTADJ},$$

$$\text{AIRCCOM} = \text{ELAIRCON} * \text{ELAPACADJ} * \text{ELTOTADJ},$$

and

$$\text{APPLCOM} = \text{ELAPPLTOT} * \text{ELAPACADJ} * \text{ELTOTADJ}.$$

## **Adjustment Factors**

The term ELTOTADJ was an adjustment that was applied to all electricity components. It adjusted all electricity components for the price of electricity. The term ELAPACADJ was an adjustment for the electricity appliance and electricity air-conditioning components. It adjusted the two components according to demographic characteristics. ELTOTADJ and ELAPACADJ were given by:

$$\text{ELTOTADJ} = 1 - (0.4607 * \text{LOGRELPC})$$

and

$$\begin{aligned}
 \text{ELAPACADJ} = & 1 + (0.08779 * \text{BLACK} * \text{FEMLHEAD}) \\
 & + (0.1256 * \text{HIGHINCM}).
 \end{aligned}$$

## **Space-Heating Component**

ELMAINHT and ELSECHEAT were subcomponents of the space-heating component. ELMAINHT represented the consumption of electricity for space heating when electricity was the main space-heating fuel. ELSECHEAT represented the consumption of electricity for space heating when electricity was only a secondary space-heating fuel. Both ELMAINHT and ELSECHEAT involve terms that were developed for the natural gas space-heating component. This was done for consistency and to take advantage of the results found while developing the natural gas equation. The number of observations where the main space-heating fuel was natural gas was much larger than the number where the main space-heating fuel was electricity. It was possible to estimate the coefficients for six adjustment terms using the natural gas data. The coefficients for the same terms could be estimated using the electricity data, but the smaller number of observations where electricity was the main space-heating fuel would mean

that the coefficients would not be as accurately estimated. It was decided to use the coefficients that were estimated using the natural gas data to calculate independent variables that were used in the electricity space-heating component.

**ELSECHEAT** and **ELMAINHT** were given by:

$$\text{ELSECHEAT} = 6.208 * \text{ELSHEAT} * \text{NGHTSZ}$$

and

$$\text{ELMAINHT} = 0.3971 * \text{ELMHEAT} * \text{NGHTHDD} * \text{NGHTSZ} * \text{NGHTADJ1} * \\ \text{NGHTADJ2} * \text{NGHTADJ3} * \text{NGHTADJ4} * \text{NGHTADJ5} * \\ \text{NGHTADJ6} * \text{NGTOTADJ1} * \text{NGWHSHADJ} * \text{ELMHADJ}.$$

The terms in **ELMAINHT** can be described as follows. **ELMHEAT** was an indicator variable that equaled one if electricity was the main space-heating fuel. **ELMHADJ** was a term that adjusted for the type of electric space-heating equipment and the type of housing unit. The rest of the terms were adapted from the natural gas regression results.

**ELMHADJ** was given by:

$$\text{ELMHADJ} = 1 - (0.1713 * \text{HEATPUMP}) \\ - (0.2170 * \text{PORTELEC}), \\ - (0.3890 * \text{LRGAPTBD}).$$

## Water-Heating Component

The term **ELWATERHT** represented the use of electricity for water heating. **ELWATERHT** was given by:

$$\text{ELWATERHT} = 0.3890 * \text{NGWHSIZE} * \text{NGWHSHADJ} * \text{NGTOTADJ1} * \\ \text{ELWATADJ1} * \text{ELWATADJ2}.$$

The first three terms in **ELWATERHT** were adapted from the natural gas results. The first term (**NGWHSIZE**) expressed the consumption of energy for water heating as a function of the square root of the number of household members and the square root of the number of teenage household members. The second term (**NGWHSHADJ**) adjusted **ELWATERHT** for the type of housing unit. The third term (**NGTOTADJ1**) adjusted **ELWATERHT** for demographic variables. The fourth term (**ELWATADJ1**) adjusted **ELWATERHT** for the situation in which electricity was only a secondary water-heating fuel or the household did not have hot running water. The last term (**ELWATADJ2**) adjusted **ELWATERHT** for the climate. **ELWATADJ1** and **ELWATADJ2** were given by:

$$\text{ELWATADJ1} = \text{ELWHEAT} * \text{HVTRUNW} \\ + 0.1152 * (\text{ELSWHEAT} + (\text{ELWHEAT} * (1 - \text{HVTRUNW})))$$

and

$$\text{ELWATADJ2} = 1 - (0.09455 * (\text{CDD75}/1000)).$$

Note: The term **ELWATADJ2** was originally intended to equal the term **NGWATADJ2** used in the natural gas water-heating component. Inadvertently, cooling degree-days base 75 degrees (**CDD75**) was used in **ELWATADJ2**.

instead of cooling degree-days base 65 degrees (CDD65), as was used in NGWATADJ2. As a result, the value of ELWATADJ2 was larger than or equal to the value of NGWATADJ2 for the same location.

## Air-Conditioning Component

The term ELAIRCON represented the use of electricity for air conditioning. ELAIRCON was given by:

$$\begin{aligned} \text{ELAIRCON} = & (1 - \text{USEACNOT}) * \text{ELACCDD} * \text{ELACSIZE} * \\ & \text{ELACADJ1} * \text{ELACADJ2} * \text{ELACADJ3} * \\ & \text{ELACADJ4} * \text{ELACADJ5}. \end{aligned}$$

The terms in the electricity air-conditioning component were defined as follows. The term (1 - USEACNOT) equaled zero when the household reported that they did not use their air-conditioning equipment. In this case, the air-conditioning component was zero. The term (1-USEACNOT) equaled one when the household reported that they used their air-conditioning equipment. The term ELACCDD was a function of cooling degree-days. The term ELACSIZE was a function of the amount of floorspace that could be cooled, the number of rooms that could be cooled, and the number of household members. The terms ELACADJ1, ELACADJ2, ELACADJ3, ELACADJ4, and ELACADJ5 were terms that adjusted the air-conditioning component for the type of equipment, the age of the housing unit, the pattern of use of the equipment, the presence of a evaporative cooler (swamp cooler), and the presence of a heat pump.

ELACCDD, ELACSIZE, ELACADJ1, ELACADJ2, ELACADJ3, ELACADJ4, and ELACADJ5 were given by:

$$\begin{aligned} \text{ELACCDD} &= (10.00 * \text{SQRTCD65}), \\ \text{ELACSIZE} &= (0.1099 * \text{SQRTCOOL}) + (1.649 * \text{SQRTACRS} * \text{SQRTNHMM}), \\ \text{ELACADJ1} &= 1 + (0.3881 * \text{HVCENTAC}), \\ \text{ELACADJ2} &= 1 - (0.2037 * \text{MD80PLUS}), \\ \text{ELACADJ3} &= 1 + (0.5365 * \text{USEACQBT}) + (1.345 * \text{USEACASL}), \\ \text{ELACADJ4} &= 1 - (0.5917 * \text{HVSWMPCL}), \end{aligned}$$

and

$$\text{ELACADJ5} = 1 - (0.1713 * \text{HEATPUMP}).$$

## Appliance Component

The term ELAPPLTOT represented the use of electricity for all end uses except space heating, water heating, and air conditioning. ELAPPLTOT it given by:

$$\begin{aligned} \text{ELAPPLTOT} = & ((\text{ELGENAPL} + \text{FRIGFRZZ}) * \text{ELAPPLADJ1} * \text{ELAPPLADJ2}) \\ & + \text{ELCFAFAN}. \end{aligned}$$

The subcomponent ELGENAPL in the electricity appliance component represented the amount of electricity consumed in all appliances except refrigerators, freezers, and appliances used for space heating, water heating, and air conditioning. In particular, lighting and many small appliances (such as room fans, toasters, and VCR's) were covered

by the terms in ELGENAPL involving the size of the dwelling and the number of household members. The use of electricity to operate refrigerators and freezers was represented by the terms in the subcomponent FRIGFRZZ. The use of electricity to run fans for central forced-air space-heating systems was represented by the subcomponent ELCFAFAN.

The terms ELAPPLADJ1 and ELAPPLADJ2 adjusted ELGENAPL and FRIGFRZZ for the age of the head of the household and the type of housing unit. ELAPPLADJ1 and ELAPPLADJ2 were given by:

$$\text{ELAPPLADJ1} = 1 + (0.12700 * \text{MIDDLEHH})$$

and

$$\begin{aligned}\text{ELAPPLADJ2} = 1 - & (0.10276 * \text{LRGAPTBD}) \\ & - (0.06514 * (\text{SFATTACH} + \text{SMLAPTBD}))\end{aligned}$$

ELGENAPL was given by:

$$\begin{aligned}\text{ELGENAPL} = & (895.9 * \text{NUMTVCLR}) \\ & + (3,894 * \text{HVPOOL}) \\ & + (6,046 * \text{HVHTPOOL}) \\ & + (3,000 * \text{ELPLHEAT}) \\ & + (4,046 * \text{HVWATBED}) \\ & + (1,496 * \text{WATPUMP}) \\ & + (1,256 * \text{ELCOOK} * \text{SQRTNHMM}) \\ & + (993.6 * \text{CLSWASHR} * \text{SQRTNHMM}) \\ & + (1,408 * \text{ELCLSDRY} * \text{SQRTNHMM}) \\ & + (1,105 * \text{DSHWASHR} * \text{SQRTNHMM}) \\ & + (999.1 * \text{NUMHSMEM}) \\ & + (599.7 * \text{NUMROOMS}) \\ & + (179.2 * \text{NUMBATHR} * \text{NUMBATHR}).\end{aligned}$$

FRIGFRZZ was given by:

$$\text{FRIGFRZZ} = \text{FRIGINDX} * \text{FRIGADJ}.$$

The term FRIGADJ adjusted FRIGINDX for the weather. The refrigerators and freezers located in dwellings in warmer areas were projected to consume more electricity than refrigerators and freezers in dwellings in colder areas.

FRIGINDX and FRIGADJ were given by:

$$\begin{aligned}
 \text{FRIGINDEX} = & (2,081 * \text{NUMFFRFG}) \\
 & + (2,660 * \text{HVNOFRFZ}) \\
 & + (820.1 * \text{NUMMURFG}) \\
 & + (2,034 * \text{HVMANUFZ})
 \end{aligned}$$

$$\text{FRIGADJ} = 1 + (0.03643 * \text{SQRTCD75}).$$

**ELCFAFAN** was given by:

$$\text{ELCFAFAN} = 2.928 * (\text{CFAEQUIP} + \text{HEATPUMP}) * \text{NGHTHDD}.$$

## Fuel Oil Regression Equations

Two sets of equations were used for fuel oil. The first set was developed using the respondents' estimates for the amount of fuel oil consumed by the households for a 12-month period and the estimates of the number of fuel oil deliveries for a 12-month period. The second set was developed without these estimates. Most of the respondents that paid for fuel oil directly gave estimates for these two quantities. If the housing unit was rented and the rent covered the fuel oil bills, then the respondents were not asked to estimate these quantities. The respondents' estimates were used to determine the value of three indicator variables. These variables were used in the first set of equations. **HIGHEST** was an indicator variable that equaled one if the respondent's estimate of the annual fuel oil usage was 1,000 or more gallons. **LOWNDELV** was an indicator variable that equaled one if the respondent's estimate of the number of fuel oil deliveries was zero or one. **HGHNDELV** was an indicator variable that equaled one if the respondent's estimate of the number of fuel oil deliveries was 10 or more.

For both fuel oil equations, the general form of the regression equations was as follows:

$$\text{SPHTCOM} = (\text{FOMAINHT} + \text{FOSECHEAT}) * \text{FOSWHADJ},$$

$$\text{WTHTCOM} = \text{FOWATERHT} * \text{FOSWHADJ},$$

and

$$\text{APPLCOM} = (23,000 * \text{FOPLHT}) + (135 * \text{FOOTHER}).$$

The use of fuel oil in air-conditioning equipment was extremely rare or nonexistent. No household sampled for the 1987 RECS used fuel oil to operate air-conditioning equipment. Therefore, no provision was made for a fuel oil air-conditioning component.

## Adjustment Factors

The term **FOSWHADJ** adjusted the space-heating and water-heating components. If the respondent estimates were available, then **FOSWHADJ** adjusted the two components for the value of the estimates and for the type of the space-heating equipment. If the respondents' estimates were not available, then **FOSWHADJ** adjusted the two components only for the type of space-heating equipment.

When the variables **HIGHEST**, **LOWNDELV**, and **HGHNDELV** were available, then **FOSWHADJ** was given by:

$$\begin{aligned} \text{FOSWHADJ} = & 1 + (0.1297 * \text{HIGHEST}) \\ & - (0.2574 * \text{LOWNDELV}) \\ & + (0.2575 * \text{HIGHNDELV}) \\ & + (0.1771 * \text{FOMHEAT} * \text{RADEQUIP}). \end{aligned}$$

When the variables HIGHEST, LOWNDELV, and HIGHNDELV were not available, then FOSWHADJ was given by:

$$\text{FOSWHADJ} = 1 + (0.2311 * \text{FOMHEAT} * \text{RADEQUIP}).$$

## Space-Heating Component

FOMAINHT and FOSECHEAT were subcomponents of the space-heating component for fuel oil. FOMAINHT represented the consumption of fuel oil for space heating when fuel oil was the main space-heating fuel. FOSECHEAT represented the consumption of fuel oil for space heating when fuel oil was a secondary space-heating fuel and was not used as the main space-heating fuel. Both FOMAINHT and FOSECHEAT used terms that were developed using the natural gas data. The natural gas terms were used in the fuel oil space-heating component for the same reasons that natural gas terms were used in the electricity space-heating component. (See this appendix, Electricity Regression Equations, Space-Heating Component for details.)

When the variables HIGHEST, LOWNDELV, and HIGHNDELV were available, then FOMAINHT and FOSECHEAT were given by:

$$\begin{aligned} \text{FOMAINHT} = & 65.13 * \text{FOMHEAT} * \text{LOGHDD60} * \text{NGHTSZ} * \text{NGHTADJ1} * \\ & \text{NGHTADJ2} * \text{NGHTADJ3} * \text{NGHTADJ4} * \text{NGHTADJ5} * \\ & \text{NGHTADJ6} * \text{NGTOTADJ1} * \text{NGWHSHADJ} \end{aligned}$$

and

$$\text{FOSECHEAT} = 142.4 * \text{FOSHEAT} * \text{NGHTSZ}.$$

When the variables HIGHEST, LOWNDELV, and HIGHNDELV were not available, then FOMAINHT and FOSECHEAT were given by:

$$\begin{aligned} \text{FOMAINHT} = & 65.67 * \text{FOMHEAT} * \text{LOGHDD60} * \text{NGHTSZ} * \text{NGHTADJ1} * \\ & \text{NGHTADJ2} * \text{NGHTADJ3} * \text{NGHTADJ4} * \text{NGHTADJ5} * \\ & \text{NGHTADJ6} * \text{NGTOTADJ1} * \text{NGWHSHADJ} \end{aligned}$$

and

$$\text{FOSECHEAT} = 129.7 * \text{FOSHEAT} * \text{NGHTSZ}.$$

## Water-Heating Component

When the variables HIGHEST, LOWNDELV, and HGHNDELV were available, then FOWATERHT was given by:

$$\text{FOWATERHT} = 1.147 * \text{NGWHSIZE} * \text{NGWATADJ2} * \text{NGWHSHADJ} * \\ \text{NGTOTADJ1} * \text{FOWATADJ}.$$

When the variables HIGHEST, LOWNDELV, and HGHNDELV were not available, then FOWATERHT was given by:

$$\text{FOWATERHT} = 1.229 * \text{NGWHSIZE} * \text{NGWATADJ2} * \text{NGWHSHADJ} * \\ \text{NGTOTADJ1} * \text{FOWATADJ}.$$

In both equations, the first four terms in FOWATERHT were adapted from the natural gas results. The first term (NGWHSIZE) expressed the consumption of energy for water heating as a function of the square root of the number of household members and the square root of the number of teenage household members. The second term (NGWATADJ2) adjusted FOWATERHT for climate. The third term (NGWHSHADJ) adjusted FOWATERHT for the type of housing unit. The fourth term (NGTOTADJ1) adjusted FOWATERHT for demographic variables.

FOWATADJ was an adjustment for the situation in which fuel oil was only a secondary water-heating fuel or the household did not have hot running water. The term FOWATADJ resembled the term NGWATADJ1 used in the natural gas water-heating component. FOWATADJ was as follows:

$$\text{FOWATADJ} = (\text{FOWTHT} * \text{HVTRUNW}) \\ + 0.6231 * (\text{FOSWTHT} + (\text{FOWTHT} * (1 - \text{HVTRUNW}))).$$

Very few households sampled for the 1987 RECS used fuel oil as a secondary water-heating fuel. As a result, the estimate for the coefficient in FOWATADJ would have had a large variance. It was decided to arbitrarily set the coefficient equal to 0.6231 (a value obtained from the natural gas results); the coefficient was not estimated by using the fuel oil data.

## Appliance Component

Only 9 households sampled for the 1987 RECS used fuel oil for some end use other than space heating or water heating. In 7 of the 9 observations, fuel oil was used to heat a swimming pool. Because of the small number of observations, the coefficients in the equation for the fuel oil appliances component were not estimated using the fuel oil data. Instead the coefficient for FOPLHT was obtained from the natural gas results. The coefficient for FOOTHER represented the use of one gallon per year.

## LPG Regression Equations

The regression equations for LPG were as follows:

**SPHTCOM = LPGMAINHT + LPGSECHT,**

**WTHTCOM = LPGWATHT,**

and

**APPLCOM = LPGAPPL.**

The use of LPG in air-conditioning equipment was rare. Only 2 households sampled for the 1987 RECS had LPG air-conditioning equipment. Both of these households reported that they did not use their air-conditioning equipment. Therefore, no provision was made for a LPG air-conditioning component. On a national scale, the small amount of LPG that was used in air-conditioning equipment can be considered to be part of the LPG appliance component.

## Space-Heating Component

LPGMAINHT represented the consumption of LPG for space heating when LPG was the main space-heating fuel. LPGSECHT represented the consumption of LPG for space heating when LPG was a secondary space-heating fuel but not the main space-heating fuel. The results of the natural gas regression were used to calculate the independent variable used in LPGMAINHT. LPGMAINHT and LPGSECHT were given by:

$$\begin{aligned} \text{LPGMAINHT} = & 0.8221 * \text{LPGMHEAT} * \text{NGHTHDD} * \text{NGHTSZ} * \text{NGHTADJ1} * \\ & \text{NGHTADJ2} * \text{NGHTADJ3} * \text{NGHTADJ4} * \text{NGHTADJ5} * \\ & \text{NGHTADJ6} * \text{NGTOTADJ1} * \text{NGWHSHADJ} \end{aligned}$$

and

$$\text{LPGSECHT} = 281.8 * \text{LPGSHEAT} * \text{SQRTHD60}.$$

In the equation for LPGMAINHT, the term LPGMHEAT was an indicator variable that equaled one if LPG was the main space-heating fuel. In the equation for LPGSECHT, the term LPGSHEAT was an indicator variable that equaled one if LPG was a secondary, but not the main space-heating fuel.

## Water-Heating Component

The terms in the LPG water-heating component were given by:

$$\begin{aligned} \text{LPGWATHT} = & 0.7446 * \text{NGWHSIZE} * \text{NGWATADJ2} * \text{NGWHSHADJ} * \\ & \text{NGTOTADJ1} * \text{LPGWATADJ}. \end{aligned}$$

Where

$$\begin{aligned} \text{LPGWATADJ} = & (\text{LPGWTHT} * \text{HVHTRUNW}) \\ & + 0.6231 (\text{LPGSWTHT} + \text{LPGWTHT} * (1 - \text{HVHTRUNW})). \end{aligned}$$

LPGWATADJ was an adjustment for the situation in which LPG was only a secondary water-heating fuel or the household did not have hot running water. The term LPGWATADJ resembled the term NGWATADJ1 used in the natural gas water-heating component.

Very few households sampled for the 1987 RECS used LPG as a secondary water-heating fuel. As a result, any estimate for the coefficient for the variable LPGSWTHT would have had a large variance. It was decided to arbitrarily set the coefficient equal to 0.6231 (a value obtained from the natural gas results); the coefficient was not estimated by using the LPG data.

## Appliance Component

The appliance component for LPG contained terms that accounted for the use of LPG for cooking, clothes drying, outdoor lights, and pool heating.

LPGAPPL was given by:

$$\begin{aligned} \text{LPGAPPL} = & (3190 * \text{SQRTNHMM} * (\text{LPGCOOK} + \text{LPGSCOOK})) \\ & + (606.8 * \text{LPGDRYER} * \text{SQRTNHMM}) \\ & + (844.3 * \text{LPGLIGHT} * \text{NUMROOMS}) \\ & + (20,037 * \text{LGPLH}). \end{aligned}$$

## Kerosene Regression Equations

The regression equations for kerosene were as follow:

$$\begin{aligned} \text{SPHTCOM} &= \text{KERSECHEAT} + \text{KERMHTPORT} + \text{KERMHTFIX}, \\ \text{WTHTCOM} &= \text{KERWATERHT}, \end{aligned}$$

and

$$\text{APPLCOM} = 540 * \text{KEROOTHER}.$$

The use of kerosene in air-conditioning equipment was extremely rare or nonexistent. No household sampled for the 1987 RECS used kerosene to operate air-conditioning equipment. Therefore, no provision was made for a kerosene air-conditioning component.

## Space-Heating Component

KERSECHEAT, KERMHTPORT, and KERMHTFIX were subcomponents of the space-heating component for kerosene. KERSECHEAT represented the consumption of kerosene for space heating when kerosene was a secondary

space-heating fuel but not the main space-heating fuel. KERMHTPORT represented the consumption of kerosene for space heating when kerosene was the main space-heating fuel and kerosene was used in portable kerosene heaters. KERMHTFLX represented the consumption of kerosene for space heating when kerosene was the main space-heating fuel and the main space-heating equipment was not a portable kerosene heater.

Two equations were used for the term KERSECHEAT. The first equation was developed using the respondent's estimate of the number of kerosene deliveries or purchases. The second equation did not use the estimates. When the estimates were available, the variable SQRTNMDL, was calculated. SQRTNMDL was the square root of the estimated number of kerosene deliveries or purchases.

When SQRTNMDL was available, KERSECHEAT was given by:

$$\begin{aligned} \text{KERSECHEAT} = & 22.41 * \text{KERSHEAT} * \text{NGHTHDD} * \text{KERSHTADJ1} * \\ & \text{KERSHTADJ2} * \text{KERSHTADJ3}. \end{aligned}$$

KERSHEAT was an indicator variable that equaled one if kerosene was a secondary but not the main space-heating fuel.

NGHTHDD was determined using the natural gas data. KERSHTADJ1, KERSHTADJ2, and KERSHTADJ3 were terms that adjusted KERSECHEAT. KERSHTADJ1 adjusted KERSECHEAT according to the main space-heating fuel, KERSHTADJ2 adjusted KERSECHEAT according to the amount of secondary heating that was used, and KERSHTADJ3 adjusted KERSECHEAT according to the way that kerosene was purchased and the square root of the estimated number of kerosene deliveries or purchases. KERSHTADJ1, KERSHTADJ2, and KERSHTADJ3 were given by:

$$\text{KERSHTADJ1} = 1 - (0.1613 * \text{NGMHEAT}),$$

$$\text{KERSHTADJ2} = 1 + (0.3911 * (\text{MHTC6795} + \text{MHTC66MN})),$$

and

$$\begin{aligned} \text{KERSHTADJ3} = & 1 + (0.4930 * (\text{SQRTNMDL} - 2.794)) \\ & + (2.662 * (1 - \text{CHCYKERO})). \end{aligned}$$

When SQRTNMDL was not available, KERSECHEAT was given by:

$$\begin{aligned} \text{KERSECHEAT} = & 16.38 * \text{KERSHEAT} * \text{NGHTHDD} * \text{KERSHTADJ1} * \\ & \text{KERSHTADJ2}. \end{aligned}$$

KERSHTADJ1 and KERSHTADJ2 were given by:

$$\text{KERSHTADJ1} = 1 - (0.3308 * \text{NGMHEAT}),$$

and

$$\text{KERSHTADJ2} = 1 + (1.348 * (\text{MHTC6795} + \text{MHTC66MN})).$$

KERMHTPORT was given by:

$$\begin{aligned} \text{KERMHTPORT} = & 0.5588 * \text{KERPORTHHT} * \text{NGHTHDD} * \text{NGHTSZ} * \text{NGHTADJ1} * \\ & \text{NGHTADJ2} * \text{NGHTADJ3} * \text{NGHTADJ4} * \text{NGHTADJ5} * \\ & \text{NGHTADJ6} * \text{NGTOTADJ1} * \text{NGWHSHADJ} * \text{KRPTHTADJ}. \end{aligned}$$

KERPORTHT was an indicator variable that equaled one if the main space-heating equipment was a portable kerosene heater. KRPTHTADJ was a term that adjusted KERMHTPORT for the use of portable electricity space heaters as a secondary source of space heat. The rest of the terms were adapted from the natural gas equation.

KRPTHTADJ was given by:

$$\text{KRPTHTADJ} = 1 - (0.4180 * \text{SECELPRT}).$$

KERMHTFIX was given by:

$$\begin{aligned} \text{KERMHTFIX} = & 0.7865 * \text{KERFIXMHT} * \text{NGHTHDD} * \text{NGHTSZ} * \text{NGHTADJ1} * \\ & \text{NGHTADJ2} * \text{NGHTADJ3} * \text{NGHTADJ4} * \text{NGHTADJ5} * \\ & \text{NGHTADJ6} * \text{NGTOTADJ1} * \text{NGWHSHADJ} * \text{KRFXHTADJ}. \end{aligned}$$

KERFIXMHT was an indicator variable that equaled one if the main space-heating equipment was not a portable kerosene heater. KRFXHTADJ was a variable that adjusted KERMHTFIX for the way that kerosene was purchased. The rest of the terms were adapted from the natural gas equation.

KRFXHTADJ was given by:

$$\text{KRFXHTADJ} = 1 - (0.4435 * \text{CHCYKERO}).$$

## Water-Heating Component

Only four households that responded to the 1987 RECS, indicated that kerosene was used to heat water. Three of these households indicated that kerosene was the main water-heating fuel, the remaining household indicated that kerosene was a secondary water-heating fuel. The kerosene water-heating component for the household that indicated that kerosene was a secondary water-heating fuel was set equal to zero. The value of KERWATERHT for the other three households was given by:

$$\begin{aligned} \text{KERWATERHT} = & (0.7865 * \text{KERWTHT} * \text{KERFIXMHT} * \text{KRFXHTADJ} * \\ & \text{NGWHSIZE} * \text{NGWATADJ2} * \\ & \text{NGTOTADJ1} * \text{NGWHSHADJ}) \\ & + (0.5588 * \text{KERWTHT} * \text{KERPORTHHT} * \text{KRPTHTADJ} * \\ & \text{NGWHSIZE} * \text{NGWATADJ2} * \\ & \text{NGTOTADJ1} * \text{NGWHSHADJ}). \end{aligned}$$

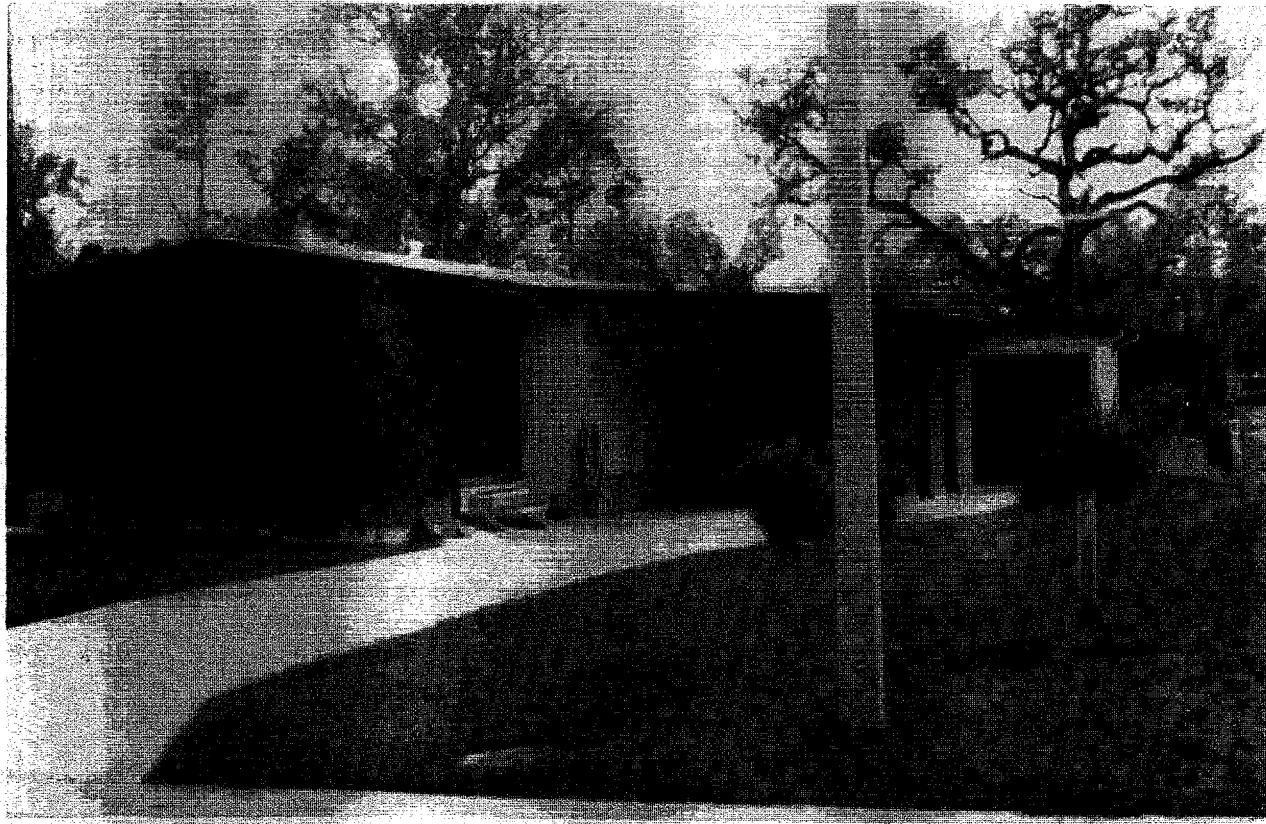
The value of the coefficients in KERWATERHT were constrained to match those in the kerosene space-heating component. KERWTHT was an indicator variable that equaled one if the main water-heating fuel was kerosene.

**KERFIXMHT, KRXHTADJ, KERPORTHT, and KRPTHTADJ** were the same as the variables in the kerosene space-heating component. The rest of the variables in **KERWATERHT** were adapted from the natural gas water-heating component.

## Appliance Component

The term **KEROOTHER** in the appliance component is an indicator variable that equaled one if kerosene was used for some end use other than space heating or water heating.

Only 6 households sampled for the 1987 RECS used kerosene for some other end use other than space heating and water heating. These were the only cases where the appliances component for kerosene would be nonzero. The equation for the kerosene appliances component was not developed using least squares regression technique. The coefficient for the term **KEROOTHER** (which equaled 540) was equal to the geometric mean of the kerosene consumption for households that did use kerosene but did not use kerosene for space heating or water heating. The coefficient (540) represents 4 gallons of kerosene.



*This single-family detached housing unit is an example of some of the housing structures included in the RECS.*

## Definition of End-Use Variables

Many of the independent variables used in the regression equations were **indicator variables**. By definition, an indicator variable is set equal to one when a certain condition is met. Otherwise, the variable is set equal to zero.

The definition of the variables used in the end-use regression equations follows.

**ACINDEX:** Index used in natural gas air-conditioning component. The index was given by

$$\begin{aligned} \text{ACINDEX} = & 1 - (1.0 * \text{USEACNOT}) \\ & + (0.5 * \text{USEACQBT}) \\ & + (1.3 * \text{USEACASL}). \end{aligned}$$

**AIRCCOM:** Energy used for air-conditioning component.

**ALASKA:** An indicator variable that equaled one if the housing unit was located in Alaska.

**APPLCOM:** Energy used for appliance component.

**APTUNIT:** An indicator variable that equaled one if the housing unit was in a building that contained two or more housing units.

**BASEHEAT:** Variable describing the amount of heated floorspace in the basement. **BASEHEAT** was set equal to zero if the housing unit was located in an apartment building or if the housing unit was a single-family (attached, detached, or mobile home) housing unit that did not have a basement or had an unheated basement. **BASEHEAT** was set equal to one if the housing unit was a single-family housing unit with a completely heated basement. **BASEHEAT** was set equal to 0.5 if the housing unit was a single-family housing unit with a partially heated basement.

**BLACK:** An indicator variable that equaled one if the respondent indicated that the householder's primary ethnic background was black.

**CDD65:** Number of cooling degree-days (base 65 degrees Fahrenheit).

**CDD75:** Number of cooling degree-days (base 75 degrees Fahrenheit).

**CFAEQUIP:** An indicator variable that equaled one if the main space-heating equipment was a central forced-air system. Note: Heat pumps were not counted as a central forced-air system.

**CHCYKERO:** An indicator variable that equaled one if the household purchased kerosene on a cash-and-carry basis.

**CLSWASHR:** An indicator variable that equaled one if the household had an automatic clothes washer.

**COOKSTVH:** An indicator variable that equaled one if the main space-heating equipment was a cooking stove.

**DSHWASHR:** An indicator variable that equaled one if the household had an electric dishwasher.

**ELACADJ1:** A term that adjusted the electricity air-conditioning component for the presence of central air-conditioning equipment.

**ELACADJ2:** A term that adjusted the electricity air-conditioning component for the presence of a household member age 80 years or older.

**ELACADJ3:** A term that adjusted the electricity air-conditioning component for the reported amount of time the air-conditioning equipment was used.

**ELACADJ4:** A term that adjusted the electricity air-conditioning component for the presence of an evaporative (swamp) cooler.

**ELACADJS:** A term that adjusted the electricity air-conditioning component for the presence of a heat pump.

**ELACCDD:** A term within the electricity air-conditioning component that was a function of cooling degree-days.

**ELACSIZE:** A term within the electricity air-conditioning component that was a function of the amount of floor-space that can be cooled, the number of rooms that can be cooled, and the number of household members.

**ELAIRCON:** A midlevel term within the electricity air-conditioning component.

**ELAPACADJ:** A term that adjusted the electricity appliance component and the air-conditioning component for demographic characteristics.

**ELAPPLADJ1:** A term that adjusted the electricity appliance component for the age of the head of the household.

**ELAPPLADJ2:** A term that adjusted the electricity appliance component for the type of the housing unit.

**ELAPLTOT:** A midlevel term within the electricity appliance component.

**ELCAFAN:** A term within the electricity appliance component that represented the electricity used to operate the fans in a central forced-air main space-heating system.

**ELCLSDRY:** An indicator variable that equaled one if the household had an electric clothes dryer.

**ELCOOK:** An indicator variable that equaled one if electricity was the main fuel used for cooking.

**ELGENAPL:** A term within the electricity appliance component that represented the amount of electricity consumed in all appliances except refrigerators, freezers, and appliances used for space heating, water heating, and air conditioning.

**ELMAINHT:** A term in the electricity space-heating component that accounted for the use of electricity as the main space-heating fuel.

**ELMHADJ:** A term that adjusted the electricity space-heating component for the type of equipment.

**ELMHEAT:** An indicator variable that equaled one if electricity was the main space-heating fuel.

**ELPLHEAT:** An indicator variable that equaled one if the household had an electrically heated swimming pool.

**ELSECHEAT:** A term in the electricity space-heating component that accounted for the use of electricity as a secondary space-heating fuel.

**ELSHEAT:** An indicator variable that equaled one if electricity was a secondary space-heating fuel and was not the main space-heating fuel.

**ELSWHEAT:** An indicator variable that equaled one if electricity was a secondary water-heating fuel and was not the main water-heating fuel.

**ELTOTADJ:** A term that adjusted all electricity components for the price of electricity.

**ELWATADJ1:** A term that adjusted the electricity water-heating component when electricity was only a secondary water-heating fuel or the housing unit did not have hot running water.

**ELWATADJ2:** A term that adjusted the electricity water-heating component for the climate.

**ELWATERHT:** A midlevel term within the electricity water-heating component.

**ELWHEAT:** An indicator variable that equaled one if electricity was the main water-heating fuel.

**FEMLHEAD:** An indicator variable that equaled one if the head of the household was a female.

**FOMAINHT:** A term in the fuel oil space-heating component that accounted for the use of fuel oil as the main space-heating fuel.

**FOMHEAT:** An indicator variable that equaled one if fuel oil was the main space-heating fuel.

**FOOTHER:** An indicator variable that equaled one if fuel oil was used for an end use other than space heating or water heating.

**FOPLHT:** An indicator variable that equaled one if the household had a fuel oil-heated swimming pool.

**FOSECHEAT:** A term within the fuel oil space-heating component that accounted for the use of fuel oil as a secondary space-heating fuel.

**FOSHEAT:** An indicator variable that equaled one if fuel oil was a secondary space-heating fuel and was not the main space-heating fuel.

**FOSWHADJ:** A term that adjusted the fuel oil space-heating and water-heating components for the type of equipment.

**FOSWTHT:** An indicator variable that equaled one if fuel oil was a secondary water-heating fuel and was not the main water-heating fuel.

**FOWATADJ:** A term that adjusted the fuel oil water-heating component when fuel oil was only a secondary water-heating fuel or the housing unit did not have hot running water.

**FOWATERHT:** A midlevel term within the fuel oil water-heating component.

**FOWTHT:** An indicator variable that equaled one if fuel oil was the main water-heating fuel.

**FRIGADJ:** A term that adjusted the refrigerator and freezer terms for cooling degree-days.

**FRIGFRZZ:** A term within the electricity appliance component that accounted for the use of electricity in refrigerators and freezers.

**FRIGINDX:** A term within the electricity appliance component that accounts for the number and type of refrigerators and the presence and type of freezers.

**FULWAINS:** A indicator variable that equaled one if the housing unit was a single-family housing unit (detached, attached, or mobile home), and the respondent reported that the housing unit had full attic and wall insulation.

**GOODINCM:** An indicator variable that equaled one if the household had an annual income greater than \$35,000.

**HDD60:** Number of heating degree-days (base 60 degrees Fahrenheit).

**HEATED:** Amount of heated floorspace (in square feet) in a housing unit.

**HEATPUMP:** An indicator variable that equaled one if the main space-heating equipment was a heat pump.

**HGHINDELV:** An indicator variable that equaled one if the respondent's estimate of the annual number of fuel oil deliveries was 10 or more.

**HH50PLUS:** An indicator variable that equaled one if the head of the household was age 50 years or older.

**HIGHEST:** An indicator variable that equaled one if the respondent's estimate of the annual fuel oil usage was 1,000 or more gallons.

**HIGHINCM:** An indicator variable that equaled one if the household had an annual income greater than \$75,000.

**HVAD80PL:** An indicator variable that equaled one if the household had a member age 80 years or older.

**HVCENTAC:** An indicator variable that equaled one if the household had a central air-conditioning system.

**HVHTPOOL:** An indicator variable that equaled one if the household had a heated swimming pool.

**HVHTRUNW:** An indicator variable that equaled one if the housing unit had hot running water.

**HVMANUFZ:** An indicator variable that equaled one if the household had a manual-defrost electric freezer.

**HVNDFRFZ:** An indicator variable that equaled one if the household had a frost-free or automatic-defrost electric freezer.

**HVPOOL:** An indicator variable that equaled one if the household had a swimming pool.

**HVSWMPC1:** An indicator variable that equaled one if the household had an evaporative (swamp) cooler.

**HWWATBED:** An indicator variable that equaled one if the household had one or more heated water beds.

**KERFIXMHT:** An indicator variable that equaled one if the main space-heating equipment was not a portable kerosene heater.

**KERMHTFIX:** A term within the kerosene space-heating component that represented the amount of kerosene consumed for space heating when kerosene was the main space-heating fuel, and the main space-heating equipment was not a portable kerosene heater.

**KERMHTPORT:** A term within the kerosene space-heating component that represented the amount of kerosene consumed for space heating when kerosene was the main space-heating fuel and the main space-heating equipment was a portable kerosene heater.

**KEROTHER:** An indicator variable that equaled one if kerosene was used for an end use other than space heating or water heating.

**KERPORTHT:** An indicator variable that equaled one if the main space-heating equipment was a portable kerosene heater.

**KERSECHEAT:** A term within the kerosene space-heating component that represented the amount of kerosene consumed for space heating when kerosene was used as a secondary space-heating fuel.

**KERSHEAT:** An indicator variable that equaled one if kerosene was a secondary space-heating fuel and was not the main space-heating fuel.

**KERSHTADJ1:** A term that adjusted the kerosene space-heating component downward when natural gas was used as the main space-heating fuel and kerosene was used as a secondary space-heating fuel.

**KERSHTADJ2:** A term that adjusted the kerosene space-heating component upward when kerosene was used as a secondary space-heating fuel, and the main space-heating fuel was reported by the respondent to provide "about three-fourths" or "closer to half" of the heat.

**KERSHTADJ3:** A term that adjusted the kerosene space-heating component according to the way that kerosene was purchased and the estimated number of kerosene deliveries or purchases. The term was only used when kerosene was a secondary space-heating fuel.

**KERWATERHT:** A midlevel term in the kerosene water-heating component.

**KERWTHT:** An indicator variable that equaled one if kerosene was the main water-heating fuel.

**KRFXHTADJ:** A term that adjusted the kerosene space-heating and water-heating components when kerosene was used as the main space heating fuel and the main space-heating equipment was not a portable kerosene heater.

**KRPHTHTADJ:** A term that adjusted the kerosene space-heating and water-heating components when kerosene was used as the main space-heating fuel, the main space-heating equipment was a portable kerosene heater, and a portable electric space heater was used as a secondary source of space heat.

**LOGHDD60:** Log(base 10) of HDD60.

**LOGHTSF:** Log(base 10) of heated floorspace.

**LOGRELPC:** Log(base 10) of ((price of 1,000 kWh of electricity) / (\$75.00)).

**LOWNDELV:** An indicator variable that equaled one if the respondent's estimate of the number of fuel oil deliveries was zero or one.

**LPGAPPL:** A midlevel term within the LPG appliance component.

**LPGCOOK:** An indicator variable that equaled one if LPG was the main cooking fuel.

**LPGDRYER:** An indicator variable that equaled one if the household had a LPG clothes dryer.

**LPGLIGHT:** An indicator variable that equaled one if the household had a LPG outdoor light.

**LPGMAINHT:** A term in the LPG space-heating component that accounted for the use of LPG as the main space-heating fuel.

**LPGMHEAT:** An indicator variable that equaled one if LPG was the main space-heating fuel.

**LPGPLHT:** An indicator variable that equaled one if the household had a swimming pool heated with LPG.

**LPGSCOOK:** An indicator variable that equaled one if LPG was a secondary cooking fuel and was not the main cooking fuel.

**LPGSECHT:** A term within the LPG space-heating component representing the use of LPG as a secondary space-heating fuel.

**LPGSHEAT:** An indicator variable that equaled one if LPG was a secondary space-heating fuel and was not the main space-heating fuel.

**LPGSWTHT:** An indicator variable that equaled one if LPG was a secondary water-heating fuel and was not the main water-heating fuel.

**LPGWATADJ:** A term that adjusted the LPG water-heating component when LPG was only a secondary water-heating fuel, or the housing unit did not have hot running water.

**LPGWATHT:** A midlevel term within the LPG water-heating component.

**LPGWTHT:** An indicator variable that equaled one if LPG was the main water-heating fuel.

**LRGAPTBD:** An indicator variable that equaled one if the housing unit was located in a five or more unit apartment building.

**MD4059HM:** An indicator variable that equaled one if the housing unit was built between 1940 and 1959.

**MD80PLUS:** An indicator variable that equaled one if the housing unit was built in 1980 or later.

**MHTC6795:** An indicator variable that equaled one if the respondent reported that the main space-heating equipment contributed between 67 and 95 percent of the heat.

**MHTC66MN:** An indicator variable that equaled one if the respondent reported that the main space-heating system contributed less than two-thirds of the heat.

**MIDDLEHH:** An indicator variable that equaled one if the head of the household was between 40 and 59 years old.

**NDRSAWS:** Number of doors and windows in the housing unit.

**NGAIRCON:** A midlevel term within the natural gas air-conditioning component.

**NGAPPL:** A midlevel term within the natural gas appliance component.

**NGCACRMS:** Number of rooms cooled by a natural gas fueled central air-conditioning system.

**NGCOOK:** An indicator variable that equaled one if natural gas was the main cooking fuel.

**NGDRYER:** An indicator variable that equaled one if the household had a natural gas clothes dryer.

**NGHTADJ1:** A term that adjusted the natural gas space-heating component for the insulation characteristics of the housing unit.

**NGHTADJ2:** A term that adjusted the natural gas space-heating component for the type of space-heating equipment.

**NGHTADJ3:** A term that adjusted the natural gas space-heating component for the amount of space heating provided by secondary space-heating fuels.

**NGHTADJ4:** A term that adjusted the natural gas space-heating component for the age of the housing unit.

**NGHTADJ5:** A term that adjusted the natural gas space-heating component for the thermostat setting.

**NGHTADJ6:** A term that adjusted the natural gas space-heating component for the presence of a household member age 80 years or older.

**NGTHDD:** A term used in the natural gas space-heating component that was a function of the number of heating degree-days.

**NGHTSZ:** A term used in the natural gas space-heating component that was a function of the size of the housing unit.

**NGLIGHT:** An indicator variable that equaled one if the household had natural gas outdoor lights.

**NGMAINHT:** A term within the natural gas space-heating component that accounted for the use of natural gas as the main space-heating fuel.

**NGMHEAT:** An indicator variable that equaled one if natural gas was the main space-heating fuel.

**NGPOOLHT:** An indicator variable that equaled one if the household had a swimming pool heated by natural gas.

**NGSCOOK:** An indicator variable that equaled one if natural gas was a secondary cooking fuel and not the main cooking fuel.

**NGSECHADJ1:** A term that adjusted the natural gas space-heating component downward when natural gas was not the main space-heating fuel, natural gas was a secondary space-heating fuel, and a natural gas cooking stove was a type of secondary space-heating equipment.

**NGSECHADJ2:** A term that adjusted the natural gas space-heating component upward when natural gas was not the main space-heating fuel, natural gas was a secondary space-heating fuel, and the main space-heating fuel was reported by the respondents to provide "about three-fourths" or "closer to half" of the heat.

**NGSECHDD:** A term within the secondary space-heating portion of the natural gas space-heating component that was a function of heating degree-days.

**NGSECHEAT:** A term within the natural gas space-heating component that accounted for the use of natural gas as a secondary space-heating fuel.

**NGSHEET:** An indicator variable that equaled one if natural gas was a secondary space-heating fuel and not the main space-heating fuel.

**NGSWTHT:** An indicator variable that equaled one if natural gas was a secondary water-heating fuel and not the main water-heating fuel.

**NGTOTADJ1:** A term that adjusted all natural gas components for demographic characteristics of the household.

**NGTOTADJ2:** A term that adjusted all natural gas components for geographic location.

**NGWATADJ1:** A term that adjusted the natural gas water-heating component when natural gas was only a secondary water-heating fuel, or the housing unit did not have hot running water.

**NGWATADJ2:** A term that adjusted the natural gas water-heating component for the climate.

**NGWATERHT:** A midlevel term used in the natural gas water-heating component.

**NGWHSHADJ:** A term used to adjust the natural gas space-heating and water-heating components for the type of housing unit, the age of the housing unit, and family income.

**NGWHSIZE:** A term within the natural gas water-heating component that was a function of the square root of the number of household members, and the square root of the number of teenage household members.

**NGWTHT:** An indicator variable that equaled one if natural gas was the main water-heating fuel.

**NUMBATHR:** Number of bathrooms in the housing unit.

**NUMFFRFG:** Number of frost-free or automatic-defrost electric refrigerators in the housing unit.

**NUMHSMEM:** Number of household members in the housing unit.

**NUMMURFG:** Number of manual-defrost refrigerators in the housing unit.

**NUMROOMS:** Number of rooms in the housing unit.

**NUMTVCLR:** Number of color television sets in the housing unit.

**OLDHOME:** An indicator variable that equaled one if the housing unit was built before 1940.

**PCTNOSTM:** The percentage of windows and doors that were not storm windows and doors.

**POORHSLD:** An indicator variable that equaled one if the household had an annual income of less than \$10,000 and the household did not own the housing unit in which they lived.

**PORTELEC:** An indicator variable that equaled one if the main space-heating equipment was a portable electric heater.

**RADEQUIP:** An indicator variable that equaled one if the main space-heating equipment used radiators, convectors, or hot water pipes to distribute the heat.

**SECELPRT:** An indicator variable that equaled one if a portable electric space heater was used as a secondary source of space heat.

**SECNGCKS:** An indicator variable that equaled one if a natural gas stove was used for secondary space heating.

**SFATTACH:** An indicator variable that equaled one if the housing unit was a single-family attached unit.

**SFATTWOS:** An indicator variable that equaled one if the housing unit was a single-family attached unit that was attached on two sides.

**SF1SCSLB:** An indicator variable that equaled one if the housing unit was a single-story, single-family housing unit (detached, attached, or mobile home) built on a concrete slab with no basement or crawl space.

**SMLAPTBD:** An indicator variable that equaled one if the housing unit was located in a 2 to 4 unit apartment building.

**SPHEATER:** An indicator variable that equaled one if the main space-heating equipment was a room or space heater.

**SPHTCOM:** Energy used for space-heating component.

**SQRTACRS:** Square root of the number of rooms that were air-conditioned.

SQRTCD65: Square root of the cooling degree-days base 65 degrees Fahrenheit (CDD65).

SQRTCD75: Square root of the cooling degree-days base 75 degrees Fahrenheit (CDD75).

SQRTCOOL: Square root of the cooled square footage.

SQRTHD60: Square root of the heating degree-days base 60 degrees Fahrenheit (HDD60).

SQRTNHMM: Square root of the number of household members.

SQRTNMDL: Square root of the respondent's estimate of the number of kerosene purchases made by the household.

SQRTTEEN: Square root of the number of teenagers (ages 13 to 19) in the household.

TEMPINDEX: Indexes summarizing thermostat settings. The indexes are:

NT70PL, An indicator variable that equaled one if the thermostat setting during night sleeping hours was 70° Fahrenheit or higher.

HM70PL, An indicator variable that equaled one if the thermostat setting during the day when someone was home was 70° Fahrenheit or higher.

GN70PL, An indicator variable that equaled one if the thermostat setting when no one was home was 70° Fahrenheit or higher.

NT58MN, An indicator variable that equaled one if the thermostat setting during night sleeping hours was 58° Fahrenheit or less.

HM58MN, An indicator variable that equaled one if the thermostat setting during the day when someone was home was 58° Fahrenheit or less.

GN58MN, An indicator variable that equaled one if the thermostat setting when no one was home was 58° Fahrenheit or less.

$$\begin{aligned} \text{TEMPINDEX} = & \text{ NT70PL} + \text{ HM70PL} + \text{ GN70PL} \\ & - \text{ NT58MN} - \text{ HM58MN} - \text{ GN58MN} \end{aligned}$$

USEACASL, USEACNOT, USEACQBT: Indicator variables that show the amount of air conditioning used. The respondents who stated they had air-conditioning equipment were asked, "Which of the statements on this exhibit best describes the way you used your air conditioner this summer?" The following indicator variables were set based on the respondent's response.

USEACASL equaled one if the respondent reported "Turned on just about all summer".

USEACNOT equaled one if the respondent reported "Did not use at all".

USEACQBT equaled one if the respondent reported "Turned on quite a bit".

WATPUMP: An indicator variable that equaled one if the household had an electric water-pump.

WESTNC: An indicator variable that equaled one if the housing unit was located in the West North Central Census division.

WHRZNONE: An indicator variable that equaled one if the housing unit was located in Weather Zone 1. Zone 1 was defined as areas where the average annual heating degree-days (base 65° F) were greater than 7,000.

WTHTCOM: Energy used for water-heating component.

YCOM: Predicted annual energy consumption in thousands of Btu.



## **Appendix C**

### **Quality of the Data**

$$RSE(X/Y) = \sqrt{RSE^2(X) + RSE^2(Y)}$$



## Appendix C

# Quality of the Data

The quality of data collection and processing affects the accuracy of estimates based on the survey. All the statistics published in this report are estimates of population values, such as the total amount of electricity consumed in housing units. These estimates are based on observations from a randomly chosen subset of the entire population of occupied housing units. As a result, the estimates always differ from the true population values.

Differences that would be expected to occur in all possible samples, or in the average of all estimates from all possible samples, are known as systematic errors, biases, or nonsampling errors. The magnitude of nonsampling errors cannot be estimated from the sample data. For this reason, avoiding nonsampling errors at the outset is a primary objective of all stages of survey design. The sections that follow this introduction describe some of the sources of this nonsampling error, and how the survey is designed and conducted to minimize such errors.

Random differences between the survey estimates and the population value, which occur because of the particular sample that was selected by chance, are known as sampling errors. The average sampling error, averaged over all possible samples, would be zero. Although the sampling error is nonzero and unknown for the particular sample chosen, the sample design permits sampling errors to be estimated. The final section, "Sampling Error," describes how the magnitude of the sampling error is estimated and presented for statistics given in this report.

## Nonsampling Error

Data from the 1987 Residential Energy Consumption Survey (RECS) are subject to many sources of nonsampling error and bias. Nonsampling error and bias are measures of variability due to the way the survey was conducted. They can include population undercoverage during sampling, response bias and variance, interviewer error, coding and/or keypunch-

ing 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. (For discussion of these procedures, see Appendix A, "How the Survey Was Conducted.") In addition, response adjustments and ratio estimations were incorporated into the survey estimator to help reduce both sampling and nonsampling error. These procedures also are discussed in Appendix A, "How the Survey Was Conducted."

## Noncovered Housing Units

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

- Vacant housing units. These units may have minimal heating for protection from the weather and lighting for security. The American Housing Survey (AHS) conducted by the Bureau of the Census estimated that there were 6.1 million vacant, year-round housing units in 1985.
- Second homes for the owner's use. The AHS estimates there were 2.2 million homes "held for occasional use" in 1985.

These two types of units are not included in the RECS survey primarily because of the difficulty in acquiring data and limitations in the availability of funds for the RECS. The RECS data are collected by interviewing someone who knows the housing unit and who can sign an authorization form for release of fuel records from the fuel supplier. That type of person is less likely to be available for vacant or second homes than for primary residences.

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

## **Sampling Unit Interview Error**

The design of the 1987 RECS included a longitudinal panel. This panel is a subsample of the entire 1987 RECS sample. Unfortunately, the interviewers sometimes made mistakes and interviewed the occupants of the wrong housing unit. This usually occurred in rural areas where the housing units did not have a street address. In the cases where this occurred for the longitudinal panel, the 1987 RECS data set would indicate that the housing unit was also sampled for the 1984 RECS data set when, in fact, a different housing unit was interviewed. This occurred an undetermined number of times. But there is evidence that it occurred at least 15 times out of the 2,065 longitudinal housing units in the 1987 RECS. These 15 units were discovered in a limited check among the 40 housing units where the percent change in the square footage from the 1984 RECS to the 1987 RECS was the largest. A more extensive check performed for the 1984 RECS revealed that this type of mistake occurred at least 50 times out of the 1,830 longitudinal housing units in the 1984 RECS.

## **Quality Control and Performance Statistics**

The RECS has begun collecting performance statistics on the data coding and editing phase of RECS work. Performance statistics are information about an ongoing process that provides feedback on how well the process is working. This information, first compiled for the 1984 RECS, provided useful input for decisions concerning the data collection and data editing procedures for the 1987 RECS. Several changes in the procedures were made for the 1987 RECS based on performance statistics from the 1984 RECS, including major changes in the keying verification and interviewer training procedures.

Keying errors that were not caught in the 1984 RECS were found to be more costly to correct at a later stage than if they were discovered and corrected in the initial data cleaning stage. Many of the keying errors were not initially detected because keying was verified only 25 percent of the time for some data items. To save costs in the later stage, all data items were 100 percent verified for the 1987 RECS.

For each interviewer that worked on the 1984 RECS, the number of errors was tabulated. Those interviewers who were also working on the 1987 RECS were given extra training in the areas where they had made errors

in their work on the 1984 RECS. Items with the largest number of errors also received special attention in the interviewer training for all interviewers.<sup>14</sup>

## **Quality of Specific Data Items**

### **Square Feet of Floorspace**

For each sampled dwelling, the square footage of the dwelling and the square footage of the heated floorspace is determined or estimated. (See "Estimates of Housing Unit Size" section in Appendix A, for a discussion of the square footage measurements.) Errors in the square footage of floorspace in a sampled dwelling can be made in several places. The interviewer can record incorrect measurements, forget to include some parts of the dwelling, include floorspace that is not part of the housing unit, or incorrectly label which areas are heated and which areas are not heated.

For housing units in the longitudinal panel, the interviewers attempted to obtain the square footage measurements during both the 1984 RECS and the 1987 RECS. An analysis of longitudinal housing units was made in order to study the order of the measurement error in the determination of the total square footage of a housing unit. All of the longitudinal housing units were used in the study with the following exceptions:

1. Housing units where it was determined that the wrong unit was interviewed for the 1984 RECS or the 1987 RECS.
2. Housing units where the square footage was imputed for either the 1984 RECS or the 1987 RECS.
3. Housing units where the respondents indicated that a change in the square footage was made between the two surveys.
4. Housing units whose occupants responded by mail for either the 1984 RECS or the 1987 RECS.

The results of the analysis showed a median percentage difference of 11 percent for total square feet (heated area plus unheated area). The percentage difference was the absolute value of the difference between the two measurements as a percentage of the average of the two measurements.

In addition to analyzing the housing units in the longitudinal panel, a comparison of the average total floorspace over all units in the samples was completed. This comparison revealed that the average total floorspace for the 1984 RECS was 1,672 square feet.

<sup>14</sup>For more information about RECS performance statistics, see Thomas B. Jabine, Review of Computer Edit and Update Performance Statistics for the Residential Energy Consumption Survey, report prepared for the Energy Information Administration, December 1987.

The average for the 1987 RECS was 1,733 square feet. This increase is statistically significant. The increase is most likely a result of improvements in the procedures used to obtain the square footage measurements and not a result of an actual increase in the average size of dwellings. In particular, the interviewers for the 1987 RECS were given special training on how to properly measure a housing unit. This training probably was the reason for the increase in the percentage of housing units (56 percent to 73 percent) where the square footage data could be based on a complete set of measurements. In addition, the quality of the measurements that were obtained most likely increased.

### Type of Housing Unit

The type of the housing unit was determined by the interviewer without the help of the respondent. The amount of interviewer error made in determining the

type of the housing unit can be studied using the housing units in the longitudinal panel. Table C1 presents a cross-tabulation of the 1984 RECS housing type and the 1987 RECS housing type for 2,049 longitudinal households. (The 15 cases where it was determined that different housing units were interviewed and the one case where the basement was converted to an apartment were not used in the table.)

Table C1 indicates that there are several areas where there is confusion among the interviewers on how to classify dwellings. The housing type that appears to cause the most confusion is "single-family attached" units. It is possible for some housing units to change type. This would occur if additional housing units are created in a building or if some residential space is converted to nonresidential usage. This occurrence is probably much smaller than the number of mistakes made by interviewers.

**Table C1. Housing Type for Longitudinal Households**

| Housing Type as Reported<br>In the 1984 RECS | Housing Type as Reported In the 1987 RECS |                               |                               |                                    |                                   |
|--|---|-------------------------------|-------------------------------|------------------------------------|-----------------------------------|
|  | Mobile<br>Home                            | Single-<br>Family<br>Detached | Single-<br>Family<br>Attached | Apartment<br>Building<br>2-4 Units | Apartment<br>Building<br>5+ Units |
| Mobile Home .....                            | 115                                       | 9                             | 0                             | 0                                  | 0                                 |
| Single-Family<br>Detached .....              | 9   | 1,265                         | 16                            | 20                                 | 1                                 |
| Single-Family<br>Attached .....              | 0   | 26                            | 53                            | 14                                 | 2                                 |
| Apartment Building<br>2-4 Units .....        | 0   | 10                            | 21                            | 209                                | 10                                |
| Apartment Building<br>5+ Units .....         | 0   | 0                             | 6                             | 10                                 | 269                               |

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, 1984 and 1987 Residential Energy Consumption Surveys.



*These mobile homes are some examples of housing units sampled in the RECS.*

**Table C2. Estimates for 1987 Household Income from CPS and RECS**  
(Thousands of Households)

| Income Category           | Number of Households         |                               |
|---------------------------|------------------------------|-------------------------------|
|                           | 1987 RECS<br>(November 1987) | CPS Estimates<br>(March 1988) |
| Total .....               | 90,537                       | 91,066                        |
| Less than \$5,000 .....   | 6,176                        | 6,271                         |
| \$5,000 - \$9,999 .....   | 11,489                       | 10,446                        |
| \$10,000 - \$14,999 ..... | 12,619                       | 9,658                         |
| \$15,000 - \$19,999 ..... | 9,014                        | 9,136                         |
| \$20,000 - \$24,999 ..... | 8,751                        | 8,406                         |
| \$25,000 - \$29,999 ..... | 7,926                        | 7,647                         |
| \$30,000 - \$34,999 ..... | 8,270                        | 7,017                         |
| \$35,000 - \$39,999 ..... | 5,626                        | 6,198                         |
| \$40,000 - \$44,999 ..... | 7,749                        | 9,479                         |
| \$50,000 - \$74,999 ..... | 8,677                        | 11,109                        |
| \$75,000 or Over .....    | 4,238                        | 5,700                         |

Sources: • Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, 1987 Residential Energy Consumption Survey. • U.S. Department of Commerce, Bureau of the Census, Current Population Survey.

### Income

Underreporting of income is often a problem in surveys similar to the RECS. Underreporting may be exacerbated in the RECS, which measures income by only one question. In comparison, the Current Population Survey (CPS) collected by the Bureau of the Census measures income by several questions; income questions are asked separately for each source of income

and each household member. Table C2 presents a comparison of the CPS estimates with the RECS estimates.

The underreporting of income on the 1987 RECS relative to the CPS is evident in the upper income categories. The 1987 RECS gives an estimate of 26.3 million households with an income of \$35,000 or more while the CPS estimates the number is 32.5 million households.

**Table C3. Definition of Poverty**

| Number of Persons<br>Per Family | Below 100 Percent of Poverty                     |                               | Below 125 Percent of Poverty                     |                                    |
|---------------------------------|--|-------------------------------|--|------------------------------------|
|                                 | 1987 RECS Income Range<br>Less Than <sup>a</sup> | Census Threshold <sup>b</sup> | 1987 RECS Income Range<br>Less Than <sup>a</sup> | 125 Percent Threshold <sup>b</sup> |
| <b>1 and—</b>                   |  |                               |  |                                    |
| Respondent 64 or Younger .....  | \$6,000  | \$5,909                       | \$7,500  | \$7,386                            |
| Respondent 65 or Older .....    | 5,000  | 5,447                         | 7,500  | 6,809                              |
| <b>2 and—</b>                   |  |                               |  |                                    |
| Householder 64 or Younger ..... | 7,500  | 7,641                         | 10,000   | 9,551                              |
| Householder 65 or Older .....   | 7,500  | 6,872                         | 9,000  | 8,590                              |
| <b>3 .....</b>                  | 9,000  | 9,056                         | 11,000   | 11,320                             |
| <b>4 .....</b>                  | 11,000   | 11,611                        | 15,000   | 14,514                             |
| <b>5 .....</b>                  | 14,000   | 13,737                        | 17,500   | 17,171                             |
| <b>6 .....</b>                  | 15,000   | 15,509                        | 20,000   | 19,386                             |
| <b>7 .....</b>                  | 17,500   | 17,649                        | 22,500   | 22,061                             |
| <b>8 .....</b>                  | 20,000   | 19,515                        | 25,000   | 24,394                             |
| <b>9 or More .....</b>          | 22,500   | 23,105                        | 30,000   | 28,881                             |

<sup>a</sup> The income category that contained the Census threshold was taken as the upper limit in defining poverty when the Census threshold was equal to or above the midpoint of the income category. For example, since the threshold of \$5,447 was not above the midpoint of the category \$5,000 to \$5,999, the next lower income category was used.

<sup>b</sup> Figures from the U.S. Bureau of the Census, **Money Income and Poverty Status of Families and Persons in the United States: 1987** (Advance Data from the March 1988 Current Population Survey) (**Current Population Reports**, Series P-60, No. 161, August 1988), Table A1, p.41.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, 1987 Residential Energy Consumption Survey.

## **Poverty Status**

The United States Bureau of the Census provides a threshold of poverty which is based on family income and the number of household members (Table C3). Households with incomes below the poverty threshold are defined as "Below 100 Percent of Poverty Line." Households with income below 125 percent of the poverty threshold are defined as "Below 125 Percent of Poverty Line."

Because the RECS income data were collected using categories of income, an exact match of Census thresholds could not be made. An additional source of error in the determination of poverty status is the nonsampling error in the reported income. The CPS estimate for households below 100 percent of poverty was 11,945,000 for March 1987. The 1987 RECS estimate was 11,768,000 households below 100 percent of poverty. The fact that the two estimates are very close together may be misleading. For example, the 1984 RECS estimate was 13,680,000 households below 100 percent of poverty, while the CPS estimate for 1984 was 11,887,000. The 1984 RECS report (Appendix C, "Quality of the Data.") incorrectly gave the CPS estimate as 13,886,000.

## **Gas Central Air Conditioning**

Some respondents incorrectly report that they have gas air conditioners when, in reality, they have electric air conditioners. The majority of the households claiming to have natural gas or LPG central air conditioning may actually have electric systems. Three possible explanations for these errors are as follows: (1) respondents may have confused Freon with the fuel running the compressor, (2) the housing unit was in an apartment building and the occupants did not know the type of fuel used in the central air-conditioning system, and (3) households with gas central forced-air heating systems and electric central air-conditioning systems may have thought they were both gas systems. (This may be especially true if one thermostat controls both systems.) In the 1987 RECS, an estimated 1.7 million households initially reported that they had gas air conditioners. After checking again with the respondents and with the rental agents, or looking for a pattern in the natural gas utility bills that indicated increased usage during periods of demand for air conditioning, the estimated number of households that used gas air conditioners was reduced to 0.6 million. This estimate still may be too high.

## **New Homes**

The RECS estimates of the number of homes constructed from 1985 through 1987 that use gas (natural gas or LPG) as the main heating fuel do not seem to agree with the U.S. Bureau of Census estimates pub-

lished in *Characteristics of New Housing: 1987*, U.S. Department of Housing and Urban Development. The RECS data indicate that 30.7 percent of homes (excluding mobile homes), constructed from 1985 through 1987 are heated with natural gas and 2.6 percent are heated with LPG. Census data indicate that 43.2 percent of new homes are heated with gas (natural gas or LPG). Data on heating fuels of newly constructed mobile homes are not available from Census data. The Census data covers all units completed any time during 1985 through 1987. The RECS data count units that were occupied as of the time the interview was attempted, which may be as early as September 1987. Hence, all units that were first occupied during the last part of 1987 may not be covered by RECS. The Census estimates are based on units completed but, not necessarily occupied, and even if the units are occupied, they may not be the primary residence. The RECS estimates are based on occupied units that are the primary residence of the occupants. The Census data give the fuel for the main heating equipment that was installed in the home. The RECS data give the fuel that the occupants indicate is the main space-heating fuel. Furthermore, after being occupied, the residents sometimes change the main heating fuel by installing wood stoves or portable heaters.

## **Weather (Degree-Days)**

Degree-days were assigned to housing units for the 1987 RECS from individual weather stations, as opposed to previous RECS surveys, where the degree-day data were from clusters of weather stations (a cluster of weather stations were those contained within an individual NOAA weather division. See the "Glossary" for the definition of NOAA division.) This change in the methodology from the cluster method to the station method will provide more accurate weather data for some households. The problem with using data from a cluster of weather stations is that some clusters contained a high variability in temperatures recorded among stations within the cluster. By selecting an appropriate, nearby weather station, it is believed that the difference between the temperatures actually experienced by a household and the temperature assigned to that household could be minimized. In selecting an appropriate, nearby weather station, distance was the major consideration but intervening mountain ranges and presence of bodies of water were also taken into account.

This change has made it more difficult to assess trends in degree-days when comparing the 1987 RECS with previous RECS. To assess the effect of this change, both methods were used to affix weather data to households for the 1984 RECS. The results from comparing the two methods indicate that, in general, at the national level, the change to individual weather stations has decreased the number of heating degree-days and increased the number of cooling degree-days (Table C4). The difference is particularly large in the West, where

**Table C4. Comparison of Heating Degree-Days Using Cluster Method Versus Station Method, April 1984 Through March 1985**

| Census Division          | Million Households | Heating Degree-Days |                |                    | Cooling Degree-Days |                |                    |
|--------------------------|--------------------|---------------------|----------------|--------------------|---------------------|----------------|--------------------|
|                          |                    | Cluster Method      | Station Method | Percent Difference | Cluster Method      | Station Method | Percent Difference |
| United States .....      | 86.328             | 4,686               | 4,518          | -3.6               | 1,153               | 1,293          | 12.1               |
| New England .....        | 4.269              | 6,398               | 6,331          | -1.0               | 524                 | 621            | 18.4               |
| Middle Atlantic .....    | 14.029             | 5,663               | 5,460          | -3.6               | 683                 | 822            | 20.3               |
| East North Central ..... | 15.203             | 6,524               | 6,427          | -1.5               | 685                 | 777            | 13.4               |
| West North Central ..... | 6.414              | 6,619               | 6,499          | -1.8               | 976                 | 1,076          | 10.2               |
| South Atlantic .....     | 14.777             | 2,951               | 2,979          | 0.9                | 1,768               | 1,819          | 2.8                |
| East South Central ..... | 5.784              | 3,651               | 3,512          | -3.8               | 1,433               | 1,583          | 10.5               |
| West South Central ..... | 8.764              | 2,443               | 2,444          | 0.1                | 2,361               | 2,431          | 2.9                |
| Mountain .....           | 4.512              | 5,728               | 5,158          | -10.0              | 1,102               | 1,550          | 40.6               |
| Pacific .....            | 12.577             | 3,508               | 3,019          | -13.9              | 873                 | 1,148          | 31.5               |

Note: The cluster method uses weather data from the set of weather stations in a NOAA weather division. The station method uses weather data from an individual weather station.

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

the Mountain Division and the Pacific Division had changes that were much larger than the changes at the national level. One reason for the large differences in the Pacific Division is that stations in California were clustered together on the basis of drainage areas, thus combining weather stations from mountainous areas with lowland areas. The reader may use degree-day data to make comparisons among subgroups within the 1987 RECS, but should avoid comparing degree-day data from the 1987 RECS with degree-day data from previous RECS.

In the 1987 RECS, when electricity was adjusted to include the amount of energy used to produce the electricity, the total average amount of energy used by a household was 161.7 million Btu. This contrasts with 100.8 million Btu when the 'site' value of electricity is used. If the 'adjusted' value of electricity is used, the proportion of energy used for space heating is 38 percent and the proportion used for appliances is 38 percent. As reported in this report, when the 'site' value of electricity is used, the proportion of energy used for space heating is 54 percent and the proportion of energy used for appliances is 23 percent.

## Adjusted Electricity

If the energy derived from the fossil fuels used to generate electricity is taken into account, then the totals in this report underrepresent the amount of energy consumed in the residential sector. It is estimated that approximately 3 Btu of fossil fuels are needed to generate and deliver 1 Btu of electricity to a housing unit. In this report, the total amount of energy used is obtained by adding the Btu value of fossil fuels consumed by households to the Btu value of electricity delivered to households. The difference between the Btu value of fossil fuels used to produce electricity and the Btu value of electricity delivered to households is excluded. The total amount of energy consumed would reflect this difference if the 'site' value of electricity is multiplied by 3 to yield the 'adjusted' value of electricity and the 'adjusted' value of electricity is used to calculate the total energy consumed.

## Space-Heating Intensity

The heating intensity is used to display the amount of energy used for space heating when the weather and size of housing unit have been standardized. There are two procedures to calculate the heating intensity for a category of households. Procedure 1 calculates the average value of the amount of energy used for space heating by households in the category, average heated floorspace of the housing units occupied by the households in the category, and the average number of heating degree-days experienced by the households in the category. The heating intensity then equals the average amount of energy divided by the average heated floorspace and by the average number of heating degree-days. Procedure 2 calculates an individual heating intensity for all households in the category. The heating intensity for the category is the average over

all households in the category of the individual heating intensities.

This report used Procedure 1 for calculating heating intensities. (See "Space-Heating Intensity" in the "Energy Consumption Patterns" section of this report for details of Procedure 1.) Procedure 2 is outlined below:

For each household that heated their home let HHHEATINT be the household heating intensity. Then

$$\text{HHHEATINT} = \frac{\text{BTUSPH}}{(\text{HDD} \times \text{HEATED})}$$

Where:

**BTUSPH** = the number of Btu of energy used for space heating,

**HDD** = the annual heating degree-days (base 65 degrees Fahrenheit) experienced by the household (if the annual heating degree-days equaled 0 then set HDD equal to 1),

and

**HEATED** = the heated floorspace of the housing unit.

If a household did not heat their home then set HHHEATINT equal to 0. The heating intensity for a category of households equals the average value of HHHEATINT over all households in the category.

Analogous definitions can be used to calculate the household heating intensity for specific fuels using Procedure 2. For example, the heating intensity for households that use natural gas as the main space-heating fuel is the average value of the household natural gas heating intensity over all households that use natural gas as the main space-heating fuel.

The two procedures will usually give a different value for the heating intensity. For the 1987 RECS, the procedure used in this report (Procedure 1) gives a natural gas heating intensity for households that use natural gas as the main space-heating fuel equal to 10.0 Btu per heating degree-days and per square foot. Procedure 2 gives a heating intensity equal to 12.6 Btu per heating degree-days and per square foot.

Procedure 2 usually gives a larger value for the heating intensity because the distribution of the household intensities is skewed in the positive direction. The households with the large values for the heating intensity tended to either live in small units or be located in

warm climates and, hence experience a small number of heating degree-days. In either case, the consumption of energy for space heating will tend to be smaller than average, but the decrease in the energy consumption will be less than the decrease in the amount of heated floorspace or the decrease in the number of heating degree-days.

Heating intensities for the *Residential Energy Consumption Survey: Consumption and Expenditures April 1984 Through March 1985, Part 2: Regional Data* were calculated using Procedure 2. No comparison was made between the heating intensities reported for the 1984 RECS and those reported for the 1987 RECS because of the change in the procedure that was used to calculate the intensity.

## Air-Conditioning Intensity

The air-conditioning intensity is used to display the amount of energy used for air conditioning when the weather and amount of cooled floorspace have been standardized. Analogous to heating intensity, there are two different procedures that can be used to calculate the air-conditioning intensity. In this report, the air-conditioning intensity is calculated using a procedure that corresponds to Procedure 1 for calculating the heating intensity. In particular, the air-conditioning intensity equals the average consumption of energy used for air conditioning divided by the average value for cooling degree-days (base 65 degrees Fahrenheit) and divided by the average number of cooled square feet. For individual housing units, the amount of cooled floorspace is not estimated from measurements of the cooled floorspace in the housing unit. Instead, the cooled square footage is given by the following formula:

$$\text{COOLED} = \text{HOMEAREA} \times \left( \frac{\text{NROOMSAC}}{\text{NROOMS}} \right)$$

Where:

**HOMEAREA** = total floorspace of the housing unit,

**NROOMS** = number of rooms in the housing unit,

and

**NROOMSAC** = number of rooms in the housing unit that can be air-conditioned during the summer.

## **Annualization of Energy Consumption and Expenditure Data**

### ***Usable Data***

Two steps were used to determine the annual consumption and expenditure amounts for electricity and natural gas. The first step was to determine if there was a sufficient amount of accurate billing data to calculate the annual consumption and expenditure amounts. The second step was to use predetermined annualization procedures to calculate an annual amount if the the billing data were adequate. If the billing data were missing or were not usable, the annual amounts were imputed using regression estimates.

For fuel oil, kerosene, and LPG, there was an additional step in determining the annual amounts. As with electricity and natural gas, if supplier data were available and usable, the annual amounts were based on the supplier data. If the supplier data were not available or not usable, then the next step was to determine if the respondent provided usable estimates of the annual amounts. If these estimates were available and usable, they were used. If both the billing data and respondent estimates were missing or not usable, the annual amounts were imputed using regression estimates.

### ***Comparison with 1984 RECS***

The proportion of households with usable fuel-consumption records was higher in 1987 than it was in 1984. The difference is 3 percentage points for electricity, 3 for natural gas, 5 for LPG, 12 for fuel oil, and 2 for kerosene.

For electricity and natural gas, three factors contributed to the increase. First, new procedures for annualizing records made it possible to use more fuel records, including those that were for relatively short periods and those where the household did not pay for all uses of the fuel. Second, data were collected for households who paid for utility bills that included another household. Third, refusal conversion techniques resulted in the elimination of supplier nonresponse.

For fuel oil and LPG, three factors contributed to the increase. First, the number of households with fuel included in rent declined. Second, data were used for households who pay for utility bills that included another household. Third, a greater number of usable bills were collected.

For kerosene, collection of household estimates during the household interview decreased the number of imputations.

Table C5 shows the availability of consumption records by the type of housing structure. Usable records were most often obtained for single-family units, more often for electricity (90.0 percent of the units) and natural gas (89.2 percent) than for fuel oil (75.1 percent), kerosene (71.8 percent) or LPG (67.3 percent). The problems inherent in collecting data for the storage fuels were described earlier: multiple suppliers, "cash-and-carry" customers, companies supplying purchase data instead of usage data, and economic instability of the supplying companies.

Most of the consumption and expenditure data for large apartment buildings, especially natural gas and fuel oil, are imputed data. Usable records were obtained for only 25.4 percent of the apartments in large buildings that used natural gas and none of those using fuel oil. Liquefied petroleum gas and kerosene are infrequently used in large apartment buildings. Electricity data for these apartments were obtained in 61.5 percent of the cases.

The reason data on consumption and expenditures are so often imputed for multiunit structures is that energy use is not directly metered for individual apartments. A master meter registers the usage for a number of units in the building. Under these circumstances, there is no way to measure the consumption of individual apartments directly.

Other segments of the data for which the lack of usable records may lead to an imputation bias include natural gas and fuel oil for apartments in smaller buildings (two to four units per building), and fuel oil and LPG used in mobile homes. Usable records in these segments were obtained for between 38.6 percent and 62.5 percent of the households.

### ***Annualization of Energy Bills: Electricity and Natural Gas***

The utilities provide the electricity and natural gas billing records, which typically cover a period of approximately 30 days. The bills were used to calculate the annual consumption and expenditure amounts.

The utility bills that were obtained from the electricity and natural gas utilities never exactly matched the optimal consumption period defined as January 1, 1987, through January 1, 1988. In addition, the vast majority of the households did not have a set of utility bills that covered exactly 365 days for a period that was close to the 1987 calendar year. As a result, an algorithm was developed that chooses which set of bills to use to compute the annual consumption and expenditures.

**Table C5. Energy-Consumption Records and Missing Data for Surveyed Households, by Fuels Used and Type of Housing Structure  
(Percent of Households)**

| Type of Fuel Used   | Total Households Using the Fuel | Mobile Home | Single-Family | Two to Four Units | Five or More Units |
|---|---------------------------------|-------------|---------------|-------------------|--------------------|
| Electricity .....   | 100.0                           | 100.0       | 100.0         | 100.0             | 100.0              |
| (Sample Number) .....   | (6,228)                         | (365)       | (4,087)       | (775)             | (1,001)            |
| Usable Record .....   | 82.8                            | 81.9        | 90.0          | 72.4              | 61.5               |
| Unusable Record <sup>a</sup> .....  | 0.9                             | 1.1         | 0.5           | 1.0               | 2.5                |
| Records Not Available .....   | 8.8                             | 8.2         | 8.2           | 11.5              | 9.2                |
| Fuel Used Is Included In<br>Rent or Paid in Other Ways <sup>b</sup> ..... | 7.5                             | 8.8         | 1.2           | 15.1              | 26.8               |
| Natural Gas .....   | 100.0                           | 100.0       | 100.0         | 100.0             | 100.0              |
| (Sample Number) .....   | (3,991)                         | (142)       | (2,538)       | (614)             | (697)              |
| Usable Record .....   | 73.4                            | 73.9        | 89.2          | 62.5              | 25.4               |
| Unusable Record <sup>a</sup> .....  | 1.9                             | 4.9         | 1.6           | 2.4               | 1.9                |
| Records Not Available .....   | 7.9                             | 6.3         | 7.8           | 11.9              | 5.0                |
| Fuel Used Is Included In<br>Rent or Paid in Other Ways <sup>b</sup> ..... | 16.8                            | 14.8        | 1.3           | 23.1              | 67.7               |
| Fuel Oil .....  | 100.0                           | 100.0       | 100.0         | 100.0             | 100.0              |
| (Sample Number) .....   | (952)                           | (35)        | (611)         | (132)             | (174)              |
| Usable Record .....   | 55.7                            | 57.1        | 75.1          | 38.6              | (€)                |
| Unusable Record <sup>a</sup> .....  | 7.1                             | 14.3        | 9.0           | 6.1               | (€)                |
| Records Not Available .....   | 12.9                            | 28.6        | 15.5          | 12.9              | 0.6                |
| Fuel Used Is Included In<br>Rent or Paid in Other Ways <sup>b</sup> ..... | 24.3                            | (€)         | .3            | 42.4              | 99.4               |
| Kerosene .....  | 100.0                           | 100.0       | 100.0         | 100.0             | 100.0              |
| (Sample Number) .....   | (414)                           | (64)        | (323)         | (19)              | (8)                |
| Usable Record .....   | 69.1                            | 59.4        | 71.8          | 68.4              | (3)                |
| Unusable Record <sup>a</sup> .....  | 2.7                             | 7.8         | 1.9           | (€)               | (€)                |
| Records Not Available .....   | 28.0                            | 32.8        | 26.3          | 31.6              | (4)                |
| Fuel Used Is Included In<br>Rent or Paid in Other Ways <sup>b</sup> ..... | 0.2                             | (€)         | (€)           | (€)               | (1)                |
| LPG .....   | 100.0                           | 100.0       | 100.0         | 100.0             | 100.0              |
| (Sample Number) .....   | (543)                           | (128)       | (407)         | (4)               | (4)                |
| Usable Record .....   | 63.9                            | 56.3        | 67.3          | (1)               | (€)                |
| Unusable Record <sup>a</sup> .....  | 8.7                             | 14.1        | 7.1           | (€)               | (€)                |
| Records Not Available .....   | 21.9                            | 16.4        | 23.1          | (2)               | (2)                |
| Fuel Used Is Included In<br>Rent or Paid in Other Ways <sup>b</sup> ..... | 5.5                             | 13.3        | 2.5           | (1)               | (2)                |

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

<sup>b</sup> These data exclude households that paid for some, but not all, uses of a fuel.

<sup>c</sup> Represents or rounds to zero.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, 1987 Residential Energy Consumption Survey.

The algorithm used the period covered by the bills and the presence of estimated bills in determining which set of bills to use. The algorithm balanced the desire for a set of utility bills that cover exactly 365 days, the desire for a set that begins near January 1, 1987, and ends near January 1, 1988, and the desire to avoid estimated bills.

The annualization procedure used (1) the sum of the consumption amounts and the sum of the expenditures for the set of chosen bills, and (2) the ratio of a preliminary regression estimate of energy consumption for a 365-day period to a preliminary regression estimate of energy consumption for the period covered by the set of chosen bills. The annual consumption was the sum

of the consumption amounts times the ratio. The annual expenditures was the sum of the expenditures times the ratio.

The preliminary regression estimates of consumption were based on a preliminary regression equation that was developed using data from the 1984 RECS. This preliminary regression equation had the following constraints: (1) If fuel was not used for space heating or air conditioning, the preliminary regression equation did not involve degree-days. (In this case, the ratio equals 365 divided by the number of days covered by the set of bills.) (2) If the fuel is used for space heating, the equation was a linear function of the number of heating degree-days. (3) If the fuel is used for air con-

ditioning, the equation was a linear function of the number of cooling degree-days.

A minimum number of days of utility bills was required for the annualization procedure to be used. The number of days was dependent on the end uses for which the fuel was used. If electricity was not used for space heating or air conditioning, and if 60 or more days of utility data were available, the annualization procedure was used. If electricity was used for space heating or air conditioning, the minimum number of days was 146. The same minimum number of days was also used for natural gas. In the cases where the utility bills did not cover the minimum number of days, the annual amount was imputed using a regression equation that was developed using the observations from the 1987 RECS where the utility data were usable. These regression equations are presented in Appendix B, "End-Use Estimation Methodology."

### ***Annualization of Energy Bills: Fuel Oil, Kerosene, and LPG***

Unlike metered types of energy (electricity and natural gas), fuel oil, kerosene, and LPG are purchased at discrete times. Hence, the supplier data for these fuels will reflect the amount purchased and the date purchased, but not the exact amount consumed for a given period of time.

Under optimal conditions, all of the fuel suppliers identified by the household would be able to supply the billing records of all the purchases for the 1987 calendar year. If the assumption is made that the amount purchased equals the amount consumed then the annual consumption and expenditures could be obtained by summing the amount purchased and the amount paid over all purchases that occurred during the 1987 calendar year. This was done whenever the fuel suppliers provided adequate data.

In some instances, the fuel suppliers provided purchase records that covered a 12-month period other than the 1987 calendar year. In these instances, the annual consumption and expenditures were set equal to the sum of the data obtained from the fuel purchase records for the available 12-month period. In most of these cases, the household had moved into the housing unit during 1987. Consequently, fuel purchase records would not exist for the full 1987 calendar year.

Kerosene used in portable heaters is usually purchased in small amounts on a cash-and-carry basis. Hence, the supplier would rarely have records that indicate the amount purchased and the amount paid for the purchase. Households that used kerosene were asked to provide an estimate of the amount and the cost of kerosene that they purchased during the past 12 months. When no supplier data for kerosene were available, the household estimate was used. Household estimates

were also used for fuel oil and LPG, but much less frequently.

If the supplier data for fuel oil, kerosene, or LPG were not usable and the respondent estimates were not usable, the annual consumption and expenditure amounts were imputed using regression equations that were developed from the 1987 RECS observations where the supplier data were usable. These regression equations are presented in Appendix B, "End-Use Estimation Methodology."

### ***Adjustments to Annual Amounts***

For a small percentage of households, the annual consumption and expenditures were reduced in response to respondent-supplied information about the proportion of the fuel used for nonhousehold purposes such as drying grain, operating a commercial welding shop, or the use in another household. This adjustment was made to the consumption and expenditures for 3 percent of the households using electricity, 2 percent using LPG, 2 percent using natural gas, and 2 percent using fuel oil or kerosene. The aggregate weighted amount of energy consumption removed was 43 trillion Btu of electricity, 24 trillion Btu of natural gas, 6 trillion Btu of LPG, 3 trillion Btu of fuel oil and kerosene.

### ***Date Chosen for Population Calculations***

The weights for the respondents were adjusted so that the sum of the weights over all respondents equaled 90.537 million. (See Appendix A, "Survey Estimation" section.) This is the estimate of the number of households as of November 1987. It was obtained by interpolating between the March 1987 and March 1988 CPS estimates. (The March 1987 CPS estimates equaled 89.479 million and the March 1988 CPS estimates equaled 91.066 million.) Using the same linear estimation procedure the estimate for the number of households as of January 1987 equals 89.214 million and the number as of December 1987 equals 90.669 million.

November 1987 was chosen as the date to estimate the number of households because it was approximately the midpoint of the period in which the majority of the personal interviews were conducted, and it was consistent with the procedures for previous RECS. The use of this date to estimate the population size means that the estimated number of households with various characteristics will be an estimate of the number as of November 1987 (a date close to the actual interview date for most of the respondents).

The use of November 1987 CPS estimates of the number of households will be bias of the estimates of the total annual consumption and the total annual expenditures in a positive direction. This is because the an-

nual consumption for all respondents was estimated as if all of the households were in existence for the full year, when, in reality, some of the households did not exist at the start of the year. As noted above, the estimated number of households increased from 89.214 million in January 1987 to 90.669 million in December 1987. An alternative would have been to use 89.941 million (the average of the January and December estimates) as the control total for the national number of households.

The November estimate of the number of households (90.537 million) is .66 percent larger than the average of the January and December estimates (89.941 million). This is approximately the amount that the total national energy consumption was overestimated because of the use of November as the date to estimate the number of households. On the other hand, the per household energy consumption and expenditures statistics were not affected by a change in the control total.

Previous RECS estimated the consumption from April through March. Using interpolation, the CPS estimate of the number of households as of April 1987 equals 89.611 million. The March 1988 CPS estimate of the number of households equals 91.066 million. The average of these two estimates equals 90.339 million. The November 1987 CPS estimate (90.537 million) is .22 percent larger than 90.339 million. One effect of changing to the calendar year is to increase the bias of the total consumption estimates (based upon the estimated population count) from .22 percent to .66 percent.

## Sampling Error

The form of the sampling error that is presented here is the relative standard error (RSE). The RSE is also known as the coefficient of variation. For a given survey statistic,  $Y$ , the relative standard error, RSE ( $Y$ ), is given by:

$$RSE(Y) = (S_Y / Y) \times 100.$$

Thus the standard error of  $Y$  is given by:

$$S_Y = RSE(Y) \times Y / 100.$$

This section provides an explanation and example of the procedures used to calculate approximate RSE's for each statistic shown in the "Detailed Statistics" of this report. This section also includes a discussion of the derivation of the procedures used to calculate the approximate RSE's. It also includes an explanation of the procedures used to calculate the RSE's for ratios.

## Balanced Half-Sample Replication

For some surveys, a convenient algebraic formula for computing variances can be obtained. However, the RECS used a multistage area sample design of such complexity (see Appendix A, "How the Survey Was Conducted") that it is virtually impossible to construct an exact algebraic expression for estimating variances. Instead, the method used to estimate sampling variances for this survey was balanced half-sample replication. 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. The strata were collapsed to 85 new strata to achieve this pairing of PSU's. Of these 85 strata, 44 consisted of two non-self-representing PSU's belonging to the same Census Divisions, with one PSU constituting each member of a pair. Of the remaining 41, 32 strata were each composed of one self-representing PSU; that is, they consisted of large metropolitan areas that came into the sample with certainty. In each of the latter strata, all of the PSU's were treated as a composite PSU, while the segments within the composite PSU were segregated into two groups representing the two members of a pair. There was no between-PSU component of variance for self-representing PSU's. The 9 remaining strata consisted of a non-self-representing PSU that was treated as if it were a self-representing PSU. These 9 unmatched non-self-representing PSU's were not matched due to a desire to match within the 9 Census divisions and the desire to treat Alaska and Hawaii as 2 separate and unique strata.

Half-sample replication involved repeatedly drawing pair members from the 85 strata. Each replication was called a "half-sample" because only one member of the pair within each of the 85 strata was selected. For each half-sample, the sampling weights were ratio adjusted upward. The result of the adjustment is that the sum of the weights for each of the 12 cells (four Census regions by three types of Metropolitan Statistical Areas (MSA)) equals the appropriate control total. (See Appendix A, "How the Survey Was Conducted," Table A9.) In this way, each half-sample can produce unbiased survey statistics based on roughly one-half of the data. Using different combinations of members from the 85 pairs, it is possible to produce a total of  $2^{85} = 3.9 \times 10^{25}$  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. The use of ratio adjustments in RECS means that even a statistic giving the number of households in a category is not a linear statistic. For nonlinear survey statistics, the variance estimate computed using the method of balanced half-samples is approximately

equal to the variance estimate computed using all possible half-samples. With this balancing method, each half-sample is constructed by using an orthogonal matrix to control the selection of pair members from strata. For the RECS, 128 balanced half-samples were used in variance estimation.

The variances are estimated from the half-sample statistic in the following way. Let  $Y'$  be a survey estimate of the population value  $Y$  (for example, the total amount of electricity consumed in housing units). Then, the estimated variance of  $Y'$  is given by:

$$S_{Y'}^2 = (1 / 128) \sum_{i=1}^{128} (Y'_i - Y')^2,$$

where  $Y'_i$  is the  $i$ th half-sample estimate of  $Y$ . The standard error of  $Y'$  is given by:

$$S_{Y'} = \sqrt{S_{Y'}^2}.$$

The same procedure was used to estimate the variance of the number of housing units that have a certain characteristic. (For example, the number of housing units where the main space-heating fuel is natural gas.)

As mentioned previously in this section, and in Appendix A, "How the Survey Was Conducted," the national total number of households is not estimated from the survey results. The household weights are ratio adjusted so that the total weighted number of households equals the number obtained from the CPS. The same is true for the total number of households in the 12 cells mentioned in this section (four Census regions by three types of MSA designations). The variance estimation procedure used for RECS assumes that the CPS numbers are exact and are not subject to error. Any error in the CPS results can be considered as a bias in the RECS results and not as part of the sampling error for RECS. The weights for each half-sample are also constructed such that the national total and the total for the 12 cells match the CPS numbers. As a result, the half-sample estimate for the RSE of the national total of the number of households and the RSE's

for the totals in the 12 cells will always be zero. Also the half-sample estimate of the RSE will be close to zero whenever the statistic involved is a household count that is close to a control total. Examples of this are the national total for the number of households that use electricity and the number of households that have not received assistance for weatherization of their residence.

## Row and Column Factors

The method of presenting the RSE's of a statistic in this report utilizes row and column factors. The row and column factors can be used to calculate an approximate RSE for each statistic.

To estimate the RSE of a statistic in the  $i$ th row and  $j$ th column of a particular table, the approximation  $RSEA(i, j)$  for the original half-sample estimate  $RSE(i, j)$  is given by the formula.

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

where:

$R(i)$  is the RSE row factor given in the last column of the row  $i$  and,

$C(j)$  is the RSE column factor given at the top of column  $j$ .

The following example illustrates this procedure.

Using the third column of the table (Figure C1) labeled "Electricity" and the second row labeled "Northeast" gives an estimate of \$27.78 for the average cost of 1 million Btu of electricity in the Northeast Census Region. The RSE row factor is  $R(2) = 1.76$ . The RSE column factor is  $C(3) = 0.661$ . The approximate RSE for the estimate is, therefore,

$$RSEA(2, 3) = (1.76)(.661) = 1.16\%.$$

**Figure C1. Use of RSE Row and Column Factors**

**Table 22. Household Average Energy Prices, 1987**  
(Dollars per Million Btu)

| Household Characteristics         | Average Energy Prices |             |             |                      |                         | RSE Row Factors |
|-----------------------------------|-----------------------|-------------|-------------|----------------------|-------------------------|-----------------|
|                                   | All Fuels             | Natural Gas | Electricity | Fuel Oil or Kerosene | Liquefied Petroleum Gas |                 |
| RSE Column Factors:               | 0.825                 | 0.783       | 0.661       | 0.907                | 2.583                   |                 |
| <b>Total U.S. Households</b>      | 10.71                 | 5.41        | 22.34       | 5.89                 | 8.91                    | 1.37            |
| <b>Census Region and Division</b> |                       |             |             |                      |                         |                 |
| Northeast                         | 10.26                 | 6.45        | 27.78       | 5.79                 | 13.24                   | 1.76            |
| New England                       | 10.09                 | 6.75        | 26.16       | 5.91                 | 11.93                   | 2.00            |
| Middle Atlantic                   | 10.30                 | 6.40        | 28.24       | 5.74                 | 14.48                   | 2.29            |
| Midwest                           | 9.18                  | 4.93        | 23.09       | 5.97                 | 7.58                    | 2.18            |
| East North Central                | 9.17                  | 5.01        | 23.77       | 6.01                 | 8.18                    | 2.47            |
| West North Central                | 9.19                  | 4.69        | 21.60       | 5.74                 | 6.52                    | 3.38            |
| South                             | 12.82                 | 5.53        | 20.61       | 6.29                 | 9.56                    | 2.75            |
| South Atlantic                    | 13.93                 | 6.50        | 21.57       | 6.24                 | 11.15                   | 2.99            |
| East South Central                | 11.79                 | 4.92        | 17.50       | 6.53                 | 9.14                    | 2.87            |
| West South Central                | 11.77                 | 4.81        | 21.31       | 6.11                 | 6.96                    | 5.92            |
| West                              | 10.53                 | 5.05        | 20.76       | 6.11                 | 9.30                    | 4.92            |
| Mountain                          | 9.12                  | 4.54        | 21.26       | 5.54                 | 6.41                    | 10.95           |
| Pacific                           | 11.21                 | 5.34        | 20.58       | 6.27                 | 11.35                   | 4.49            |
| <b>Metropolitan Status</b>        |                       |             |             |                      |                         |                 |
| Metropolitan                      | 10.62                 | 5.47        | 23.03       | 5.85                 | 9.72                    | 1.57            |
| Central City                      | 9.89                  | 5.48        | 23.25       | 5.57                 | 11.57                   | 2.67            |
| Outside Central City              | 11.14                 | 5.47        | 22.91       | 6.00                 | 9.45                    | 1.85            |
| Nonmetropolitan                   | 11.06                 | 5.10        | 20.27       | 6.04                 | 8.34                    | 2.45            |

$$R \text{ (Northeast)} = 1.76$$

$$C \text{ (Electricity)} = 0.661$$

Approximate RSE (Average Electricity Price in Northeast)

$$= (1.76) \cdot (0.661)$$

$$= 1.16 \text{ percent}$$

Approximate Standard Error (Average Electricity Price in Northeast)

$$= (1.16/100) \cdot (27.78)$$

$$= 0.32 \text{ Dollars per Million Btu}$$

Approximate 2 Standard Errors (95 percent Confidence interval)

$$= (1.96) \cdot (0.32)$$

$$= 0.63 \text{ Dollars per Million Btu}$$

Therefore, with 95 percent confidence, the average electricity price in the Northeast is between 27.15 and 28.41 dollars per million Btu ( $27.78 \pm 0.63$ ).

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy End Use Division, the 1987 Residential Energy Consumption Survey.

The row and column factors are determined from a two-factor analysis of the table of RSE's on the basis of the equation,

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

The least squares estimates for this equation are given by:

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

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

$$b(j) = \overline{(\log RSE)}_j - \overline{(\log RSE)}$$

where:

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

$\overline{(\log RSE)}_i$  is the mean over all columns j for a particular row i, and

$\overline{(\log RSE)}_j$  is the mean over all rows i for a particular column j.

The row and column RSE factors are then computed as:

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

$$C(j) = \text{antilog } b(j) =$$

$$\text{antilog} \left( \overline{(\log RSE)}_j - \overline{(\log RSE)} \right).$$

The RSE row factor,  $R(i)$ , is the geometric mean of the RSE's in row i. The RSE column factor,  $C(j)$ , is an adjustment factor with geometric mean equal to 1.0.<sup>15</sup>

The estimation procedure used to obtain the row and column factors does not use RSE's that are less than 1.0 percent or greater than 50.0 percent. In addition, if the statistic for a cell is not listed for any reason, the RSE for that cell is not used in the procedure. This convention is used because the product of the row and column factors frequently is an inaccurate estimate for

these RSE's. Using these cells in the calculation of the row and column factors may result in factors that give inaccurate RSE estimates for other cells.

Whenever a household count is a control total, its RSE is zero. An example is the cell in the first row and first column of Table 7. This cell contains an estimate of the national total of households as of November 1987. Because the RSE is zero, this cell was not used in the procedure used to determine the row and column factors. The RSE as estimated by the row-column calculations will overestimate the RSE for this cell and all other cells that contain control totals.

## Determination of the Relative Standard Error for Ratios

The following equation provides an approximate RSE for ratios not presented in the tables. (A more accurate procedure for the case where the ratio involves two household counts where the numerator is a subset of the denominator is presented in *Housing Characteristics 1987 Appendix C*.)

$$RSE(X/Y) = \sqrt{[RSE(X)]^2 + [RSE(Y)]^2}$$

The following example illustrates this equation. The average price of natural gas in the Northeast is 6.45 dollars per million Btu (See Table 22). The average price of LPG in the Northeast is 13.24 dollars per million Btu. This gives an estimate of  $13.24/6.45 = 2.05$  as the ratio of the LPG price to the natural gas price in the Northeast. The approximate RSE (as determined by row-column method) for the LPG price was 4.55 percent. The approximate RSE for the natural gas price was 1.38 percent. An estimate of the RSE of the ratio is:

$$RSE(X/Y) = \sqrt{(4.55)^2 + (1.38)^2} = 4.75.$$

The half-width for the 95 percent confidence interval is:

$$1.96 \times .0475 \times 2.05 = .19.$$

The confidence interval for the ratio is  $2.05 (\pm 0.19)$ .

<sup>15</sup>For detailed discussions of the accuracy of the RSE approximation, the procedure for estimating confidence intervals, and the statistical tests of hypotheses, see *Nonresidential Buildings Energy Consumption Survey: Commercial Buildings, Consumption and Expenditures, 1983*. DOE/EIA-0318(83). (Washington, D.C., October 1986).

## Determination of the Standard Error of the Difference Between Two Statistics

The procedure used to compute the standard error of the difference between two statistics follows:

$$SE_{x_1-x_2} = \sqrt{SE_{x_1}^2 + SE_{x_2}^2}.$$

This procedure assumes the two statistics are not correlated. Using the above example, the standard error of the average LPG price in the Northeast is 0.60 dollars per million Btu. (The RSE is 4.55 percent.) The standard error of the average natural gas price in the

Northeast is 0.09 dollars per million Btu. (The RSE is 1.38 percent.) The difference between the average prices is 6.79 dollars per million Btu. The standard error of this difference is:

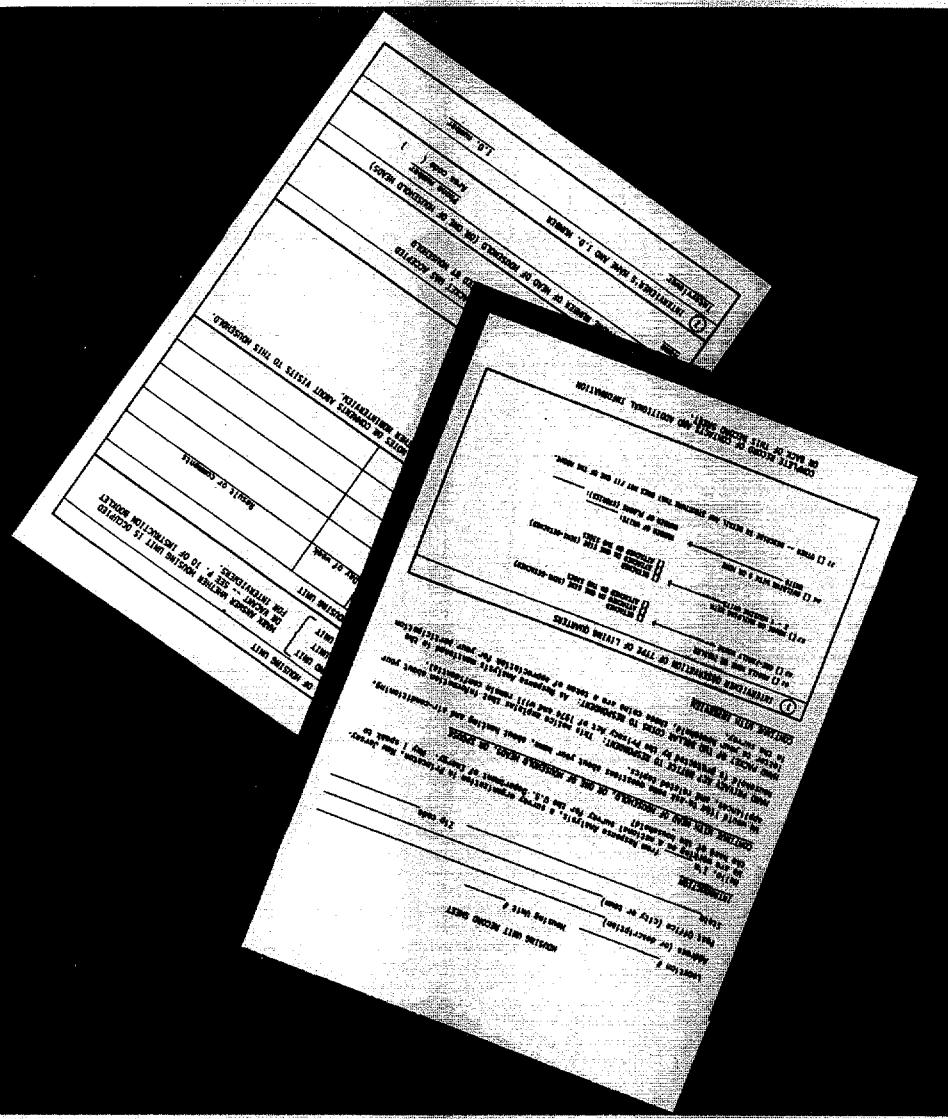
$$SE_{x_1-x_2} = \sqrt{(0.60)^2 + (0.09)^2} = 0.61$$

If 1.96 times the standard error is greater than the difference between the statistics the difference is not statistically significant. In this example, 1.96 times the standard error equals 1.20 dollars per million Btu, while the difference equals 6.79 dollars per million Btu. Therefore, it can be said that there is a statistically significant difference between the average price of LPG and average price of natural gas in the Northeast Census Region.



## **Survey Forms**

## **Appendix D**





## **Appendix D**

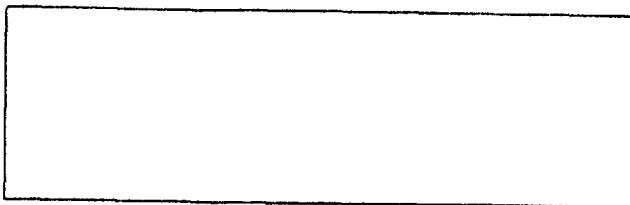
### **Survey Forms**

This appendix contains copies of the following data collection forms used in the 1987 Residential Energy Consumption Survey (RECS). Forms EIA-457A through C were used in the housing portion of the RECS. Forms EIA-457D through G were mailed to energy suppliers.

- EIA-457A Housing Unit Record Sheet (actual form was pink).
- EIA-457B Household Questionnaire (actual form had a blue cover).
- EIA-457C Rental Agent Form (actual form was white).
- EIA-457D Liquefied Petroleum Gas (actual form was blue).
- EIA-457E Electricity Usage (actual form was yellow).
- EIA-457F Utility Gas Usage (actual form was pink).
- EIA-457G Fuel Oil or Kerosene (actual form was green).

## 1987 Residential Energy Consumption Survey

### HOUSING UNIT RECORD SHEET



Address (or description) \_\_\_\_\_

Post Office (city or town) \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

#### INTRODUCTION

Hello I'm \_\_\_\_\_ from Response Analysis, a survey organization in Princeton, New Jersey. We are working on a national survey for the U.S. Department of Energy. May I speak to the head of household, that is, the person in whose name the home is owned or rented?

#### CONTINUE WITH HOUSEHOLDER, ONE OF HOUSEHOLDERS, OR SPOUSE/PARTNER.

We would like to ask some questions about your home, about heating and air-conditioning, household vehicles, and related topics.

HAND PRIVACY ACT NOTICE TO RESPONDENT. This notice explains that information about your household is protected by the Privacy Act of 1974 and will remain confidential.

#### CONTINUE WITH INTERVIEW

##### ① INTERVIEWER OBSERVATION OF TYPE OF LIVING QUARTERS

###### MARK BOX BELOW:

11 [ ] MOBILE HOME OR TRAILER

21 [ ] ONE-FAMILY HOUSE--DETACHED

22 [ ] ONE-FAMILY HOUSE--ATTACHED ON ONE SIDE (SEMI-DETACHED)

23 [ ] ONE-FAMILY HOUSE--ATTACHED ON TWO SIDES

31 [ ] HOUSE OR BUILDING WITH 2-4 HOUSING UNITS--DETACHED

32 [ ] HOUSE OR BUILDING WITH 2-4 HOUSING UNITS--ATTACHED ON ONE SIDE (SEMI-DETACHED)

33 [ ] HOUSE OR BUILDING WITH 2-4 HOUSING UNITS--ATTACHED ON TWO SIDES

41 [ ] BUILDING WITH 5 OR MORE HOUSING UNITS

MARK ANSWERS:

NUMBER OF HOUSING UNITS: \_\_\_\_\_

NUMBER OF FLOORS (STORIES): \_\_\_\_\_

51 [ ] OTHER--DESCRIBE IN DETAIL ANY STRUCTURE THAT DOES NOT FIT ONE OF ABOVE. (INCLUDE NUMBER OF UNITS AND FLOORS)

\_\_\_\_\_  
\_\_\_\_\_

COMPLETE RECORD OF CONTACTS AND ADDITIONAL INFORMATION ON BACK OF THIS RECORD SHEET.

(2)

TYPE OF OCCUPANCY OF HOUSING UNIT

- 1 [ ] YEAR-ROUND UNIT  
 2 [ ] SEASONAL UNIT  
 3 [ ] MIGRATORY UNIT

MARK ANSWER WHETHER HOUSING UNIT IS OCCUPIED OR VACANT -- SEE P. 2-18 OF INSTRUCTIONS FOR INTERVIEWERS.

(3) RECORD OF VISITS TO HOUSING UNIT

| Visit number | Time of day (include AM or PM) | Date | Day of Week | Result or Comments |
|--------------|--------------------------------|------|-------------|--------------------|
|              |                                |      |             |                    |
|              |                                |      |             |                    |
|              |                                |      |             |                    |
|              |                                |      |             |                    |

- (4) USE THIS SPACE FOR ADDITIONAL NOTES OR COMMENTS ABOUT VISITS TO THIS HOUSEHOLD.  
 DESCRIBE FULLY IF REFUSAL OR OTHER NONINTERVIEW.

(5) NAME AND PHONE NUMBER OF HOUSEHOLDER (OR ONE OF HOUSEHOLDERS)

Name \_\_\_\_\_

Phone number \_\_\_\_\_

Area Code ( ) \_\_\_\_\_

(6) INTERVIEWER'S NAME AND I.D. NUMBER

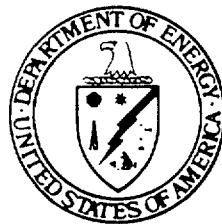
Interviewer \_\_\_\_\_

I.D. number \_\_\_\_\_

Form Approved  
OMB No. 1905-0092. EIA 457B  
(Expires May 31, 1990.)

This survey is voluntary and authorized under the Federal Energy Administration Act of 1974 (Public Law 93-275) as amended. Information about specific households will be kept strictly confidential. The data will be summarized within large groupings for statistical purposes.

## 1987 Residential Energy Consumption Survey



Energy Information Administration  
U.S. Department of Energy

|                      |         |
|----------------------|---------|
| Location # _____     | 111-116 |
| Housing Unit # _____ | 117-118 |

TIME INTERVIEW STARTED

AM  
PM

1. In what year did your family move into this (house/apartment)?

01 [ ] Before 1940      07 [ ] 1980-1983  
02 [ ] 1940-1949      08 [ ] 1984  
03 [ ] 1950-1959      09 [ ] 1985  
04 [ ] 1960-1969      10 [ ] 1986  
05 [ ] 1970-1974      11 [ ] 1987  
06 [ ] 1975-1979      12 [ ] 1988

121-  
122

--ASK Q. 2

IF "1985" OR LATER, ASK:

2. In which month did you move in?  
(SPECIFY MONTH AND ENTER LAST DIGIT OF YEAR.)

MONTH:

123-124

YEAR: 198

3. In what year was this (house/building) built?  
Just your estimate.

01 [ ] BEFORE 1940      07 [ ] 1980-1983  
02 [ ] 1940-1949      08 [ ] 1984  
03 [ ] 1950-1959      09 [ ] 1985  
04 [ ] 1960-1969      10 [ ] 1986  
05 [ ] 1970-1974      11 [ ] 1987  
06 [ ] 1975-1979      12 [ ] 1988

125-  
126

4. Altogether (counting all areas that are used as year-round living space), how many rooms do you have in your living quarters? Do not count bathrooms, unheated porches, foyers, or hallways. (SEE INSTRUCTION BELOW.)

NUMBER  
OF ROOMS:

127-128

5. How many complete bathrooms and how many half-bathrooms do you have? (A complete bathroom is a room with a flush toilet, bathtub or shower, and a sink/washbasin with running water. A half-bath has at least a flush toilet or bathtub or shower, but does not have all the facilities for a complete bathroom.)

NUMBER OF  
COMPLETE BATHROOMS:

NUMBER OF  
HALF BATHROOMS:

[ ] NONE

[ ] NONE

129

130

#### INTERVIEWER INSTRUCTIONS:

Q. 4 -- Generally count any room as long as it is a comfortable place to rest, read, study, etc., year-round.

Do not count laundry rooms, unfinished attics or basements, open porches, or unfinished space used for storage.

HAND RESPONDENT EXHIBIT 6/7/10

6. What is the main fuel used for heating your home?  
 (SEE INSTRUCTIONS BELOW.)

|   | Q. 6<br>MAIN FUEL<br>(MARK<br>ONLY ONE) | Q. 7<br>MARK<br>ALL THAT<br>APPLY | 131-<br>132 |
|---|---|-----------------------------------|-------------|
| GAS FROM UNDERGROUND PIPES SERVING THE NEIGHBORHOOD . . . . .               | 01 [ ]                                  | [ ]                               | 133         |
| LPG GAS (BOTTLED OR TANK GAS) . . . . .                                     | 02 [ ]                                  | [ ]                               | 134         |
| FUEL OIL . . . . .  | 03 [ ]                                  | [ ]                               | 135         |
| KEROSENE OR COAL OIL . . . . .  | 04 [ ]                                  | [ ]                               | 136         |
| ELECTRICITY . . . . .   | 05 [ ]                                  | [ ]                               | 137         |
| COAL OR COKE . . . . .  | 06 [ ]                                  | [ ]                               | 138         |
| WOOD . . . . .  | 07 [ ]                                  | [ ]                               | 139         |
| SOLAR COLLECTORS . . . . .  | 08 [ ]                                  | [ ]                               | 140         |
| OTHER (SPECIFY): _____  |   |                                   |             |
|   | 21 [ ]                                  | [ ]                               | 141         |
| DON'T KNOW . . . . .  | 96 [ ]                                  | [ ]                               | 142         |
| NO HEATING FUEL USED -- TAKE BACK<br>EXHIBIT 6/7/10; SKIP TO Q. 32. . . . . | 00 [ ]                                  |                                   |             |
| NO ADDITIONAL FUEL --<br>SKIP TO Q. 9 . . . . .                             |   | [ ]                               | 143         |

7. What other fuels, if any, are used to heat your home -- including those that are used to provide heat just occasionally?

MARK ALL THAT APPLY  
 (IF NONE, MARK "NO ADDITIONAL FUEL")

IF ONE OR MORE ADDITIONAL FUELS MENTIONED IN Q. 7, ASK:

8. Does your main heating fuel -- (FUEL NAMED IN Q. 6) -- provide almost all of the heat for your home, about three-fourths, or closer to half of the heat for your home?

- 1 [ ] ALMOST ALL (MORE THAN 95%)  
 2 [ ] ABOUT THREE-FOURTHS (67-94%)  
 3 [ ] CLOSER TO HALF (66% OR LESS)

144

### INTERVIEWER INSTRUCTIONS:

Q. 6 -- If two or more heating fuels are used, the main heating fuel is the one that provides most of the heat for the home.

Q. 6-7 -- If household recently converted to a different fuel, or is in the process of conversion, mark answer for fuel(s) in use during January of 1987.

9. In November of 1984 was the main fuel used to heat this (house/apartment) the same as it is now?

- YES -- SKIP TO Q. 12 145
- NO -- ASK Q. 10
- NO FUEL USED IN 1984--SKIP TO Q. 12
- DON'T KNOW -- SKIP TO Q. 12

IF "NO," ASK:

10. What was the main fuel used to heat this (house/apartment) in November of 1984?

- GAS FROM UNDERGROUND PIPES SERVING THE NEIGHBORHOOD
- LPG GAS (BOTTLED OR TANK GAS)
- FUEL OIL
- KEROSENE OR COAL OIL
- ELECTRICITY 146-
- COAL OR COKE 147
- WOOD
- SOLAR COLLECTORS
- OTHER (SPECIFY): \_\_\_\_\_

- NO FUEL USED
- DON'T KNOW

11. In what month and year was the main heating fuel changed?

MONTH: \_\_\_\_\_ 148-149  
YEAR: 198 \_\_\_\_\_ 150-151

TURN TO EXHIBIT 12/13

| 12. What is the main heating equipment used with your main heating fuel?                       | Q.12<br>MAIN<br>EQUIPMENT<br>(MARK<br>ONLY ONE) | Q. 13<br>MARK<br>ALL THAT<br>APPLY | 152-<br>153 |
|--|---|------------------------------------|-------------|
| HOT WATER PIPES RUNNING THROUGH A SLAB FLOOR (RADIANT HEATING) . . .                           | 01 [ ]  | [ ]                                | 154         |
| STEAM OR HOT WATER SYSTEM WITH RADIATORS OR CONVECTORS . . . . .                               | 02 [ ]  | [ ]                                | 155         |
| CENTRAL WARM-AIR FURNACE WITH DUCTS TO INDIVIDUAL ROOMS (DO NOT COUNT HEAT PUMP HERE). . . . . | 03 [ ]  | [ ]                                | 156         |
| HEAT PUMP. . . . .   | 04 [ ]  | [ ]                                | 157         |
| BUILT-IN ELECTRIC UNITS (PERMANENTLY INSTALLED IN WALL, CEILING, OR BASEBOARD). . . . .        | 05 [ ]  | [ ]                                | 158         |
| FLOOR, WALL, OR PIPELESS FURNACE . . . . .   | 06 [ ]  | [ ]                                | 159         |
| ROOM HEATER BURNING GAS, OIL, KEROSENE (NOT PORTABLE). . . . .                                 | 07 [ ]  | [ ]                                | 160         |
| HEATING STOVE BURNING WOOD, COAL, COKE . . . . .   | 08 [ ]  | [ ]                                | 161         |
| FIREPLACE(S) . . . . .   | 09 [ ]  | [ ]                                | 162         |
| PORTABLE ELECTRIC HEATER(S). . . . .   | 10 [ ]  | [ ]                                | 163         |
| PORTABLE KEROSENE HEATER(S). . . . .   | 11 [ ]  | [ ]                                | 164         |
| COOKING STOVE, RANGE, OR OVEN (USED TO HEAT HOME, AS WELL AS FOR COOKING) . . . . .            | 12 [ ]  | [ ]                                | 165         |
| OTHER (SPECIFY): _____   | 21 [ ]  | [ ]                                | 166         |
| DON'T KNOW . . . . .   | 96 [ ]  | [ ]                                | 167         |
| NO ADDITIONAL EQUIPMENT . . . . .  |   | [ ]                                | 168         |

13. What other types of equipment, if any, are used to heat your home -- including those that are used to provide heat just occasionally? MARK ALL THAT APPLY  
 (IF NONE, MARK "NO ADDITIONAL EQUIPMENT".)

TAKE BACK EXHIBIT 12/13

## IF "CENTRAL WARM-AIR FURNACE" MENTIONED IN Q. 12 OR Q. 13, ASK:

- |  |                  |     |
|--|------------------|-----|
| 14. For the central warm-air furnace, is the warm air forced through the ducts by a fan? | 1 [ ] YES        | 169 |
|  | 0 [ ] NO         |     |
|  | 6 [ ] DON'T KNOW |     |

## IF "HEATING STOVE BURNING WOOD, COAL, COKE" MENTIONED IN Q. 12 OR Q. 13, ASK:

- |                                    |                  |     |
|------------------------------------|------------------|-----|
| 15. Is the heating stove airtight? | 1 [ ] YES        | 170 |
|                                    | 0 [ ] NO         |     |
|                                    | 6 [ ] DON'T KNOW |     |

## IF SINGLE FAMILY HOME OR MOBILE HOME, ASK Q. 16. OTHERWISE SKIP TO Q. 17

- |   |                             |                             |     |
|---|-----------------------------|-----------------------------|-----|
| 16. How old is your main heating equipment, just approximately?<br>(INTERVIEWER: PROBE FOR BEST GUESS.) | 1 [ ] LESS THAN 2 YEARS OLD | 4 [ ] 10-14 YEARS OLD       | 171 |
|   | 2 [ ] 2-4 YEARS OLD         | 5 [ ] 15 YEARS OLD OR OLDER |     |
|   | 3 [ ] 5-9 YEARS OLD         | 6 [ ] DON'T KNOW            |     |

## IF 2 OR MORE HOUSING UNITS IN BUILDING, ASK Q. 17. OTHERWISE SKIP TO Q. 18

- |   |  |     |
|---|--|-----|
| 17. Does the main equipment for heating your home also heat one or more other apartments, households or businesses? | 0 [ ] NO, HOME HEATING EQUIPMENT IS FOR RESPONDENT'S HOME ONLY                               | 172 |
|   | 1 [ ] YES, HOME HEATING EQUIPMENT IS FOR ONE OR MORE OTHER APARTMENTS, HOUSES, OR BUSINESSES |     |
|   | 6 [ ] DON'T KNOW   |     |

18. At what temperature do you usually keep your home during the day in the wintertime when someone is at home? (SEE INSTRUCTION BELOW.)

DEGREES FAHRENHEIT:  173-  
174

HEAT TURNED OFF

19. At what temperature do you usually keep your home during the day in the wintertime when no one is at home? (SEE INSTRUCTION BELOW.)

DEGREES FAHRENHEIT:  175-  
176

HEAT TURNED OFF

20. At what temperature do you usually keep your home during sleeping hours in the wintertime? (SEE INSTRUCTION BELOW.)

DEGREES FAHRENHEIT:  177-  
178

HEAT TURNED OFF

#### HAND RESPONDENT EXHIBIT 21

21. Please look at this list and tell me the ways, if any, you use to adjust the temperature in your home during the heating season. (MARK ALL THAT APPLY.)

207-208:02

|  |                          |     |
|--|--------------------------|-----|
| THERMOSTAT FOR MAIN HEATING EQUIPMENT . . . . .                | <input type="checkbox"/> | 211 |
| THERMOSTAT FOR SUPPLEMENTAL HEATING EQUIPMENT . .              | <input type="checkbox"/> | 212 |
| OPENING AND CLOSING WINDOWS OR DOORS . . . . .                 | <input type="checkbox"/> | 213 |
| OPENING AND CLOSING HOT AIR VENTS . . . . .                    | <input type="checkbox"/> | 214 |
| TURN HEATER ON OR OFF (UP OR DOWN) . . . . .                   | <input type="checkbox"/> | 215 |
| TURN RADIATORS OR CONVECTORS ON OR OFF . . . . .               | <input type="checkbox"/> | 216 |
| ADJUST DRAFT OR AMOUNT OF FUEL FOR WOOD OR COAL FIRE . . . . . | <input type="checkbox"/> | 217 |
| USE COOKING STOVE, OVEN, OR RANGE TO HEAT HOME . . . . .       | <input type="checkbox"/> | 218 |
| OTHER (SPECIFY): _____   | <input type="checkbox"/> | 219 |
| NO WAY TO ADJUST THE TEMPERATURE . . . . .                     | <input type="checkbox"/> | 220 |

#### INTERVIEWER INSTRUCTIONS:

Q. 18-20 -- If respondent keeps different sections of the house at different temperatures, we want to know the temperature in the part of the house where the people are. If, for example, the heat is turned off upstairs during the day because the family is downstairs, we want the downstairs temperature.

If the respondent doesn't know temperature, but does know thermostat setting, record thermostat setting. Otherwise, probe for best estimate.

TURN TO EXHIBIT 22/25

22. During the last winter -- from October 1986 to April 1987 -- was there any period of 2 hours or more when you wanted to use your main source of heat but could not use it for any of these reasons?

(INTERVIEWER: READ AND MARK "YES" OR "NO" FOR EACH ITEM. SEE INSTRUCTION BELOW IF RESPONDENT REPORTS LIVING AT ANOTHER ADDRESS DURING ALL OR PART OF THE OCTOBER 1986 TO APRIL 1987 PERIOD.)

- 22a. A utility company shut off either your heating fuel or electricity needed to run your heating system . . . . . 1 [ ] YES 0 [ ] NO -- GO TO Q. 23a 221

IF "YES," ON Q. 22a, ASK:

- 22b. Was this because you forgot to pay, you could not pay, or was there some other reason? (CHOOSE MOST IMPORTANT REASON IF MORE THAN ONE APPLIES.) 1 [ ] FORGOT TO PAY 2 [ ] COULD NOT PAY 5 [ ] OTHER: (SPECIFY): \_\_\_\_\_ 222

- 22c. Thinking of all the times you were without heat because your fuel or electricity was shut off, altogether about how many hours or days were you without heat? [ ] HOURS \_\_\_\_\_ OR [ ] DAYS \_\_\_\_\_ 223-225

- 23a. You ran out of coal, wood, fuel oil or other bulk fuel . . . . . 1 [ ] YES 0 [ ] NO -- GO TO Q. 24a 226

IF "YES," ON Q. 23a, ASK:

- 23b. Was this because you forgot to pay for or order fuel, because you could not pay for the fuel, or was there some other reason? (CHOOSE MOST IMPORTANT REASON IF MORE THAN ONE APPLIES.) 1 [ ] FORGOT TO PAY 2 [ ] COULD NOT PAY 5 [ ] OTHER: (SPECIFY): \_\_\_\_\_ 227

- 23c. Thinking of all the times you were without heat because you ran out of coal, fuel oil, or other bulk fuel, altogether about how many hours or days were you without heat? [ ] HOURS \_\_\_\_\_ OR [ ] DAYS \_\_\_\_\_ 228-230

- 24a. Your landlord did not provide heat . . . . . 1 [ ] YES 0 [ ] NO -- GO TO Q. 25a 231

IF "YES," ON Q. 24a, ASK:

- 24b. Did the landlord fail to provide heat because you forgot to pay the rent, because you could not pay the rent, or was there some other reason? (CHOOSE MOST IMPORTANT REASON IF MORE THAN ONE APPLIES.) 1 [ ] FORGOT TO PAY 2 [ ] COULD NOT PAY 5 [ ] OTHER: (SPECIFY): \_\_\_\_\_ 232

- 24c. Thinking of all the times you were without heat because the landlord did not provide heat, altogether about how many hours or days were you without heat? [ ] HOURS \_\_\_\_\_ OR [ ] DAYS \_\_\_\_\_ 233-235

- 25a. Your heating system was broken . . . . . 1 [ ] YES 0 [ ] NO -- GO TO Q. 26a. 236

IF "YES," ON Q. 25a, ASK:

- 25b. Did you have to delay repairing or replacing your heating system because you could not pay for the repair or replacement? . . . . . 1 [ ] YES 0 [ ] NO 237

- 25c. Thinking of all the times you were without heat because your heating system was broken, altogether about how many hours or days were you without heat? [ ] HOURS \_\_\_\_\_ OR [ ] DAYS \_\_\_\_\_ 238-240

### INTERVIEWER INSTRUCTIONS:

All questions on this page -- Assure the respondent that these questions apply to all permanent residences of the household from October 1986 to April 1987.

IF "YES" TO 22a OR 23a OR 24a OR 25a, ASK:

- 26a. How many different times were you without your main source of heat during the last winter -- from October 1986 to April 1987? TIMES WITHOUT  
MAIN SOURCE  
OF HEAT: \_\_\_\_\_241-  
242
- 26b. During the time your home was without your main source of heat, were you able to heat your home in some other way? 1 [ ] YES  
2 [ ] NO -- SKIP TO Q. 27  
5 [ ] OTHER (SPECIFY: \_\_\_\_\_)243

IF "YES" OR "OTHER" TO 26b, ASK:

- 26c. How were you able to heat your home? (INTERVIEWER. WRITE DOWN WHATEVER RESPONDENT REPORTS.) 244-245  
246-247

27. Has any wood been burned in your home in the past 12 months? 1 [ ] YES  
0 [ ] NO -- SKIP TO Q. 32248

- IF "YES" HAND RESPONDENT EXHIBIT 28, AND ASK:  
28. This exhibit illustrates about one cord of wood. Did your household burn less than this amount, or about this amount or more? 1 [ ] LESS THAN ONE CORD -- ASK Q. 29  
2 [ ] ONE CORD OR MORE -- SKIP TO Q. 30249

- IF "LESS THAN ONE CORD," ON Q. 28, TURN TO EXHIBIT 29 AND ASK: 250

29. Which of these is most nearly the amount of wood burned in your household in the past 12 months? 1 [ ] A FEW LOGS OR SCRAPS OF WOOD  
2 [ ] 1/4 TO 1/3 OF A CORD  
3 [ ] 1/2 CORD (ABOUT ONE PICK-UP TRUCK OF WOOD)  
4 [ ] OVER 1/2 CORD BUT LESS THAN A FULL CORD

TAKE BACK EXHIBIT 29; SKIP TO Q. 31IF "ONE CORD OR MORE" ON Q. 28, TURN TO EXHIBIT 30 AND ASK:

30. This exhibit shows wood piles of different sizes. Just using these as general reference points, about how many cords of wood did you burn in your household in the past 12 months? (SEE INSTRUCTION BELOW.) NUMBER OF CORDS: \_\_\_\_\_251-  
253

TAKE BACK EXHIBIT 30; ASK Q. 31

31. Did you purchase any wood to burn in your home in the last 12 months? 1 [ ] YES  
0 [ ] NO254

**INTERVIEWER INSTRUCTIONS:**

- Q. 30 -- Exhibit 30 is intended only for general reference. Probe for respondent's best estimate of number of cords burned -- this, of course, will ordinarily be a number different from the specific quantities shown on the exhibit. Record answer to nearest cord, or cord plus fraction, as given by respondent (for example: 1, 1-1/2, 4, 10, 12, and so on).

HAND RESPONDENT EXHIBIT 32/34

32. Which fuel is used most for heating water (other than just for cooking purposes)?

- 01 GAS FROM UNDERGROUND PIPES SERVING THE NEIGHBORHOOD
- 02 LPG GAS (BOTTLED OR TANK GAS)
- 03 FUEL OIL
- 04 KEROSENE OR COAL OIL
- 05 ELECTRICITY 255-
- 06 COAL OR COKE 256
- 07 WOOD
- 08 SOLAR COLLECTORS
- 21 OTHER (SPECIFY): \_\_\_\_\_

00 NO FUEL USED -- TAKE BACK EXHIBIT  
32/34 SKIP TO Q. 38

96 DON'T KNOW

33. In addition to your main fuel, do you use any other fuel for heating water (other than just for cooking purposes)?

- 1 YES
  - 0 NO -- TAKE BACK EXHIBIT 32/34 257
- SKIP TO Q. 35

IF "YES," ASK:

34. What is the additional fuel?

- 01 GAS FROM UNDERGROUND PIPES SERVING THE NEIGHBORHOOD
- 02 LPG GAS (BOTTLED OR TANK GAS)
- 03 FUEL OIL
- 04 KEROSENE OR COAL OIL 258-
- 05 ELECTRICITY 259
- 06 COAL OR COKE
- 07 WOOD
- 08 SOLAR COLLECTORS
- 21 OTHER (SPECIFY): \_\_\_\_\_

96 DON'T KNOW

TAKE BACK EXHIBIT 32/34

35. Do you have hot running water in your home?

- 1 YES
- 0 NO 260

**IF ONE-FAMILY HOUSE OR MOBILE HOME, ASK:**

**36. About how old is your water heater, just approximately? (INTERVIEWER: PROBE FOR BEST GUESS.)**

- 1 [ ] LESS THAN 2 YEARS
- 2 [ ] 2 - 4 YEARS
- 3 [ ] 5 - 9 YEARS
- 4 [ ] 10 - 14 YEARS
- 5 [ ] 15 YEARS OR MORE
- 6 [ ] DON'T KNOW
- 0 [ ] DO NOT HAVE A HOT WATER HEATER

261

**IF 2 OR MORE UNITS IN BUILDING, ASK Q. 37.  
OTHERWISE SKIP TO Q. 38.**

262

**37. Does the equipment for heating water for your home also heat water for one or more other apartments, houses, or businesses?**

- 0 [ ] NO, HOT WATER EQUIPMENT IS FOR RESPONDENT'S HOME ONLY
- 1 [ ] YES, HOT WATER EQUIPMENT HEATS WATER FOR ONE OR MORE OTHER APARTMENTS, HOUSES, OR BUSINESSES
- 6 [ ] DON'T KNOW

38. Do you have air-conditioning equipment, either a central system or individual window or wall units? (MARK ALL THAT APPLY.)

YES, CENTRAL SYSTEM 263

YES, INDIVIDUAL (WINDOW/WALL) UNITS 264

NO -- SKIP TO Q. 45

IF "INDIVIDUAL (WINDOW/WALL) UNITS" ON Q. 38, ASK:

39. How many individual window or wall units do you have?

NUMBER OF UNITS:  265-  
266

IF "CENTRAL SYSTEM" ON Q. 38, ASK:

40. Does the central air-conditioning system use electricity, gas from underground pipes, or LPG?

ELECTRICITY 267

GAS FROM UNDERGROUND PIPES SERVING THE NEIGHBORHOOD

LPG GAS (BOTTLED OR TANK GAS)

DON'T KNOW

IF 2 OR MORE HOUSING UNITS IN BUILDING, ASK Q. 41, OTHERWISE SKIP TO Q. 42

41. Does the air-conditioning equipment that cools your home also cool other apartments, houses, or businesses?

NO, A/C IS FOR RESPONDENT'S HOME ONLY

YES, A/C COOLS ONE OR MORE OTHER APARTMENTS, HOUSES, OR BUSINESSES

DON'T KNOW 268

42. How many rooms in your (house/apartment) can be cooled by your air conditioning? Do not count bathrooms, hallways, foyers, or enclosed porches.

NUMBER OF ROOMS:  269-

270

95  ENTIRE HOUSE OR APARTMENT

HAND RESPONDENT EXHIBIT 43

43. Which of the statements on this exhibit best describes the way you used your air conditioner(s) last summer? (MARK ONLY ONE.)

DID NOT USE AT ALL 271

TURNED ON ONLY A FEW DAYS OR NIGHTS WHEN REALLY NEEDED

TURNED ON QUITE A BIT

TURNED ON JUST ABOUT ALL SUMMER

OTHER (SPECIFY): \_\_\_\_\_

TAKE BACK EXHIBIT 43

44. When you are using your air conditioning, about what temperature do you usually keep the cooled area? (SEE INSTRUCTION BELOW.)

DEGREES FAHRENHEIT:  272-  
273

**INTERVIEWER INSTRUCTIONS:**

Q. 44 -- If respondent keeps different sections of the house at different temperatures, we want to know the temperature in the part of the house where the people are. If, for example, the air conditioning is turned off upstairs during the day because the family is downstairs, we want the downstairs temperature.

If the respondent doesn't know temperature, but does know thermostat setting, record thermostat setting. Otherwise, probe for best estimate.

307-308:03

45. How many doors do you have in your home that go from a heated area to the outside or to an unheated area? (SEE INSTRUCTION BELOW.)

NUMBER  
OF DOORS:

311-312

NONE -- SKIP TO Q. 50

HAND RESPONDENT EXHIBIT 46

46. Please look at this exhibit of different kinds of doors. How many of each of these types of doors do you have?

| Q. 46<br>NUMBER<br>OF DOORS   | Q. 47<br>NUMBER WITH<br>STORM DOOR<br>OR INSULATING<br>GLASS | Q. 48<br>NUMBER OF STORM/<br>INSULATING DOORS<br>PUT IN SINCE<br>SEPT. 1, 1985 | Q. 49  |
|---|--|--|--|
| a. Sliding glass<br>doors<br><br><input type="checkbox"/> NONE 313        | <input type="checkbox"/> NONE 314                            | <input type="checkbox"/> NONE 315  | MONTH: _____<br>YEAR: 198 _____<br><br><input type="checkbox"/> IN PROCESS 316-319 |
| b. Other doors<br>to the outside<br><br><input type="checkbox"/> NONE 320 | <input type="checkbox"/> NONE 321                            | <input type="checkbox"/> NONE 322  | MONTH: _____<br>YEAR: 198 _____<br><br><input type="checkbox"/> IN PROCESS 323-326 |

TAKE BACK EXHIBIT 46

FOR EACH TYPE OF DOOR FOR WHICH  
ANSWER IS "ONE OR MORE," ASK:

47. (Does/How many of) the  
door(s) have (a storm door/  
storm doors) or insulating glass?

FOR EACH TYPE OF STORM DOOR OR DOOR WITH INSULATING  
GLASS, ASK:

48. How many of the (storm/insulated glass)  
doors were put in your home since  
September 1, 1985?

IF ONE OR MORE, ASK:

49. In what month and year (was it/were they) installed?

**INTERVIEWER INSTRUCTIONS:**

Q. 45-46 -- Count each pair of sliding glass doors as one door. Include doors that go to an unheated porch or garage. Do not include doors to a heated hallway in an apartment building, doors that are permanently sealed shut, or doors to an unheated attic or basement.

Q. 48 -- Count as "In Process" any work started but not yet completed. Do not count work done before this household moved in.

50. How many windows do you have in your home? Please include basement, attic, garage, and porch windows only if these areas are heated. (SEE INSTRUCTION BELOW.)

|                               |  |   |   |
|-------------------------------|--|---|---|
| Q. 50<br>NUMBER<br>OF WINDOWS | Q. 51<br>NUMBER WITH<br>STORM<br>WINDOWS OR<br>INSULATING<br>GLASS | Q. 52<br>NUMBER STORM<br>WINDOWS<br>PUT IN SINCE<br>SEPT. 1, 1985 | Q. 53   |
| _____                         | _____  | _____   | MONTH: _____<br>YEAR: 198_____<br>[ ] IN PROCESS<br>333-336 |

[ ] NONE 327-328      [ ] NONE 329-330      [ ] NONE 331-332

51. How many of the windows have storm windows or insulating glass? (SEE INSTRUCTION BELOW.)

IF ONE OR MORE WINDOWS WITH STORM WINDOWS OR INSULATING GLASS, ASK:

52. How many of the storm windows or windows with insulating glass were put in your home since September 1, 1985?

IF ONE OR MORE ASK:

53. In what month and year were they put in? \_\_\_\_\_

IF THE NUMBER OF WINDOWS IN Q. 50 IS GREATER THAN THE NUMBER OF WINDOWS WITH STORM WINDOWS OR INSULATING GLASS IN Q. 51, ASK:

54. You have mentioned that one or more of your windows does not have a storm window or insulating glass. For any of these windows without storm windows or insulating glass, do you use insulating drapes, plastic sheets or other protection?

337

[ ] YES

[ ] NO -- SKIP TO Q. 56

IF "YES," ASK:

55. Thinking now only of your windows without storm windows or insulating glass, about how many windows have insulating drapes, plastic sheets or other protection?

NUMBER WITH  
PROTECTION: \_\_\_\_\_

338-339

### INTERVIEWER INSTRUCTIONS:

Q. 50 -- Each window that opens separately should be counted as one window. Also count windows that are fixed in place. Do not include windows (glass panels) in doors.

Q. 51 -- Windows made of double glass and other types of insulating glass count the same as storm windows.

Q. 52 -- Count as "In Process" any work started but not yet completed. Do not count work done before this household moved in.

IF ONE-FAMILY HOUSE OR MOBILE HOME, ASK Q. 56ff. IF 2 OR MORE UNITS IN BUILDING, SKIP TO Q. 86 ON PAGE 18.

56. Do you have roof or ceiling insulation in your home?  YES  
 NO -- SKIP TO Q. 62      340  
 DON'T KNOW -- SKIP TO Q. 62

IF "YES," HAND RESPONDENT EXHIBIT 57 AND ASK:

57. About how much of the roof or ceiling area is insulated?  VERY LITTLE (LESS THAN 5%)  
 1/4 (5 - 33%)  
 1/2 (34 - 66%)      341  
 3/4 (67 - 95%)  
 ALL (96 - 100%)

TURN TO EXHIBIT 58

58. This exhibit shows different kinds of insulation. Please tell me whether or not you have each one in your roof or ceiling area.

|                                  |   |  |
|----------------------------------|---|--|
| a. BATT/BLANKET                  | <input type="checkbox"/> YES<br><input type="checkbox"/> NO<br><input type="checkbox"/> DON'T KNOW<br><br>342 | INCHES<br><input type="checkbox"/> DON'T KNOW<br><br>343-344 |
| b. LOOSE PARTICLES/LOOSE FILL    | <input type="checkbox"/> YES<br><input type="checkbox"/> NO<br><input type="checkbox"/> DON'T KNOW<br><br>345 | INCHES<br><input type="checkbox"/> DON'T KNOW<br><br>346-347 |
| c. FIRM FOAM/FIRM PLASTIC        | <input type="checkbox"/> YES<br><input type="checkbox"/> NO<br><input type="checkbox"/> DON'T KNOW<br><br>348 | INCHES<br><input type="checkbox"/> DON'T KNOW<br><br>349-350 |
| d. SPRAYED-IN FOAM               | <input type="checkbox"/> YES<br><input type="checkbox"/> NO<br><input type="checkbox"/> DON'T KNOW<br><br>352 | INCHES<br><input type="checkbox"/> DON'T KNOW<br><br>352-353 |
| e. OTHER (SPECIFY):<br><br>_____ | <input type="checkbox"/> YES<br><input type="checkbox"/> NO<br><input type="checkbox"/> DON'T KNOW<br><br>354 | INCHES<br><input type="checkbox"/> DON'T KNOW<br><br>355-356 |

FOR EACH "YES," ASK:

59. About how many inches of (INSULATION TYPE) do you have in your roof or ceiling area? \_\_\_\_\_

TAKE BACK EXHIBIT 58

60. Was any of the roof or ceiling insulation added or installed in your home since September 1, 1985?

INTERVIEWER: COUNT AS "IN PROCESS" ANY WORK STARTED BUT NOT YET COMPLETED. DO NOT COUNT ANY CHANGES MADE BEFORE THIS HOUSEHOLD MOVED IN.  YES  
 NO -- SKIP TO Q. 62      357  
 IN PROCESS -- SKIP TO Q. 62

IF "YES," ASK:

61. In what month and year was the work completed? MONTH: \_\_\_\_\_  
YEAR: 198 \_\_\_\_\_      358-362  
 IN PROCESS

CONTINUE IF ONE-FAMILY HOUSE OR MOBILE HOME. IF 2 OR MORE UNITS IN BUILDING, SKIP TO Q. 86



IF "ALL" OR "SOME," ASK:



IF "YES," ASK:

64. In what month and year was the work completed?  
(SEE INSTRUCTION AT BOTTOM OF FACING PAGE.) MONTH: \_\_\_\_\_ 364-367  
YEAR: 198 \_\_\_\_\_  
[ ] IN PROCESS

HAND RESPONDENT EXHIBIT 65

65. Please look at this list and as I read each item, tell me which, if any, you have in your home:

|   | Q. 65<br>HAVE SOME IN HOME             | Q. 66<br>INSTALLED SINCE SEPTEMBER 1, 1985 | Q. 67<br>MONTH/YEAR INSTALLED               |
|---|--|--|---|
| a. Insulation in the basement or crawl space below the floor of your home | 1 [] YES<br>0 [] NO<br>6 [] DON'T KNOW | 1 [] YES<br>0 [] NO<br>2 [] IN PROCESS     | MONTH: _____<br>YEAR: 198<br>[ ] IN PROCESS |
|   |  | 368  | 369   |
| b. Insulation around heating and/or cooling ducts                         | 1 [] YES<br>0 [] NO<br>6 [] DON'T KNOW | 1 [] YES<br>0 [] NO<br>2 [] IN PROCESS     | MONTH: _____<br>YEAR: 198<br>[ ] IN PROCESS |
|   |  | 374  | 375   |
| c. Insulation around the hot water and/or cooling pipes                   | 1 [] YES<br>0 [] NO<br>6 [] DON'T KNOW | 1 [] YES<br>0 [] NO<br>2 [] IN PROCESS     | MONTH: _____<br>YEAR: 198<br>[ ] IN PROCESS |
|   |  | 411  | 412   |
| d. Insulation around the hot water heater                                 | 1 [] YES<br>0 [] NO<br>6 [] DON'T KNOW | 1 [] YES<br>0 [] NO<br>2 [] IN PROCESS     | MONTH: _____<br>YEAR: 198<br>[ ] IN PROCESS |
|   |  | 427  | 428   |
| e. Caulking   | 1 [] YES<br>0 [] NO<br>6 [] DON'T KNOW | 1 [] YES<br>0 [] NO<br>2 [] IN PROCESS     | MONTH: _____<br>YEAR: 198<br>[ ] IN PROCESS |
|   |  | 423  | 424   |
| f. Weather stripping around any windows or doors to the outside           | 1 [] YES<br>0 [] NO<br>6 [] DON'T KNOW | 1 [] YES<br>0 [] NO<br>2 [] IN PROCESS     | MONTH: _____<br>YEAR: 198<br>[ ] IN PROCESS |
|   |  | 429  | 430   |
|   |  |  | 431-434                                     |

FOR EACH "YES" ON Q. 65, ASK:

66. Was any of the -- (SPECIFIED ITEM) -- added or  
installed since September 1, 1985? \_\_\_\_\_  
(SEE INSTRUCTION AT BOTTOM OF FACING PAGE.)

IF "YES, ADDED OR INSTALLED SINCE SEPTEMBER 1, 1985", ASK:

67. In what month and year was the work completed  
(SEE INSTRUCTION AT BOTTOM OF FACING PAGE.)

CONTINUE IF ONE-FAMILY HOUSE OR MOBILE HOME. IF 2 OR MORE UNITS IN BUILDING, SKIP TO Q. 86

TURN TO EXHIBIT 68

68. Please look at this list and as I read each item tell me which, if any, have been added or installed in your home since September 1, 1985. (SEE INSTRUCTION AT BOTTOM OF PAGE.)

|  | Q. 68                                     | Q. 69   |
|--|---|---|
| a. An automatic set-back or clock thermostat                         | 1 [ ] YES<br>0 [ ] NO<br>2 [ ] IN PROCESS | MONTH: _____<br>YEAR: 198_____<br>[ ] IN PROCESS<br>435 436-439 |
| b. Flame retention head burner for furnace (fuel oil)                | 1 [ ] YES<br>0 [ ] NO<br>2 [ ] IN PROCESS | MONTH: _____<br>YEAR: 198_____<br>[ ] IN PROCESS<br>440 441-444 |
| c. Automatic flue door (vent damper)                                 | 1 [ ] YES<br>0 [ ] NO<br>2 [ ] IN PROCESS | MONTH: _____<br>YEAR: 198_____<br>[ ] IN PROCESS<br>445 446-449 |
| d. Electrical or mechanical furnace ignition system (spark ignition) | 1 [ ] YES<br>0 [ ] NO<br>2 [ ] IN PROCESS | MONTH: _____<br>YEAR: 198_____<br>[ ] IN PROCESS<br>450 451-454 |
| e. Closeable shutters, insulating drapes, reflective film            | 1 [ ] YES<br>0 [ ] NO<br>2 [ ] IN PROCESS | MONTH: _____<br>YEAR: 198_____<br>[ ] IN PROCESS<br>455 456-459 |
| f. Plastic sheets (over windows or other openings)                   | 1 [ ] YES<br>0 [ ] NO<br>2 [ ] IN PROCESS | MONTH: _____<br>YEAR: 198_____<br>[ ] IN PROCESS<br>460 461-464 |
| g. Heat pump   | 1 [ ] YES<br>0 [ ] NO<br>2 [ ] IN PROCESS | MONTH: _____<br>YEAR: 198_____<br>[ ] IN PROCESS<br>465 466-469 |
| h. Wood-burning stove  | 1 [ ] YES<br>0 [ ] NO<br>2 [ ] IN PROCESS | MONTH: _____<br>YEAR: 198_____<br>[ ] IN PROCESS<br>470 471-474 |

FOR EACH "YES," ASK:

69. In what month and year was the work completed?  
(SEE INSTRUCTION BELOW.)

TAKE BACK EXHIBIT 68

**INTERVIEWER INSTRUCTIONS:**

Was item added or installed since September 1, 1985 (Q. 63,66,68) -- Mark "Yes," "No," or "In Process" for each item. Count as "In Process" any work started but not yet completed. Do not count any changes made before this household moved in.

Month/year installed (Q. 64,67,69) -- If household has done item more than once, write down the most recent date.

507-  
508:05

**CONTINUE IF ONE-FAMILY HOUSE OR MOBILE HOME. IF 2 OR MORE UNITS IN BUILDING, SKIP TO Q.86**

511-513

70. Do you have a heated swimming pool, hot tub or jacuzzi? (DO NOT COUNT A CHILDREN'S WADING POOL AS A SWIMMING POOL.)
- |                      |                              |                             |
|----------------------|------------------------------|-----------------------------|
| HEATED SWIMMING POOL | <input type="checkbox"/> YES | <input type="checkbox"/> NO |
| HOT TUB              | <input type="checkbox"/> YES | <input type="checkbox"/> NO |
| JACUZZI              | <input type="checkbox"/> YES | <input type="checkbox"/> NO |

IF "YES" ON HEATED SWIMMING POOL, HOT TUB  
OR JACUZZI, ASK:

HAND RESPONDENT EXHIBIT 71

71. What fuel is used to heat the water?  
(IF MORE THAN ONE FUEL IS USED, CHECK  
FUEL USED MOST.)

- 01[] GAS FROM UNDERGROUND PIPES  
 SERVING THE NEIGHBORHOOD  
 02[] LPG GAS (BOTTLED OR TANK GAS)  
 03[] FUEL OIL  
 04[] KEROSENE OR COAL OIL  
 05[] ELECTRICITY                            514-  
 06[] COAL OR COKE                            515  
 07[] WOOD  
 08[] SOLAR COLLECTORS  
 21[] OTHER (SPECIFY): \_\_\_\_\_

96[] DON'T KNOW

TAKE BACK EXHIBIT 71

INTERVIEWER:

THIS IS A BLANK PAGE.

THERE ARE NO QUESTIONS 72-85.

GO TO NEXT PAGE.

These next questions are about household appliances.

86. Do you have a refrigerator in your home that you use regularly or occasionally?  YES  
 NO -- SKIP TO Q. 89

657

IF "YES," ASK:

87. Do you have one refrigerator or more than one that is presently in use? (How many altogether?)  
 ONE  
 TWO  
 THREE OR MORE

658

ASK ABOUT EACH REFRIGERATOR -- FIRST ASK ABOUT REFRIGERATOR USED MOST: (SEE INSTRUCTION BELOW.)

HAND RESPONDENT EXHIBIT 88

88. Which of these best describes your refrigerator? (MARK ONE)
- Freezer section (or ice cube section) must be defrosted periodically
  - Freezer section defrosts automatically after frost builds up (catch pan must be emptied)
  - Full frost-free (frost does not build up)
  - No working freezer section

| REFRIGERATOR #1 | REFRIGERATOR #2 |
|-----------------|-----------------|
|                 | 660             |
| 1 [ ]           | 1 [ ]           |
| 2 [ ]           | 2 [ ]           |
| 3 [ ]           | 3 [ ]           |
| 4 [ ]           | 4 [ ]           |

TAKE BACK EXHIBIT 88

**INTERVIEWER INSTRUCTIONS:**

Q. 88-- If respondent has more than two refrigerators, ask about two used most.

AND RESPONDENT EXHIBIT 89

89. Thinking of all the different kinds of cooking done here, including cooking in the oven, on a range, and with small appliances, which fuel is used most?

- |   |      |
|---|------|
| 01 [ ] GAS FROM UNDERGROUND PIPES       | 663  |
| 02 [ ] SERVING THE NEIGHBORHOOD         |      |
| 03 [ ] LPG GAS (BOTTLED OR TANK GAS)    |      |
| 04 [ ] FUEL OIL                         |      |
| 05 [ ] KEROSENE OR COAL OIL             | 661- |
| 06 [ ] ELECTRICITY                      | 662  |
| 07 [ ] COAL OR COKE                     |      |
| 08 [ ] WOOD                             |      |
| 21 [ ] OTHER (SPECIFY): _____           |      |
| 00 [ ] NO COOKING DONE -- SKIP TO Q. 91 |      |

TURN TO EXHIBIT 90

90. Which of these are used for cooking here in your (house/apartment)?

- |   |           |          |     |
|---|-----------|----------|-----|
| ELECTRIC STOVE-TOP OR ELECTRIC BURNERS                  | 1 [ ] YES | 0 [ ] NO | 663 |
| GAS STOVE-TOP OR GAS BURNERS                            | 1 [ ] YES | 0 [ ] NO | 664 |
| MICROWAVE OVEN  | 1 [ ] YES | 0 [ ] NO | 665 |
| ELECTRIC OVEN OTHER THAN MICROWAVE                      | 1 [ ] YES | 0 [ ] NO | 666 |
| GAS OVEN  | 1 [ ] YES | 0 [ ] NO | 667 |
| OUTDOOR GAS GRILL<br>(USING GAS FROM UNDERGROUND PIPES) | 1 [ ] YES | 0 [ ] NO | 668 |
| OUTDOOR GAS GRILL<br>(USING LPG-BOTTLED OR TANK GAS)    | 1 [ ] YES | 0 [ ] NO | 669 |

TURN TO EXHIBIT 91

91. Please look at this list and, as I read each item, tell me which of these you use here in your (house/apartment)? (INTERVIEWER: READ AND MARK "YES" or "NO" FOR EACH ITEM).

|  |   |                             |   |
|--|---|-----------------------------|---|
| AUTOMATIC CLOTHES WASHER   | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO | 670   |
| WRINGER WASHING MACHINE (ELECTRIC)                               | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO | 671   |
| ELECTRIC DISHWASHER  | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO | 672   |
| ELECTRIC CLOTHES DRYER   | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO | 673   |
| GAS CLOTHES DRYER  | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO | 674   |
| OUTDOOR GAS LIGHT  | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO | 675   |
| ELECTRIC DEHUMIDIFIER  | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO | 676   |
| ELECTRIC HUMIDIFIER  | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO | 677   |
| EVAPORATIVE COOLER (SWAMP COOLER)                                | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO | 678   |
| "WHOLE HOUSE" COOLING FAN<br>(IN ATTIC OR ENTRANCE TO ATTIC)     | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO | 679   |
| WINDOW OR CEILING FAN  | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO | 680   |
| ELECTRIC BLANKET   | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO | 707-708+07<br>711   |
| WATER BED WITH HEATER  | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO | 712   |
| FROST FREE FREEZER<br>(SEPARATE APPLIANCE FROM REFRIGERATOR)     | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO | 713   |
| MANUAL DEFROST FREEZER<br>(SEPARATE APPLIANCE FROM REFRIGERATOR) | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO | 714   |
| BLACK AND WHITE TELEVISION SET                                   | <input type="checkbox"/> YES            | <input type="checkbox"/> NO | NUMBER: <span style="border: 1px solid black; padding: 2px;"> </span> |
| COLOR TELEVISION SET   | <input type="checkbox"/> YES            | <input type="checkbox"/> NO | NUMBER: <span style="border: 1px solid black; padding: 2px;"> </span> |

IF "YES," FOR BLACK AND WHITE TV SET, ASK:

92. How many black and white television sets do you use here in your home? \_\_\_\_\_

IF "YES," FOR COLOR TV SET, ASK:

93. How many color television sets do you use here in your home? \_\_\_\_\_

TAKE BACK EXHIBIT 91. HAND RESPONDENT EXHIBIT 94.

94. Do you have any other kinds of equipment that use a lot of energy that we have not mentioned?  YES       NO

717

IF "YES" ON Q. 94, ASK:

95. Please describe the equipment and how you use it.

718-720

TAKE BACK EXHIBIT 94

96. Now I have some questions about the people who live here. Please tell me who they are, just in relation to (HOUSEHOLDER). I would also like to know their ages on their last birthdays. Please begin with (HOUSEHOLDER). (SEE INSTRUCTIONS BELOW.)

| PERSON NUMBER | WHO IS RESPON-DENT? | RELATIONSHIP TO HOUSEHOLDER | SEX    |      | AGE | Q. 101 - EMPLOYMENT (AGE 14+) |           |              |
|---------------|---------------------|-----------------------------|--------|------|-----|-------------------------------|-----------|--------------|
|               |                     |                             | FEMALE | MALE |     | FULL TIME                     | PART TIME | NOT EMPLOYED |
| 1             |                     | HOUSEHOLDER                 | 1[]    | 2[]  |     | 1[]                           | 2[]       | 0[]          |
| 2             |                     |                             | 1[]    | 2[]  |     | 1[]                           | 2[]       | 0[]          |
| 3             |                     |                             | 1[]    | 2[]  |     | 1[]                           | 2[]       | 0[]          |
| 4             |                     |                             | 1[]    | 2[]  |     | 1[]                           | 2[]       | 0[]          |
| 5             |                     |                             | 1[]    | 2[]  |     | 1[]                           | 2[]       | 0[]          |
| 6             |                     |                             | 1[]    | 2[]  |     | 1[]                           | 2[]       | 0[]          |
| 7             |                     |                             | 1[]    | 2[]  |     | 1[]                           | 2[]       | 0[]          |
| 8             |                     |                             | 1[]    | 2[]  |     | 1[]                           | 2[]       | 0[]          |
| 9             |                     |                             | 1[]    | 2[]  |     | 1[]                           | 2[]       | 0[]          |
| 10            |                     |                             | 1[]    | 2[]  |     | 1[]                           | 2[]       | 0[]          |
| 11            |                     |                             | 1[]    | 2[]  |     | 1[]                           | 2[]       | 0[]          |
| 12            |                     |                             | 1[]    | 2[]  |     | 1[]                           | 2[]       | 0[]          |

I have listed (READ RELATIONSHIPS FROM Q. 96 ABOVE). Have I missed . . . . .

↑ FOR OFFICE  
USE ONLY:

868-869

97. Any babies or small children?  YES (ADD TO LISTING)  
 NO
98. Any lodgers, boarders, or persons in your employ who live here?  YES (ADD TO LISTING)  
 NO
99. Anyone who usually lives here but is away traveling or in the hospital? (SEE INSTRUCTION BELOW.)  YES (ADD TO LISTING)  
 NO
100. Anyone else staying here who does not have a regular residence elsewhere?  YES (ADD TO LISTING)  
 NO

FOR EACH PERSON AGED 14 YEARS OR OLDER, ASK:

101. Is he/she employed full-time (30 hours or more per week), part-time, or not employed?

**INTERVIEWER INSTRUCTIONS:**

In general, the householder is the person (or one of the persons) in whose name the home is owned or rented.

For questions on this and the following pages, where the term "HOUSEHOLDER" is inserted, use the appropriate designation -- you, your husband, wife, partner -- depending on who is the householder and whom you are interviewing.

Q. 96 -- Be sure to list relationships, not names. Include members of a second family that share the housing unit. Check box to indicate which household member is the respondent.

Q. 99 -- Persons who are normally members of the household but who are now living away from home (e.g., college students or members of the Armed Forces) should not be listed.

102. Does another family share your home with you?       YES (SEE INSTRUCTION BELOW.)  
 NO      870

**INTERVIEWER: MARK ANSWER. ASK, IF NECESSARY.**

|   |  |  |     |
|---|--|--|-----|
| <b>HOUSEHOLDER'S<br/>MARITAL STATUS</b> | 103. Which of the following best describes (HOUSEHOLDER): now married, widowed, divorced or separated, or never married? | <input type="checkbox"/> NOW MARRIED           | 871 |
|   |  | <input type="checkbox"/> WIDOWED               |     |
|   |  | <input type="checkbox"/> DIVORCED OR SEPARATED |     |
|   |  | <input type="checkbox"/> NEVER MARRIED         |     |

**HAND RESPONDENT EXHIBIT 104**

104. Which of the groups on this exhibit best describes (HOUSEHOLDER)?       WHITE      872  
 BLACK OR NEGRO  
 AMERICAN INDIAN, ALASKAN NATIVE  
 ASIAN, PACIFIC ISLANDER  
 OTHER (SPECIFY): \_\_\_\_\_

**TAKE BACK EXHIBIT 104**

105. Is (HOUSEHOLDER) of Spanish or Hispanic origin or descent?       YES      873  
 NO

**INTERVIEWER INSTRUCTIONS:**

Q.102 -- If answer is "YES," check whether the additional family (or unrelated individual) has a separate room or apartment that is defined by our rules as separate living quarters. Separate living quarters are those in which the occupants (1) live and eat separately from other persons in building, and (2) have direct access from outside the building or through a common hall.

Separate living quarters should be listed separately on your housing unit address list for this location. See sampling instructions as to whether an additional interview should be completed.

If the second family's space does meet the rules for separate living quarters, that space should be excluded from the information obtained in this interview. Go back over this interview to make corrections if necessary.

If the second family's space does not meet the definition of separate living quarters, be sure that the members of the second family are included in the list of household members in Q. 96

I have just a few questions for background statistical purposes.

106. What is the highest grade (or year) (HOUSEHOLDER) attended in school?

- |  |                 |
|--|-----------------|
| 00 [ ] NEVER ATTENDED SCHOOL<br>SKIP TO Q. 108 |                 |
| 01 [ ] FIRST                                   | 07 [ ] SEVENTH  |
| 02 [ ] SECOND                                  | 08 [ ] EIGHTH   |
| 03 [ ] THIRD                                   | 09 [ ] NINTH    |
| 04 [ ] FOURTH                                  | 10 [ ] TENTH    |
| 05 [ ] FIFTH                                   | 11 [ ] ELEVENTH |
| 06 [ ] SIXTH                                   | 12 [ ] TWELFTH  |
- 874-  
875

COLLEGE (ACADEMIC YEARS)

- |           |                   |
|-----------|-------------------|
| 13 [ ] C1 | 16 [ ] C4         |
| 14 [ ] C2 | 17 [ ] C5         |
| 15 [ ] C3 | 18 [ ] C6 OR MORE |

107. Did (HOUSEHOLDER) finish that grade (or year)?

- |           |     |
|-----------|-----|
| 1 [ ] YES |     |
| 0 [ ] NO  | 876 |

HAND RESPONDENT EXHIBIT 108

108. In the past 12 months, did you or any member of your family living here receive any income or benefits from: (INTERVIEWER: READ AND MARK "YES" OR "NO" FOR EACH ITEM.)

907-908:09

- |  |           |          |     |
|--|-----------|----------|-----|
| a. Wages or salaries . . . . .                             | 1 [ ] YES | 0 [ ] NO | 911 |
| b. Self-employment from business or farm. . . . .          | 1 [ ] YES | 0 [ ] NO | 912 |
| c. Aid to Families with Dependent Children (AFDC). . . . . | 1 [ ] YES | 0 [ ] NO | 913 |
| d. Supplemental Security Income (SSI) . . . . .            | 1 [ ] YES | 0 [ ] NO | 914 |
| e. General Assistance or other public assistance . . . . . | 1 [ ] YES | 0 [ ] NO | 915 |
| f. Food Stamps. . . . .                                    | 1 [ ] YES | 0 [ ] NO | 916 |
| g. Social Security or Railroad Retirement . . . . .        | 1 [ ] YES | 0 [ ] NO | 917 |
| h. Unemployment compensation . . . . .                     | 1 [ ] YES | 0 [ ] NO | 918 |

TURN TO EXHIBIT 109

109. Now let's look at this list of income groups. Please tell me which group letter best describes the total combined income in the last 12 months of all members of your family living here, from all sources -- wages, dividends, Social Security, and so forth -- before taxes and deductions. (Family includes all related persons living in this household.)

CIRCLE LETTER FOR INCOME GROUP

919-920

|      |                     |      |                     |      |                     |
|------|---------------------|------|---------------------|------|---------------------|
| 01 A | LESS THAN \$ 3,000  | 10 I | \$11,000 - \$12,499 | 19 Q | \$27,500 - \$29,999 |
| 02 B | \$ 3,000 - \$ 3,999 | 12 J | \$12,500 - \$13,999 | 20 R | \$30,000 - \$32,499 |
| 03 C | \$ 4,000 - \$ 4,999 | 13 K | \$14,000 - \$14,999 | 21 S | \$32,500 - \$34,999 |
| 04 D | \$ 5,000 - \$ 5,999 | 14 L | \$15,000 - \$17,499 | 22 T | \$35,000 - \$39,999 |
| 05 E | \$ 6,000 - \$ 7,499 | 15 M | \$17,500 - \$19,999 | 23 U | \$40,000 - \$49,999 |
| 07 F | \$ 7,500 - \$ 8,999 | 16 N | \$20,000 - \$22,499 | 24 V | \$50,000 - \$74,999 |
| 08 G | \$ 9,000 - \$ 9,999 | 17 O | \$22,500 - \$24,999 | 25 W | \$75,000 OR OVER    |
| 09 H | \$10,000 - \$10,999 | 18 P | \$25,000 - \$27,499 |      |                     |

96 [ ] DON'T KNOW

97 [ ] REFUSED

TAKE BACK EXHIBIT 109

IF ANSWER TO Q. 109 IS GROUP R THROUGH W (INCOME \$30,000 OR OVER), SKIP TO Q. 115 ON PAGE 26.  
 IF ANSWER TO Q. 109 IS GROUP A THROUGH Q (INCOME UNDER \$30,000), "DON'T KNOW", OR "REFUSED", CONTINUE WITH Q. 110.

HAND RESPONDENT EXHIBIT 110

110. Between October 1, 1986, and September 30, 1987, did your household receive any of the following services free or at reduced cost from the federal, state, or local government? (INTERVIEWER: READ AND MARK "YES" OR "NO" FOR EACH ITEM.)

- a. Insulation in the attic, outside wall, or basement/crawl space below the floor of the house . . . . . 1 [ ] YES o [ ] NO 921
- b. Insulation around the hot water heater. . . . . 1 [ ] YES o [ ] NO 922
- c. Repair of broken windows or doors to keep out the cold or hot weather . . . . . 1 [ ] YES o [ ] NO 923
- d. Weather stripping or caulking around any windows or doors to the outside . . . . . 1 [ ] YES o [ ] NO 924
- e. Storm doors or windows added. . . . . 1 [ ] YES o [ ] NO 925
- f. Repair of broken furnace . . . . . 1 [ ] YES o [ ] NO 926
- g. Furnace tuneup and/or modifications . . . . . 1 [ ] YES o [ ] NO 927
- h. Other home energy-saving devices  
(Specify): \_\_\_\_\_ 1 [ ] YES o [ ] NO 928

TURN TO EXHIBIT 111

111. The government has a home energy assistance program that helps pay heating and cooling costs. This assistance can be received directly by the household or it can be paid directly to the electric or gas company or fuel dealer.

Between October 1, 1986 and September 30, 1987 did your household receive government energy assistance (either directly or through the utility company or fuel dealer) for any of the following: (INTERVIEWER: READ AND MARK "YES" OR "NO" FOR EACH ITEM).

- |  |                              |                             |     |
|--|------------------------------|-----------------------------|-----|
| 111a. Help in paying home <u>heating</u> costs . . . . .     | <input type="checkbox"/> YES | <input type="checkbox"/> NO | 929 |
| 111b. Help in paying home <u>cooling</u> costs . . . . .     | <input type="checkbox"/> YES | <input type="checkbox"/> NO | 930 |
| 111c. Help in paying <u>other</u> home energy costs. . . . . | <input type="checkbox"/> YES | <input type="checkbox"/> NO | 931 |

IF "YES" ON Q. 111c, ASK:

112. Please describe this other assistance.
- 

IF "YES" ON Q. 111a (ASSISTANCE TO HELP PAY HOME HEATING COSTS), TURN TO EXHIBIT 113 AND ASK:

113. Were heating assistance payments made in the form of checks, coupons, or vouchers sent to this household or were the payments sent directly to the utility company or fuel dealer? (INTERVIEWER: READ AND MARK "YES" OR "NO" FOR EACH ITEM).

- |   |                              |                             |     |
|---|------------------------------|-----------------------------|-----|
| a. Check to household . . . . .   | <input type="checkbox"/> YES | <input type="checkbox"/> NO | 932 |
| b. Coupon/voucher to household. . . . .   | <input type="checkbox"/> YES | <input type="checkbox"/> NO | 933 |
| c. Assistance sent directly to electric<br>or gas company, or fuel dealer . . . . . | <input type="checkbox"/> YES | <input type="checkbox"/> NO | 934 |

114. Altogether, how much government energy assistance to help pay heating costs has been provided directly to this household and/or provided on behalf of this household to a utility company or fuel dealer, between October 1, 1986 and September 30, 1987? (PROBE FOR BEST ESTIMATE).

NUMBER OF  
DOLLARS \$ \_\_\_\_\_ .00

935-938

TAKE BACK EXHIBITS

## ASK EVERYONE

115. Do you or members of your household own your home or do you rent?

- 1 [ ] OWN (BUYING) 939  
 2 [ ] RENT -- SKIP TO Q. 118  
 3 [ ] OCCUPIED WITHOUT PAYMENT OF RENT -- SKIP TO Q. 120

## IF "OWN (BUYING)," ASK:

116. Is this (house/apartment) part of a condominium or cooperative?

- 1 [ ] YES, CONDOMINIUM 940  
 2 [ ] YES, COOPERATIVE ] SKIP TO  
 0 [ ] NO ---- Q. 120

INTERVIEWER: THERE IS NO QUESTION 117

## IF "RENT," ASK:

118. Is this residence in a public housing project -- that is, is it owned by a local housing authority?

- 1 [ ] YES -- SKIP TO Q. 120 945  
 0 [ ] NO  
 6 [ ] DON'T KNOW

## IF "NO" OR "DON'T KNOW," ASK:

119. Are you paying lower rent because the federal, state, or local government is paying part of the cost?

- 1 [ ] YES 946  
 0 [ ] NO  
 6 [ ] DON'T KNOW

**HAND RESPONDENT EXHIBIT 120**

120. We may have covered some of these points before, but just to be sure, please look at this exhibit and tell me whether these fuels are used for these purposes in your household.

|   | <u>USED</u> | <u>NOT<br/>USED</u> | <u>PAID BY<br/>HOUSEHOLD</u> | <u>INCLUDED<br/>IN RENT</u> | <u>OTHER<br/>(SPECIFY)</u> |                  |
|---|-------------|---------------------|------------------------------|-----------------------------|----------------------------|------------------|
| <b>ELECTRICITY</b>  |             |                     |                              |                             |                            |                  |
| a. FOR HOT WATER  | 1 [ ]       | 0 [ ]               | 1 [ ]                        | 2 [ ]                       | 5 [ ]                      | 947-948          |
| b. FOR HEATING YOUR HOME  | 1 [ ]       | 0 [ ]               | 1 [ ]                        | 2 [ ]                       | 5 [ ]                      | 949-950          |
| c. FOR AIR-CONDITIONING (CENTRAL OR<br>WINDOW/WALL UNITS)       | 1 [ ]       | 0 [ ]               | 1 [ ]                        | 2 [ ]                       | 5 [ ]                      | 951-952          |
| d. FOR COOKING  | 1 [ ]       | 0 [ ]               | 1 [ ]                        | 2 [ ]                       | 5 [ ]                      | 953-954          |
| e. FOR LIGHTING AND OTHER APPLIANCES                            | 1 [ ]       | 0 [ ]               | 1 [ ]                        | 2 [ ]                       | 5 [ ]                      | 955-956          |
| <b>GAS FROM UNDERGROUND PIPES<br/>SERVING YOUR NEIGHBORHOOD</b> |             |                     |                              |                             |                            |                  |
| f. FOR HOT WATER  | 1 [ ]       | 0 [ ]               | 1 [ ]                        | 2 [ ]                       | 5 [ ]                      | 957-958          |
| g. FOR HEATING YOUR HOME  | 1 [ ]       | 0 [ ]               | 1 [ ]                        | 2 [ ]                       | 5 [ ]                      | 959-960          |
| h. FOR CENTRAL AIR-CONDITIONING                                 | 1 [ ]       | 0 [ ]               | 1 [ ]                        | 2 [ ]                       | 5 [ ]                      | 961-962          |
| i. FOR COOKING INSIDE HOME                                      | 1 [ ]       | 0 [ ]               | 1 [ ]                        | 2 [ ]                       | 5 [ ]                      | 963-964          |
| j. FOR COOKING ON OUTDOOR GRILL                                 | 1 [ ]       | 0 [ ]               | 1 [ ]                        | 2 [ ]                       | 5 [ ]                      | 965-966          |
| k. FOR OTHER APPLIANCES (INCLUDE<br>OUTSIDE GAS LIGHT HERE)     | 1 [ ]       | 0 [ ]               | 1 [ ]                        | 2 [ ]                       | 5 [ ]                      | 967-968          |
| <b>LPG GAS (BOTTLED OR TANK GAS)</b>                            |             |                     |                              |                             |                            |                  |
| l. FOR HOT WATER  | 1 [ ]       | 0 [ ]               | 1 [ ]                        | 2 [ ]                       | 5 [ ]                      | 969-970          |
| m. FOR HEATING YOUR HOME  | 1 [ ]       | 0 [ ]               | 1 [ ]                        | 2 [ ]                       | 5 [ ]                      | 971-972          |
| n. FOR CENTRAL AIR-CONDITIONING                                 | 1 [ ]       | 0 [ ]               | 1 [ ]                        | 2 [ ]                       | 5 [ ]                      | 973-974          |
| o. FOR COOKING INSIDE HOME                                      | 1 [ ]       | 0 [ ]               | 1 [ ]                        | 2 [ ]                       | 5 [ ]                      | 975-976          |
| p. FOR COOKING ON OUTDOOR GRILL                                 | 1 [ ]       | 0 [ ]               | 1 [ ]                        | 2 [ ]                       | 5 [ ]                      | 977-978          |
| q. FOR OTHER APPLIANCES (INCLUDE<br>OUTSIDE GAS LIGHT HERE)     | 1 [ ]       | 0 [ ]               | 1 [ ]                        | 2 [ ]                       | 5 [ ]                      | 979-980          |
| <b>FUEL OIL</b>   |             |                     |                              |                             |                            |                  |
| r. FOR HOT WATER  | 1 [ ]       | 0 [ ]               | 1 [ ]                        | 2 [ ]                       | 5 [ ]                      | 1007-<br>1008:10 |
| s. FOR HEATING YOUR HOME  | 1 [ ]       | 0 [ ]               | 1 [ ]                        | 2 [ ]                       | 5 [ ]                      | 1011-1012        |
| t. FOR COOKING AND OTHER USES                                   | 1 [ ]       | 0 [ ]               | 1 [ ]                        | 2 [ ]                       | 5 [ ]                      | 1013-1014        |
| <b>KEROSENE</b>   |             |                     |                              |                             |                            |                  |
| u. FOR HOT WATER  | 1 [ ]       | 0 [ ]               | 1 [ ]                        | 2 [ ]                       | 5 [ ]                      | 1017-1018        |
| v. FOR HEATING YOUR HOME  | 1 [ ]       | 0 [ ]               | 1 [ ]                        | 2 [ ]                       | 5 [ ]                      | 1019-1020        |
| w. FOR COOKING AND OTHER USES                                   | 1 [ ]       | 0 [ ]               | 1 [ ]                        | 2 [ ]                       | 5 [ ]                      | 1021-1022        |

**FOR EACH USE OF EACH FUEL, ASK:**

121. Is that paid for by your household, included in  
your rent, or do you get it some other way?

**TAKE BACK EXHIBIT 120**

**IF GAS FROM UNDERGROUND PIPES IS NOT USED, ASK Q. 122. OTHERWISE, SKIP TO INSTRUCTION AT  
TOP OF NEXT PAGE.**

122. Is gas from underground pipes available in this  
neighborhood?

1 [ ] YES

0 [ ] NO

1023

6 [ ] DON'T KNOW

INTERVIEWER: IF USE OF ANY FUEL IS "PAID BY HOUSEHOLD" IN QUESTIONS ON PRECEDING PAGE,  
CONTINUE BELOW. OTHERWISE, SKIP TO INSTRUCTION FOR Q. 147 ON PAGE 35.

1024

123. A budget plan is a plan under which the utility company or fuel dealer and household agree that the household will pay the same amount for fuel each month for a number of months. Is your household on a budget plan for the main fuel used to heat your home?       YES       NO

(INTERVIEWER: THERE IS NO QUESTION 124.)

TURN TO EXHIBIT 125/126

125. Do any of your household fuel bills include costs of fuel used for purposes other than for your own living quarters, such as farm buildings or machinery, the house or apartment of another household, a business or office, or anything else?       YES       NO -- TAKE BACK EXHIBIT 125/126 --  
SKIP TO INSTRUCTIONS FOR Q. 133 ON PAGE 30.

IF "YES," ASK:

126. For which of the purposes listed on the exhibit are costs of fuel included in your household fuel bills?  
(INTERVIEWER: MARK ALL THAT APPLY.)

- |  |      |
|--|------|
| <input type="checkbox"/> FARM BUILDINGS OR MACHINERY                 | 1031 |
| <input type="checkbox"/> THE HOUSE OR APARTMENT OF ANOTHER HOUSEHOLD | 1032 |
| <input type="checkbox"/> A BUSINESS OR OFFICE                        | 1033 |
| <input type="checkbox"/> OTHER PURPOSES (SPECIFY): _____             | 1034 |

**IF "YES" ON Q. 125, CONTINUE BELOW**

**127.** Which fuel bills include costs of fuel used for purposes other than your own living quarters? (MARK AS MANY AS APPLY.)

- |  |      |
|--|------|
| <input type="checkbox"/> ELECTRICITY                   | 1035 |
| <input type="checkbox"/> GAS FROM UNDERGROUND PIPES    | 1036 |
| <input type="checkbox"/> LPG GAS (BOTTLED OR TANK GAS) | 1037 |
| <input type="checkbox"/> FUEL OIL                      | 1038 |
| <input type="checkbox"/> KEROSENE                      | 1039 |

**TURN TO EXHIBIT 128/132****IF "ELECTRICITY" ON Q. 127, ASK:**

**128.** Over the period of a year, about how much of your household's electricity bill is used for non-household uses such as farm buildings or machinery, the house or apartment of another household, a business or office, or anything else?

0  VERY LITTLE (LESS THAN 5%)

1  1/4 (5 - 33%)

1040

2  1/2 (34 - 66%)

3  3/4 (67 - 95%)

**IF "GAS FROM UNDERGROUND PIPES" ON Q. 127, ASK:**

**129.** Over the period of a year, about how much of your household's gas bill is used for non-household uses such as farm buildings or machinery, the house or apartment of another household, a business or office, or anything else?

0  VERY LITTLE (LESS THAN 5%)

1  1/4 (5 - 33%)

1041

2  1/2 (34 - 66%)

3  3/4 (67 - 95%)

**IF "LPG GAS" ON Q. 127, ASK:**

**130.** Over the period of a year, about how much of your household's LPG bill is used for non-household uses such as farm buildings or machinery, the house or apartment of another household, a business or office, or anything else?

0  VERY LITTLE (LESS THAN 5%)

1  1/4 (5 - 33%)

1042

2  1/2 (34 - 66%)

3  3/4 (67 - 95%)

**IF "FUEL OIL" ON Q. 127, ASK:**

**131.** Over the period of a year, about how much of your household's fuel oil bill is used for non-household uses such as farm buildings or machinery, the house or apartment of another household, a business or office, or anything else?

0  VERY LITTLE (LESS THAN 5%)

1  1/4 (5 - 33%)

1043

2  1/2 (34 - 66%)

3  3/4 (67 - 95%)

**IF "KEROSENE" ON Q. 127, ASK:**

**132.** Over the period of a year, about how much of your household's kerosene bill is used for non-household uses, such as farm buildings or machinery, the house or apartment of another household, a business or office, or anything else?

0  VERY LITTLE (LESS THAN 5%)

1  1/4 (5 - 33%)

1044

2  1/2 (34 - 66%)

3  3/4 (67 - 95%)

**TAKE BACK EXHIBIT 128/132**

IF HOUSEHOLD USES AND PAYS FOR LPG GAS (SEE QUESTIONS 120-121 PARTS 1-q), ASK Q. 133ff., OTHERWISE, SKIP TO INSTRUCTION FOR Q. 136.

133. About how many deliveries of LPG does your household usually get in a year?      NUMBER OF DELIVERIES:       1045-  
1046

- CASH AND CARRY, PICK UP AT STORE  
 LIVED HERE LESS THAN 1 YEAR

134. Did you buy LPG for this (house/apartment) in the past 12 months from one company or from more than one company?      1[] ONE COMPANY      1047  
2[] MORE THAN ONE COMPANY

IF "MORE THAN ONE COMPANY," ASK:

135. How many different companies?      2[] TWO  
3[] THREE      1048  
4[] FOUR OR MORE

IF HOUSEHOLD USES AND PAYS FOR FUEL OIL (SEE QUESTIONS 120-121 PARTS r-t), ASK Q. 136, OTHERWISE, SKIP TO INSTRUCTION FOR Q. 140.

136. About how many deliveries of fuel oil does your household usually get in a year?      NUMBER OF DELIVERIES:       1049-  
1050

- CASH AND CARRY, PICK UP AT STORE  
 LIVED HERE LESS THAN 1 YEAR

137. Did you buy fuel oil for this (house/apartment) in the past 12 months from one company or from more than one company?      1[] ONE COMPANY      1051  
2[] MORE THAN ONE COMPANY

IF "MORE THAN ONE," ASK:

138. How many different companies?      2[] TWO  
3[] THREE      1052  
4[] FOUR OR MORE

#### HAND RESPONDENT EXHIBIT 139

139. About how much fuel oil does household use in a year -- which of these groups would it be, just approximately? PROBE FOR BEST ESTIMATE.      1[] LESS THAN 100 GALLONS PER YEAR  
2[] 100-499 GALLONS PER YEAR  
3[] 500-999 GALLONS PER YEAR      1053  
4[] 1000 OR MORE GALLONS PER YEAR

#### TAKE BACK EXHIBIT 139

IF HOUSEHOLD USES AND PAYS FOR KEROSENE (SEE QUESTIONS 120-121 PARTS u-w), ASK Q. 140ff. OTHERWISE, SKIP TO INSTRUCTION FOR Q. 144.

140. During the past 12 months, did you have kerosene delivered to your home, did you buy it and bring it home, or did you get kerosene both ways? (MARK ALL THAT APPLY).

- 1 [ ] DELIVERED -- GO TO Q. 140a  
 2 [ ] BOUGHT AND BROUGHT HOME -- GO TO Q. 140b  
 0 [ ] NO KEROSENE DELIVERED OR BOUGHT IN PAST 12 MONTHS --  
 SKIP TO INSTRUCTION FOR Q. 144

IF "DELIVERED," ASK:

- 140a. How many different companies or stores delivered kerosene to your home in the past 12 months?

- 1 [ ] ONE  
 2 [ ] TWO  
 3 [ ] THREE  
 4 [ ] FOUR OR MORE

1562

1563

IF "BOUGHT AND BROUGHT HOME," ASK:

- 140b. About how much per gallon did you pay for kerosene, on the average?

PRICE PER GALLON: \$ \_\_\_\_\_  
 1 [ ] DON'T KNOW

1564-

1566

IF "DON'T KNOW," PROBE: About how much did you pay in total each time you bought kerosene?

1567-

1570

141. How many times in the past 12 months did you (have kerosene delivered/buy kerosene)?

PAYMENT: \$ \_\_\_\_\_  
 TOTAL NUMBER OF  
 DELIVERIES/  
 PURCHASES FOR  
 PAST 12 MONTHS: \_\_\_\_\_  
 2 [ ] DON'T KNOW

1571-

1572

IF TOTAL NUMBER GIVEN ON Q. 141, ASK:

142. On the average, about how many gallons of kerosene did you (have delivered/buy) each time?

NUMBER OF  
 GALLONS: \_\_\_\_\_  
 3 [ ] DON'T KNOW

1573-

1575

IF "DON'T KNOW" ON Q. 141, ASK:

143. Altogether, about how many gallons of kerosene did you (have delivered/buy) during the past 12 months?

NUMBER OF  
 GALLONS: \_\_\_\_\_  
 4 [ ] DON'T KNOW

1576-

1579

IF "DON'T KNOW" ON Q. 143, HAND RESPONDENT EXHIBIT 143.

- 143a. Using this card, can you tell me which group best describes the amount of kerosene your household used in the past 12 months? PROBE FOR BEST ESTIMATE.

- 1 [ ] LESS THAN 25 GALLONS  
 2 [ ] 25 - 49 GALLONS  
 3 [ ] 50 - 99 GALLONS  
 4 [ ] 100 - 499 GALLONS  
 5 [ ] 500 - 999 GALLONS  
 6 [ ] 1,000 OR MORE GALLONS

1580

TAKE BACK EXHIBIT 143

**CONTINUE IF ANY ELECTRIC, GAS (FROM UNDERGROUND PIPES OR LPG), FUEL OIL, OR KEROSENE BILLS ARE PAID BY HOUSEHOLD. OTHERWISE, SKIP TO INSTRUCTION FOR Q. 147.**

144. In addition to the types of fuel you use, we are interested in the quantities used and in the amount that people pay for electricity, gas, fuel oil, or kerosene in different parts of the United States.

I have a form that would authorize the companies that supply your household to provide that information to Response Analysis Corporation. The authorization applies to the period from September 1986 through December 1990.

Since this study is being done nationwide, it will give a good picture of the differences in fuel cost and usage all over the country. The information is needed to help establish important national energy policies.

**INTERVIEWER:** REMOVE THE AUTHORIZATION FORM FROM THE QUESTIONNAIRE AND HAND TO RESPONDENT. EITHER YOU OR RESPONDENT SHOULD FILL IN THE NAME(S) OF COMPANIES. IF MORE THAN ONE LPG OR FUEL OIL OR KEROSENE COMPANY HAS BEEN USED SINCE SEPTEMBER 1, 1986, FILL IN ADDITIONAL COMPANY NAMES ON OTHER SIDE OF FORM. PLEASE PRINT.

[ ] AUTHORIZATION FORM SIGNED

[ ] AUTHORIZATION FORM NOT SIGNED -- INTERVIEWER, EXPLAIN BELOW:

1059

**IF AUTHORIZATION FORM IS SIGNED, ASK Q. 145ff, OTHERWISE, SKIP TO INSTRUCTION FOR Q. 147**

145. Do your fuel bills come addressed to (NAME OF SIGNATURE ON AUTHORIZATION FORM), or are they in another name?  [ ] SAME NAME -- SKIP TO Q. 146 1060  
 [ ] ANOTHER NAME

IF BILL IS IN ANOTHER NAME, ASK:

- 145a. What is that name and address:

BILLING NAME: \_\_\_\_\_

STREET ADDRESS: \_\_\_\_\_

CITY AND STATE: \_\_\_\_\_

ZIP CODE: \_\_\_\_\_

146. Would it be possible for you to give me your customer number at your electric/gas company? This number is on your bills from the company.

ELECTRIC COMPANY -- CUSTOMER NUMBER: \_\_\_\_\_ 1061

[ ] NOT AVAILABLE/REFUSED

GAS (FROM UNDERGROUND PIPES) -- CUSTOMER NUMBER: \_\_\_\_\_ 1062

[ ] NOT AVAILABLE/REFUSED

INTERVIEWER

THE AUTHORIZATION FORM IS TO BE FILLED  
OUT AT THIS POINT IN THE INTERVIEW. USE  
THE SEPARATE FORM THAT IS INSERTED IN THE  
QUESTIONNAIRE.



IF HOUSEHOLD HAS ONE OR MORE FUELS "INCLUDED IN RENT" OR "OTHER" (SEE Q. 121), ASK Q. 147  
OTHERWISE, SKIP TO Q. 148.

147. We may be needing some additional information about fuels used in this building (house).  
May I have the name of the person or company to whom you pay rent or who is responsible  
for paying the fuel bills for this building (house)?

NAME: \_\_\_\_\_ 1063

TELEPHONE NUMBER: (AREA CODE: \_\_\_\_\_)

STREET ADDRESS: \_\_\_\_\_

CITY OR TOWN/STATE/ZIP CODE: \_\_\_\_\_

**ASK EVERYONE**

148. For interview verification purposes, may I have your name, phone number, and mailing address please?

RESPONDENT'S NAME: \_\_\_\_\_

TELEPHONE NUMBER: (AREA CODE: \_\_\_\_\_)

STREET ADDRESS: \_\_\_\_\_

CITY OR TOWN/STATE/ZIP CODE: \_\_\_\_\_

IF APARTMENT, MOBILE HOME/TRAILER COMPLEX AND THE  
NAME OF THE COMPLEX IS NOT INCLUDED IN THE ADDRESS  
ABOVE, ASK:

149. Does this (building/development/complex/park)  
have a name?

[ ] YES

[ ] NO

IF "YES," ASK:

150. What is the name?

NAME: \_\_\_\_\_

## ASK EVERYONE

Now some questions about cars.

151. How many members of your household can drive a car?

NUMBER OF DRIVERS:  525-  
526  
[ ] NONE

HAND RESPONDENT EXHIBIT 152

152. Do you or other members of your household own or have the regular use of any cars, trucks, vans, or similar vehicles? (DO NOT INCLUDE MOTORCYCLES OR MOPEDS. SEE INSTRUCTION BELOW.)

1 [ ] YES 527  
0 [ ] NO -- TAKE BACK EXHIBIT 152 AND SKIP TO Q. 165

IF "YES," ASK:

153. How many do you have?

NUMBER OF VEHICLES:  528-  
529

ASK ABOUT EACH VEHICLE.

154. Which type(s) do you have?  
(SEE INSTRUCTION BELOW.)

607-608:06

| VEHICLE NUMBER          |                    |                    |                    |                    |
|-------------------------|--------------------|--------------------|--------------------|--------------------|
| 1                       | 2                  | 3                  | 4                  |                    |
| STANDARD PASSENGER CAR  | 01 [ ] 530-<br>531 | 01 [ ] 553-<br>554 | 01 [ ] 511-<br>612 | 01 [ ] 634-<br>635 |
| 2-SEAT CAR              | 02 [ ]             | 02 [ ]             | 02 [ ]             | 02 [ ]             |
| STATION WAGON           | 03 [ ]             | 03 [ ]             | 03 [ ]             | 03 [ ]             |
| LARGE VAN               | 04 [ ]             | 04 [ ]             | 04 [ ]             | 04 [ ]             |
| MINI VAN                | 05 [ ]             | 05 [ ]             | 05 [ ]             | 05 [ ]             |
| PICKUP TRUCK            | 06 [ ]             | 06 [ ]             | 06 [ ]             | 06 [ ]             |
| JEEP OR SIMILAR VEHICLE | 07 [ ]             | 07 [ ]             | 07 [ ]             | 07 [ ]             |
| OTHER (SPECIFY):        | 21 [ ]             | 21 [ ]             | 21 [ ]             | 21 [ ]             |
|                         |                    |                    |                    |                    |
|                         | 532-533            | 555-556            | 613-614            | 636-637            |
| MAKE                    | 534-535            | 557-558            | 615-616            | 638-639            |
| MODEL NAME              | 536-537            | 559-560            | 617-618            | 640-641            |
| MODEL YEAR              | 19                 | 19                 | 19                 | 19                 |

TAKE BACK EXHIBIT 152

155. Please tell me the make and model name (of each one).  
(SEE INSTRUCTION BELOW.)

MAKE

156. What is the model year (of each one)?  
(ENTER LAST 2 DIGITS OF MODEL YEAR)

MODEL NAME

MODEL YEAR

**INTERVIEWER INSTRUCTIONS:**

Q. 152 -- "Regular use" means keeping the vehicle at home.

Q. 154 -- If household has more than four vehicles, mark answers for the four vehicles used most.

Q. 155 -- A model name may consist of several parts -- be sure to get the complete model name. Here are some examples, where the complete model name is in parentheses: Ford (Galaxie), Chevrolet (V10 Suburban), GMC (V15 Jimmy), Toyota (2WD Cargo Van). If respondent does not know the model name of a truck, probe for size (1/2 ton, 3/4 ton, etc.).

**CONTINUE IF ONE OR MORE VEHICLES ON Q. 153; OTHERWISE SKIP TO Q. 165**

ASK Q's. 157-164 FIRST ABOUT FIRST VEHICLE, THEN SECOND VEHICLE, THIRD, AND FOURTH; REPEAT MAKE AND MODEL OF EACH VEHICLE.

USE COLUMNS FOR VEHICLE NUMBERS CORRESPONDING TO THOSE ON PRECEDING PAGE

These next questions are about your (MAKE & MODEL 1 / MAKE & MODEL 2 / MAKE & MODEL 3 / MAKE & MODEL 4.)

157. Did you get this vehicle within the past 12 months or did you have it before that?

WITHIN PAST 12 MONTHS  
ASK Q. 158

HAD IT MORE THAN 12 MONTHS  
SKIP TO Q. 160

IF "WITHIN PAST 12 MONTHS," ASK:

158. In what month and year did you get it?

MONTH

YEAR

198 \_\_\_\_\_

**VEHICLE NUMBER**

1

2

3

4

538

561

619

642

1 [ ]

1 [ ]

1 [ ]

1 [ ]

2 [ ]

2 [ ]

2 [ ]

2 [ ]

539-542

562-565

620-623

643-646

159. Approximately how many miles has it been driven since you have had it?

MILES

DON'T KNOW

543-547

566-570

624-628

647-651

[ ]

[ ]

[ ]

[ ]

IF "HAD IT MORE THAN 12 MONTHS" ON Q. 157, ASK:

160. Approximately how many miles was it driven during the past 12 months?

MILES

DON'T KNOW

548-552

571-575

629-633

652-656

[ ]

[ ]

[ ]

[ ]

161. I would like to obtain the odometer reading and Vehicle Identification Number for this vehicle -- directly from the vehicle. Is the vehicle available right now so that we may get this information?

YES

CHECK HERE AND ASK Q. 164

NO

GO TO NEXT PAGE AND ASK Q's 162-163

|                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|--------------------------|--------------------------|--------------------------|--------------------------|



INSPECT EACH VEHICLE MARKED "YES" ON Q. 161 AFTER YOU COMPLETE HOUSE MEASUREMENTS IN Q's 180-184.

IF "NO" ON Q. 161 (THIS CAR IS NOT AVAILABLE) ASK Q. 162. IF "YES" ON Q. 161, ASK Q. 157 FOR NEXT VEHICLE; IF NO OTHER VEHICLES, SKIP TO Q. 165.

162. Do you know approximately what the odometer reading is for this vehicle?

HAND RESPONDENT EXHIBIT 163.

163. I would still like to record the Vehicle Identification Number for this vehicle. Do you know what a Vehicle Identification Number is? (IF DON'T KNOW, EXPLAIN VIN.) What is the Vehicle Identification Number for this vehicle? (SEE INSTRUCTIONS BELOW.)

**INTERVIEWER: REPORT HERE IF VIN REFUSED FOR ONE OR MORE VEHICLES.**

EXPLAIN RESPONDENT REACTION OR REASON FOR REFUSING VIN.

|   |   |  |           |
|---|---|--|-----------|
|   |   | Make _____ Model _____                                     |           |
| V | 1 | [ ] ODOMETER KNOWN<br>1360<br>(ESTIMATED ODOMETER READING) | 1353-1358 |
| E | 1 | [ ] ODOMETER NOT KNOWN<br>0                                |           |
| H |   | VIN: 1362 _____  | 1378      |
|   |   | [ ] VIN OBTAINED [ ] VIN NOT OBTAINED [ ] VIN REFUSED<br>8 | 1380      |
| I |   | Make _____ Model _____                                     |           |
| C | 2 | [ ] ODOMETER KNOWN<br>1418<br>(ESTIMATED ODOMETER READING) | 1411-1416 |
| L | 2 | [ ] ODOMETER NOT KNOWN<br>0                                |           |
| E |   | VIN: 1420 _____  | 1436      |
|   |   | [ ] VIN OBTAINED [ ] VIN NOT OBTAINED [ ] VIN REFUSED<br>8 | 1438      |
| N | 3 | Make _____ Model _____                                     |           |
| U |   | [ ] ODOMETER KNOWN<br>1447<br>(ESTIMATED ODOMETER READING) | 1440-1445 |
| M |   | [ ] ODOMETER NOT KNOWN<br>0                                |           |
| B |   | VIN: 1449 _____  | 1465      |
|   |   | [ ] VIN OBTAINED [ ] VIN NOT OBTAINED [ ] VIN REFUSED<br>8 | 1467      |
| E | 4 | Make _____ Model _____                                     |           |
| R |   | [ ] ODOMETER KNOWN<br>1625<br>(ESTIMATED ODOMETER READING) | 1618-1623 |
|   |   | [ ] ODOMETER NOT KNOWN<br>0                                |           |
|   |   | VIN: 1627 _____  | 1643      |
|   |   | [ ] VIN OBTAINED [ ] VIN NOT OBTAINED [ ] VIN REFUSED<br>8 | 1645      |

#### INTERVIEWER INSTRUCTIONS:

Q. 163 -- Explain what the VIN is if respondent does not know.

If respondent questions need for VIN, say:

"The VIN is a set of codes assigned to a vehicle at the factory that, when decoded, describes several of the vehicle's characteristics. These characteristics may then be used to calculate an estimated miles per gallon for that specific type of vehicle."

Review the exhibit card of possible VIN locations. Record the VIN and verify for correctness.

RECORD VEHICLE INSPECTION(S) BELOW.

IF "YES" ON Q. 161, SKIP THIS PAGE (Q. 164) FOR NOW. ASK Q. 157 FOR NEXT VEHICLE (IF NO OTHER VEHICLES, SKIP TO Q. 165).  
AFTER COMPLETING Qs. 165-179 AND THE MEASUREMENT PROCEDURE IN Qs. 180-184, INSPECT ALL VEHICLES MARKED "YES" ON Q. 161. RECORD VEHICLE INSPECTION(S) BELOW.

164. (SEE INSTRUCTIONS BELOW.)

|                       |  |
|-----------------------|--|
| V<br>E<br>H           | Make _____ Model _____<br><input type="checkbox"/> ODOMETER OBTAINED <sup>3</sup> (ODOMETER READING FROM VEHICLE)<br><small>1360</small><br><input type="checkbox"/> ODOMETER NOT OBTAINED <sup>6</sup><br><input type="checkbox"/> ODOMETER REFUSED <sup>7</sup><br>VIN: <sup>1362</sup><br><input type="checkbox"/> VIN OBTAINED <sup>2</sup> <input type="checkbox"/> VIN NOT OBTAINED <sup>8</sup> <input type="checkbox"/> VIN REFUSED <sup>7</sup><br><small>1353-1358</small><br><small>1378</small><br><small>1380</small> |
| I<br>C<br>L<br>E      | Make _____ Model _____<br><input type="checkbox"/> ODOMETER OBTAINED <sup>2</sup> (ODOMETER READING FROM VEHICLE)<br><small>1418</small><br><input type="checkbox"/> ODOMETER NOT OBTAINED <sup>6</sup><br><input type="checkbox"/> ODOMETER REFUSED <sup>7</sup><br>VIN: <sup>1420</sup><br><input type="checkbox"/> VIN OBTAINED <sup>1</sup> <input type="checkbox"/> VIN NOT OBTAINED <sup>8</sup> <input type="checkbox"/> VIN REFUSED <sup>7</sup><br><small>1411-1416</small><br><small>1436</small><br><small>1438</small> |
| N<br>U<br>M<br>D<br>E | Make _____ Model _____<br><input type="checkbox"/> ODOMETER OBTAINED <sup>2</sup> (ODOMETER READING FROM VEHICLE)<br><small>1447</small><br><input type="checkbox"/> ODOMETER NOT OBTAINED <sup>6</sup><br><input type="checkbox"/> ODOMETER REFUSED <sup>7</sup><br>VIN: <sup>1449</sup><br><input type="checkbox"/> VIN OBTAINED <sup>1</sup> <input type="checkbox"/> VIN NOT OBTAINED <sup>8</sup> <input type="checkbox"/> VIN REFUSED <sup>7</sup><br><small>1440-1445</small><br><small>1465</small><br><small>1467</small> |
| R<br>4                | Make _____ Model _____<br><input type="checkbox"/> ODOMETER OBTAINED <sup>2</sup> (ODOMETER READING FROM VEHICLE)<br><small>1625</small><br><input type="checkbox"/> ODOMETER NOT OBTAINED <sup>6</sup><br><input type="checkbox"/> ODOMETER REFUSED <sup>7</sup><br>VIN: <sup>1627</sup><br><input type="checkbox"/> VIN OBTAINED <sup>1</sup> <input type="checkbox"/> VIN NOT OBTAINED <sup>8</sup> <input type="checkbox"/> VIN REFUSED <sup>7</sup><br><small>1618-1623</small><br><small>1643</small><br><small>1645</small> |

INTERVIEWER: REPORT HERE  
IF VIN REFUSED FOR ONE OR  
MORE VEHICLES.  
EXPLAIN RESPONDENT  
REACTION OR REASON FOR  
REFUSING VIN.

#### INTERVIEWER INSTRUCTIONS:

- Q. 164 -- If respondent questions need for VIN, say:  
 "The VIN is a set of codes assigned to a vehicle at the factory that, when decoded, describes several of the vehicle's characteristics. These characteristics may then be used to calculate an estimated miles per gallon for that specific type of vehicle."

Record VIN from the vehicle itself whenever possible. If VIN cannot be found on the vehicle, show Exhibit 163 (VIN LOCATIONS CARD), and attempt to secure VIN from one of these document sources.

165. INTERVIEWER: MARK TYPE OF HOUSING UNIT

- 1 [ ] MOBILE HOME OR TRAILER -- 1064-  
 SKIP TO Q. 169 1065
- 2 [ ] ONE-FAMILY HOUSE
- 1 [ ] ONE STORY ] IF ONE-FAMILY  
 2 [ ] TWO STORY HOUSE, MARK STYLE  
 3 [ ] THREE STORY BASED ON GENERAL  
 4 [ ] SPLIT-LEVEL APPEARANCE FROM  
 5 [ ] OTHER (SPECIFY): OUTSIDE

3 [ ] HOUSE OR BUILDING WITH 2 TO 4 UNITS --

SKIP TO Q. 172

- 4 [ ] APARTMENT BUILDING OR OTHER  
 STRUCTURE WITH 5 OR MORE UNITS --  
 SKIP TO Q. 175

**CONTINUE IF ONE-FAMILY HOUSE**

166. Do you have a garage attached to your living space or under your house?

- 1 [ ] YES  
 0 [ ] NO -- SKIP TO Q. 169 1066

IF "YES" ON Q. 166, ASK:

167. Can the garage be heated during the winter months?

- 1 [ ] YES  
 0 [ ] NO -- SKIP TO Q. 169 1067

IF "YES" ON Q. 167, HAND RESPONDENT EXHIBIT 168 AND ASK:

168. How frequently is the garage heated during the winter months?

- 4 [ ] ALWAYS  
 3 [ ] USUALLY  
 2 [ ] OCCASIONALLY 1068  
 1 [ ] ALMOST NEVER  
 0 [ ] NEVER  
 5 [ ] OTHER (SPECIFY):

TAKE BACK EXHIBIT 168

CONTINUE WITH Q. 169 ON NEXT PAGE

**IF ONE-FAMILY HOUSE OR MOBILE HOME, ASK Q. 169.**

**HAND RESPONDENT EXHIBIT 169**

169. Does your home have a basement, an enclosed crawl space, a crawl space open to the outside, a concrete slab, or a combination of these?

- |   |      |
|---|------|
| <input type="checkbox"/> BASEMENT                           | 1069 |
| <input type="checkbox"/> CRAWL SPACE -- ENCLOSED            |      |
| <input type="checkbox"/> CRAWL SPACE -- OPEN TO THE OUTSIDE |      |
| <input type="checkbox"/> CONCRETE SLAB -- SKIP TO Q. 175    |      |
| <input type="checkbox"/> COMBINATION (MARK ALL THAT APPLY.) |      |
| <input type="checkbox"/> BASEMENT                           | 1070 |
| <input type="checkbox"/> CRAWL SPACE -- ENCLOSED            | 1071 |
| <input type="checkbox"/> CRAWL SPACE -- OPEN TO THE OUTSIDE | 1072 |
| <input type="checkbox"/> CONCRETE SLAB                      | 1073 |

**TAKE BACK EXHIBIT 169**

**IF "BASEMENT," "CRAWL SPACE," OR "COMBINATION," ASK:**

170. About how much of the basement or crawl space would you say is warm enough to sit, work or play in during the winter months -- all, part, or none?

- |  |      |
|--|------|
| <input type="checkbox"/> ALL -- SKIP TO Q. 175 |      |
| <input type="checkbox"/> PART                  | 1074 |
| <input type="checkbox"/> NONE                  |      |

**IF "PART," OR "NONE," HAND RESPONDENT EXHIBIT 171 AND ASK:**

171. About how much of the floor area above the unheated basement or crawl space is insulated?

- |   |      |
|---|------|
| <input type="checkbox"/> NONE, VERY LITTLE (LESS THAN 5%) |      |
| <input type="checkbox"/> 1/4 (5 - 33%)                    |      |
| <input type="checkbox"/> 1/2 (34 - 66%)                   | 1075 |
| <input type="checkbox"/> 3/4 (67 - 95%)                   |      |
| <input type="checkbox"/> ALL (96 - 100%)                  |      |
| <input type="checkbox"/> DON'T KNOW                       |      |

**TAKE BACK EXHIBIT 171 -- SKIP TO Q. 175**

IF THIS IS A BUILDING WITH 2 TO 4 HOUSING UNITS, ASK Q. 172 OTHERWISE, SKIP TO Q.175.

172. Does this building have a basement?                    1[ ] YES                    1076  
    0[ ] NO -- SKIP TO Q. 175

IF "YES," ASK:

173. Is any part of the basement for the exclusive or primary use of your household?                    1[ ] YES                    1077  
    0[ ] NO -- SKIP TO Q. 175

IF "YES," ASK:

174. Thinking of the basement space used by your household -- about how much of that space is warm enough to sit, work or play in during the winter months -- all, part, or none?                    1[ ] ALL                    1078  
    2[ ] PART  
    0[ ] NONE

**ASK EVERYONE****HAND RESPONDENT EXHIBIT 175**1107-  
1108:11

175. Since September 1984, have any of the kinds of things listed on this exhibit been done to your home -- that is, anything that has either increased or decreased the total number of square feet of space, or that has changed the number of square feet of heated space?

IF "YES" ON Q 175 ASK:

176. Did the total number of square feet of space increase, decrease, or remain the same?

1  
2  
3

1111

1  
2  
3

1112

1  
2  
3

1113

1  
2  
3

1114

1  
2  
3

1115

1  
2  
3

1116

1  
2  
3

1117

1  
2  
3

1118

1  
2  
3

1119

177. Did the amount of heated space increase, decrease, or remain the same?

1  
2  
3

1114

1  
2  
3

1115

1  
2  
3

1116

1  
2  
3

1117

1  
2  
3

1118

1  
2  
3

1119

178. Please give me a description of the work that was done.

1114-

1115

1116-

1117

1118

1119

179. In what month and year was the work completed?

MONTH: \_\_\_\_\_

YEAR: 198\_\_\_\_\_

[ ] IN PROCESS

**TAKE BACK EXHIBIT 175**

1116-

1117

1118

1119

180. So far, we've been talking about things in your household that affect your energy use. What we need also is a measure of your year-round living space.

With your permission, I would like to measure your home. I can do it from the inside or the outside. With your home, I think it would be most accurate to do it on the (inside/outside).

### **INTERVIEWER INSTRUCTIONS:**

In general, measure all parts of the housing unit enclosed from the weather.

#### Basements or cellars

Include basements or cellars in one-family houses.

Include basement space in buildings with 2 to 4 housing units, if it is for the exclusive or primary use of household for this interview. See Q. 173.

Exclude basements and cellars in buildings with 5 or more units.

Exclude crawl spaces.

#### Attics

Include attics if heated or finished.

Exclude attics if unheated and also unfinished.

#### Garages, sheds, or barns

Include garages if attached to house and enclosed from the weather.

Exclude garages, sheds, or barns if not attached to house or if open to the weather.

#### Porches

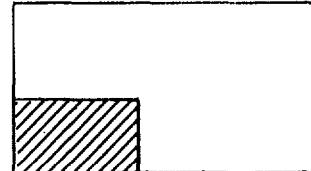
Include porches if enclosed from the weather.

Exclude porches if open to the weather.

Buildings with 2 or more housing units: Measure only the space used by household for this interview (do not measure the entire building).

Unheated areas: Within the housing unit that you measure, indicate unheated area(s) in the diagrams with lines. Give dimensions of unheated area(s).

Indicate unheated  
areas this way →



USE BACKS OF MEASUREMENT PAGES FOR ADDITIONAL SPACE AS NEEDED, FOR SKETCHES AND MEASUREMENTS.

RECORD MEASUREMENTS ON DIAGRAM TO NEAREST FOOT

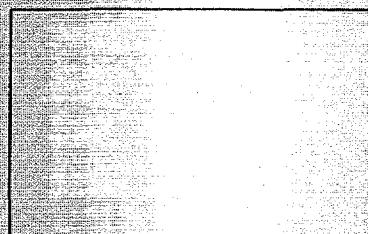
START HERE



if this household has a basement or cellar (see instruction on facing page for basements and cellars)

|                       |  |
|-----------------------|--|
| BASEMENT MEASUREMENTS | <input type="checkbox"/> FULL BASEMENT<br><input type="checkbox"/> HALF BASEMENT |
|-----------------------|--|

RECTANGULAR SHAPE



DRAW DIAGRAM, IF OTHER THAN RECTANGULAR



INTERVIEWER: HAVE YOU MARKED WITH LINES AND GIVEN DIMENSIONS OF UNHEATED AREAS IN DIAGRAM ABOVE?

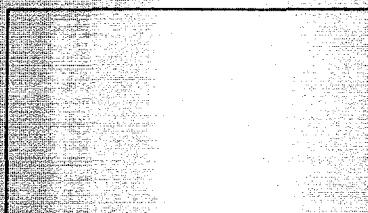
START HERE



if this household does not have a basement or cellar

|                          |  |
|--------------------------|--|
| FIRST STORY MEASUREMENTS | <input type="checkbox"/> FULL STORY<br><input type="checkbox"/> HALF STORY |
|--------------------------|--|

RECTANGULAR SHAPE



DRAW DIAGRAM, IF OTHER THAN RECTANGULAR



INTERVIEWER: HAVE YOU MARKED WITH LINES AND GIVEN DIMENSIONS OF UNHEATED AREAS IN DIAGRAM ABOVE?

CONTINUE ON PAGE 47  
FOR SECOND AND THIRD STORIES

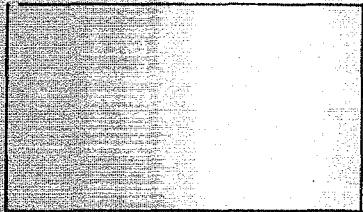
FOR OFFICE USE ONLY

| Fir Codes |    | Unit A |    |       | Unit B |    |       | Unit C |    |       | Unit D |    |       | # of Units |    |
|-----------|----|--------|----|-------|--------|----|-------|--------|----|-------|--------|----|-------|------------|----|
| 1120      | 41 | 22     | 23 | 24-25 | 26-27  | 28 | 29-30 | 31-32  | 33 | 34-35 | 36-37  | 38 | 39-40 | 41-42      | 43 |
| B         |    |        |    |       |        |    |       |        |    |       |        |    |       |            |    |
| 1144      | 45 | 46     | 47 | 48-49 | 50-51  | 52 | 53-54 | 55-56  | 57 | 58-59 | 60-61  | 62 | 63-64 | 65-66      | 67 |
| 1         |    |        |    |       |        |    |       |        |    |       |        |    |       |            |    |

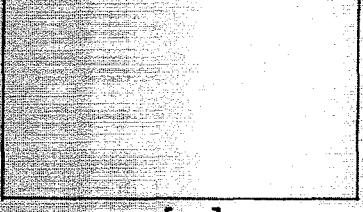


IF NO SECOND OR THIRD STORY TO MEASURE, GO TO Q. 181

RECORD MEASUREMENTS ON DIAGRAM TO NEAREST FOOT

|   |   |  |
|---|---|--|
| SECOND STORY MEASUREMENTS   |   | <input type="checkbox"/> FULL STORY<br><input type="checkbox"/> HALF STORY |
| RECTANGULAR SHAPE   | DRAW DIAGRAM, IF OTHER THAN RECTANGULAR   |  |
| [  ] | [  ] |  |
| [  ] |   |  |

INTERVIEWER: HAVE YOU MARKED WITH LINES AND GIVEN DIMENSIONS OF UNHEATED AREAS IN DIAGRAM ABOVE?

|   |   |  |
|---|---|--|
| THIRD STORY MEASUREMENTS  |   | <input type="checkbox"/> FULL STORY<br><input type="checkbox"/> HALF STORY |
| RECTANGULAR SHAPE   | DRAW DIAGRAM, IF OTHER THAN RECTANGULAR   |  |
| [  ] | [  ] |  |
| [  ] |   |  |

INTERVIEWER: HAVE YOU MARKED WITH LINES AND GIVEN DIMENSIONS OF UNHEATED AREAS IN DIAGRAM ABOVE?

FOR OFFICE USE ONLY

1207-1208:12

|   | FLR Codes |    |    | Unit A |       |       | Unit B |       |       | Unit C |       |       | Unit D |       |       | # of Units |
|---|-----------|----|----|--------|-------|-------|--------|-------|-------|--------|-------|-------|--------|-------|-------|------------|
| 1 | 69        | 70 | 71 | 72-73  | 74-75 | 76    | 77-78  | 79-80 | 1211  | 12-13  | 14-15 | 16    | 17-18  | 19-20 | 21    |            |
| 2 |           |    |    |        |       |       |        |       |       |        |       |       |        |       |       |            |
| 3 | 1222      | 23 | 24 | 25     | 26-27 | 28-29 | 30     | 31-32 | 33-34 | 35     | 36-37 | 38-39 | 40     | 41-42 | 43-44 | 45         |

| Heated    | Unheated  | DK Htd/Unhtd |
|-----------|-----------|--------------|
| 1246-1250 | 1251-1255 | 1256-1259    |



181. One part of my task is to mark on my diagram any parts of your home that are not heated during the heating season.

TELL RESPONDENT WHAT PARTS OF HOME, IF ANY, YOU HAVE MARKED AS NOT HEATED DURING HEATING SEASON. THEN ASK:

Is that correct -- have I missed any unheated areas?

REVISE SKETCHES AS NECESSARY;  
THEN MARK APPROPRIATE BOX AT  
RIGHT.

- NO UNHEATED AREAS 1260  
 ALL UNHEATED AREAS HAVE BEEN  
MARKED WITH LINES 

- ENTIRE UNIT IS UNHEATED (NO  
HEATING EQUIPMENT)

182. INTERVIEWER: MARK BOX TO INDICATE HOW  
MEASUREMENTS WERE OBTAINED FOR  
(HOUSE/APARTMENT).

INTERVIEWER INSTRUCTIONS:  
DOUBLE-CHECK MEASUREMENTS OBTAINED FROM PLANS  
OR FROM RESPONDENT ESTIMATES.

ESTIMATES SHOULD INCLUDE:

Basements  
Attached garages  
Finished or heated attics  
Enclosed porches

ESTIMATES SHOULD EXCLUDE:

Detached garages  
Attics that are unfinished and unheated  
Porches that are not permanently enclosed  
Areas under construction

- MEASURED INSIDE  
 MEASURED OUTSIDE 1261-  
 COMBINATION OF INSIDE AND 1262  
OUTSIDE MEASUREMENTS  
 RESPONDENT GAVE TOTAL  
SQUARE FEET FROM PLAN  
 RESPONDENT'S ESTIMATES  
 OTHER MEASUREMENT  
PROCEDURE (SPECIFY): \_\_\_\_\_

TURN PAGE TO COMPLETE INTERVIEW

FOR OFFICE  
USE ONLY

|    |     |
|----|-----|
| FL | LQT |
|    |     |

1263-1265

INTERVIEWER REPORT ON MEASUREMENT OF YEAR-ROUND LIVING SPACE

183. WHAT PROBLEMS, IF ANY, DID YOU HAVE IN MEASURING THIS (HOUSE/APARTMENT)?

184. WHAT EFFECT, IF ANY, DID THESE PROBLEMS HAVE ON THE ACCURACY OF YOUR MEASUREMENTS?

-----> PLEASE REMEMBER TO INSPECT  
VEHICLES FOR VIN NUMBERS

|                           |    |    |                              |
|---------------------------|----|----|------------------------------|
|                           |    |    | 1266-1268                    |
| TIME INTERVIEW COMPLETED: | AM | PM | LENGTH OF INTERVIEW: MINUTES |
| INTERVIEWER'S SIGNATURE   |    |    | DATE:                        |
| INTERVIEWER'S I.D. #:     |    |    | 1269-1274                    |



## U.S. DEPARTMENT OF ENERGY SURVEY

### Authorization Form for Residential Energy Consumption Survey

I hereby give permission to the company (companies) below to provide information to Response Analysis Corporation (or other designee of the U.S. Department of Energy) for confidential use in connection with their survey for the U.S. Department of Energy.

This authorization covers use of fuels (electricity, natural gas or LPG, fuel oil or kerosene) by my household from September 1, 1986 through December 31, 1990.

- 1) the total amount of fuels used by my household.
- 2) the total price charged for fuels by my household.

Companies are authorized to provide this information by monthly periods or by delivery date, whichever applies.

A photocopy of this authorization may be accepted with the same authority as the original.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

PLEASE  
PRINT

YOUR NAME

ADDRESS

APT. NO.

CITY OR POST OFFICE

STATE

ZIP CODE

TELEPHONE  
AREA CODE: \_\_\_\_\_ NUMBER: \_\_\_\_\_

PLEASE COMPLETE ONE BLOCK BELOW FOR EACH FUEL USED BY YOUR HOUSEHOLD  
(IF MORE THAN ONE SUPPLIER OF A PARTICULAR FUEL USE THE OTHER SIDE OF THIS SHEET)

ELECTRICITY

PRINT FULL NAME OF ELECTRIC COMPANY

LOCATION OF COMPANY (IF KNOWN) - CITY AND STATE

TELEPHONE  
AREA CODE: \_\_\_\_\_ NUMBER: \_\_\_\_\_

GAS

from underground pipes  
or LPG (bottled or tank gas)

PRINT FULL NAME OF GAS COMPANY

LOCATION OF COMPANY (IF KNOWN) - CITY AND STATE

TELEPHONE  
AREA CODE: \_\_\_\_\_ NUMBER: \_\_\_\_\_

FUEL OIL

or KEROSENE

PRINT FULL NAME OF OIL COMPANY

LOCATION OF COMPANY (IF KNOWN) - CITY AND STATE

TELEPHONE  
AREA CODE: \_\_\_\_\_ NUMBER: \_\_\_\_\_

GAS →  
LPG (bottled  
or tank gas)

**SECOND GAS COMPANY**

PRINT FULL NAME OF GAS COMPANY

LOCATION OF COMPANY (IF KNOWN) - CITY AND STATE

TELEPHONE  
AREA CODE: \_\_\_\_\_ NUMBER: \_\_\_\_\_

**THIRD GAS COMPANY**

PRINT FULL NAME OF GAS COMPANY

LOCATION OF COMPANY (IF KNOWN) - CITY AND STATE

TELEPHONE  
AREA CODE: \_\_\_\_\_ NUMBER: \_\_\_\_\_

FUEL OIL →  
or KEROSENE

**SECOND FUEL OIL/KEROSENE COMPANY**

PRINT FULL NAME OF OIL COMPANY

LOCATION OF COMPANY (IF KNOWN) - CITY AND STATE

TELEPHONE  
AREA CODE: \_\_\_\_\_ NUMBER: \_\_\_\_\_

**THIRD FUEL OIL/KEROSENE COMPANY**

PRINT FULL NAME OF OIL COMPANY

LOCATION OF COMPANY (IF KNOWN) - CITY AND STATE

TELEPHONE  
AREA CODE: \_\_\_\_\_ NUMBER: \_\_\_\_\_

F 4905-06

OMB No. 1905-0092  
Expires 5-31-90  
EIA-457C

**1987 RESIDENTIAL ENERGY CONSUMPTION SURVEY**  
**RENTAL AGENTS, LANDLORDS, AND APARTMENT MANAGERS**

| Time Started |
|--------------|
| AM           |
| PM           |

Hello, This is \_\_\_\_\_ from Response Analysis Corporation in Princeton, NJ.  
I'm calling about the Department of Energy study on residential energy uses that we wrote  
you about. Your answers are strictly confidential.

IF LETTER NOT RECEIVED: We will send you another copy and call back in a few days.

01-04

VERIFY ADDRESS ON CONTROL CARD.

05

1. I would like to get a brief description of the building at (GIVE ADDRESS, NOT NAME)  
as it was as of November 1987.

06:7

07-08

10-15

16-17

18-19

2. Was there a group of five or more housing units in the same building, a group of two to four units in the same building, a single unit in a building by itself, or would you describe it in some other way?

[ ] 5 OR MORE UNITS IN BUILDING -- ASK Q. 3a and Q. 3b

[ ] 2 TO 4 UNITS IN BUILDING -- ASK Q. 3a

[ ] SINGLE UNIT IN BUILDING BY ITSELF -- NO INTERVIEW ON THIS UNIT: CHECK FOR OTHER UNITS ON CONTROL CARD.

[ ] OTHER (DESCRIBE) \_\_\_\_\_

22

IF "2-4 UNITS" OR "5 OR MORE UNITS". ASK:

3a. How many residential units were in the building?

NUMBER OF UNITS: \_\_\_\_\_

23-25

IF "5 OR MORE UNITS." ASK:

3b. How many floors (stories) were in the building?

NUMBER OF FLOORS: \_\_\_\_\_

26-27

4. About when was the (house/building) built? (IF NOT KNOWN, ASK FOR "BEST ESTIMATE.")

01 [ ] BEFORE 1940

07 [ ] 1980 - 1983

28-29

02 [ ] 1940 - 1949

08 [ ] 1984

03 [ ] 1950 - 1959

09 [ ] 1985

04 [ ] 1960 - 1969

10 [ ] 1986

05 [ ] 1970 - 1974

11 [ ] 1987

06 [ ] 1975 - 1979

12 [ ] 1988

5. These next questions are about (IDENTIFY SPECIFIC HOUSING UNIT). As of November 1987, what was the main fuel used for home heating?

- 01[ ] GAS FROM UNDERGROUND PIPES SERVING THE NEIGHBORHOOD -- SKIP TO Q. 7      30-31
- 02[ ] LP GAS (BOTTLED OR TANK GAS) -- SKIP TO Q. 7
- 03[ ] FUEL OIL -- SKIP TO Q. 7
- 04[ ] KEROSENE OR COAL OIL -- SKIP TO Q. 7
- 05[ ] ELECTRICITY -- GO TO Q. 6
- 06[ ] COAL OR COKE -- SKIP TO Q. 8
- 07[ ] WOOD -- SKIP TO Q. 8
- 08[ ] SOLAR COLLECTORS -- SKIP TO Q. 10
- 21[ ] OTHER (SPECIFY): \_\_\_\_\_ SKIP TO Q. 9
- 00[ ] NO SPACE HEATING FUEL USED -- SKIP TO Q. 12

IF ELECTRICITY USED FOR HOME HEATING, ASK:

6. What was the main heating equipment? Was it built-in electric units, heat pump, central warm-air furnace, portable heaters, or what?

- 05[ ] BUILT-IN ELECTRIC UNITS
- 04[ ] HEAT PUMP(S)
- 03[ ] CENTRAL WARM AIR-FURNACE (WITH DUCTS)
- 10[ ] PORTABLE HEATERS
- 21[ ] OTHER (SPECIFY): \_\_\_\_\_

SKIP TO Q. 9

IF UNDERGROUND GAS, LP GAS, FUEL OIL, KEROSENE OR COAL OIL USED FOR HOME HEATING, ASK:

32-33

7. What was the main heating equipment? Was it radiant heating (hot water running through a slab floor), steam or hot water system with radiators, a central warm-air furnace, a floor, wall or pipeless furnace, room heaters, or what?

- 02[ ] HOT WATER PIPES IN SLAB FLOOR (RADIANT HEATING)
- 02[ ] STEAM OR HOT WATER SYSTEM WITH RADIATORS OR CONVECTORS
- 03[ ] CENTRAL WARM-AIR FURNACE (WITH DUCTS)
- 06[ ] FLOOR, WALL, OR PIPELESS FURNACE
- 07[ ] ROOM HEATERS BURNING GAS, OIL, KEROSENE (NON-PORTABLE)
- 21[ ] PORTABLE KEROSENE HEATER(S)
- 12[ ] COOKING STOVE, RANGE, OR OVEN (USED TO HEAT HOME, AS WELL AS FOR COOKING)
- 21[ ] OTHER (SPECIFY): \_\_\_\_\_

SKIP TO Q. 9

IF WOOD, COAL, OR COKE USED FOR HOME HEATING, ASK:

8. What was the main heating equipment? Was it a steam or hot water system with radiators, a heating stove, a fireplace, or what?

- 02[ ] STEAM OR HOT WATER SYSTEM WITH RADIATORS OR CONVECTORS
- 08[ ] HEATING STOVE
- 09[ ] FIREPLACE(S)
- 21[ ] OTHER (SPECIFY): \_\_\_\_\_

9. As of November 1987, was the main heating fuel paid for by the tenant or by the landlord?

- 1 [ ] TENANT
- 2 [ ] LANDLORD
- 5 [ ] OTHER (SPECIFY): \_\_\_\_\_

34

10. You say that (SEE Q. 5) was the main fuel used for home heating. Was any other fuel used for heating at this apartment?  YES  NO -- SKIP TO Q. 12

35

**IF "YES," ASK:**

11. What was the other fuel used?

- 01 GAS FROM UNDERGROUND PIPES
- 02 LP GAS (BOTTLED OR TANK GAS)
- 03 FUEL OIL
- 04 KEROSENE OR COAL OIL
- 05 ELECTRICITY
- 06 COAL OR COKE
- 07 WOOD
- 08 SOLAR COLLECTORS
- 21 OTHER (SPECIFY): \_\_\_\_\_

36-37

12. As of November 1987, what was the main fuel used for heating water?

- 01 GAS FROM UNDERGROUND PIPES
- 02 LP GAS (BOTTLED OR TANK GAS)
- 03 FUEL OIL
- 04 KEROSENE OR COAL OIL
- 05 ELECTRICITY
- 06 COAL OR COKE
- 07 WOOD
- 08 SOLAR COLLECTORS
- 21 OTHER (SPECIFY): \_\_\_\_\_

38-39

 00 NO WATER HEATING FUEL -- SKIP TO Q. 14

13. Was the main water heating fuel paid for by the tenant or by the landlord?

- 1 TENANT
- 2 LANDLORD
- 5 OTHER (SPECIFY): \_\_\_\_\_

40

14. As of November 1987, what was the main fuel used for cooking?

- 01 GAS FROM UNDERGROUND PIPES
- 02 LP GAS (BOTTLED OR TANK GAS)
- 03 FUEL OIL
- 04 KEROSENE OR COAL OIL
- 05 ELECTRICITY
- 06 COAL OR COKE
- 07 WOOD
- 21 OTHER (SPECIFY): \_\_\_\_\_

42-42

 00 NO COOKING EQUIPMENT -- SKIP TO Q. 16

15. Was the main cooking fuel paid for by the tenant or by the landlord?

- 1 TENANT
- 2 LANDLORD
- 5 OTHER (SPECIFY): \_\_\_\_\_

43

16. Last summer (1987), did the (apartment/other unit) have air conditioning, either from a central system for the whole building or housing unit, or from individual window or wall units? (MARK ALL THAT APPLY.)
- [ ] YES, CENTRAL SYSTEM -- ASK QS. 17 & 18      44  
 [ ] YES, INDIVIDUAL (WINDOW/WALL)  
       UNITS -- SKIP TO Q. 19      45  
 [ ] NO -- SKIP TO Q. 20

IF CENTRAL SYSTEM AIR CONDITIONING, ASK:

17. Did the central air-conditioning system use gas from underground pipes, LPG, or electricity?
- 1 [ ] GAS FROM UNDERGROUND PIPES  
 2 [ ] LP GAS (BOTTLED OR TANK GAS)      46  
 3 [ ] ELECTRICITY
18. Was the air-conditioning fuel paid for by the tenant or by the landlord?
- 1 [ ] TENANT  
 2 [ ] LANDLORD  
 5 [ ] OTHER (SPECIFY): \_\_\_\_\_ 47

IF WINDOW AIR CONDITIONING, ASK:

19. Was the air conditioning paid for by the tenant or the landlord?
- 1 [ ] TENANT  
 2 [ ] LANDLORD  
 5 [ ] OTHER (SPECIFY): \_\_\_\_\_ 48
20. Was electricity for lighting within the apartment paid for by the tenant or by the landlord?
- 1 [ ] TENANT  
 2 [ ] LANDLORD  
 5 [ ] OTHER (SPECIFY): \_\_\_\_\_ 49

IF OTHER UNITS ARE ON CONTROL CARD LIST, ASK ABOUT NEXT UNIT WITH NEXT QUESTIONNAIRE.

IF NOT --

Thank you very much for your time and help. We may be in touch with you again. Have a nice day!

NAME OF PERSON INTERVIEWED: \_\_\_\_\_

TITLE OR RELATION TO  
RENTAL AGENT: \_\_\_\_\_

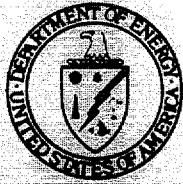
INTERVIEWER: \_\_\_\_\_

TIME COMPLETED: \_\_\_\_\_ AM PM

DATE COMPLETED: \_\_\_\_\_ 51-54

LENGTH OF INTERVIEW: \_\_\_\_\_ MINUTES 56-57

OMB NO. 1905-0092  
(Expires 5/31/90)  
EIA-457D  
F4918-13



**U.S. DEPARTMENT OF ENERGY**  
**1987 RESIDENTIAL ENERGY CONSUMPTION SURVEY**

Conducted by  
**RESPONSE ANALYSIS CORPORATION**  
377 Wall Street  
P.O. Box 158  
Princeton, New Jersey 08542

**LIQUEFIED PETROLEUM GAS (LP-GAS)**

These data will be combined with similar data throughout the country to show the use of LP-Gas in U.S. homes. Information about specific households will be kept strictly confidential.

This research is being conducted by Response Analysis Corporation under U.S. Department of Energy Contract Number DE-AC01-85EI19693. This survey is mandatory as authorized by the Federal Energy Administration Act of 1974 (Public Law 93-275), as amended. Late filing, failure to keep records, or failure otherwise to comply with these instructions may result in criminal fines, civil penalties, and other sanctions as provided by law.

HOUSEHOLD:

If you have any questions, please  
call collect to Ms. Arlene Shipley  
at (609) 921-3333.

LIQUEFIED PETROLEUM GAS USAGE

Please provide information on all deliveries to this household from October 1, 1986 to the present date. If information is available only for a shorter period, just report deliveries for that shorter period.

| Del.<br># | Date of Delivery | Column 1       | Column 2                                    | Column 3              | Column 4          | Column 5                |
|-----------|------------------|----------------|---|-----------------------|-------------------|-------------------------|
|           |                  | Fuel Sold Was: | Propane    P<br>Butane    B<br>Other      0 | Quantity<br>Delivered | Price per<br>Unit | Total Dollar<br>Amount* |
| 1         |                  | P    B    0    |   |                       |                   |                         |
| 2         |                  | P    B    0    |   |                       |                   |                         |
| 3         |                  | P    B    0    |   |                       |                   |                         |
| 4         |                  | P    B    0    |   |                       |                   |                         |
| 5         |                  | P    B    0    |   |                       |                   |                         |
| 6         |                  | P    B    0    |   |                       |                   |                         |
| 7         |                  | P    B    0    |   |                       |                   |                         |
| 8         |                  | P    B    0    |   |                       |                   |                         |
| 9         |                  | P    B    0    |   |                       |                   |                         |
| 10        |                  | P    B    0    |   |                       |                   |                         |
| 11        |                  | P    B    0    |   |                       |                   |                         |
| 12        |                  | P    B    0    |   |                       |                   |                         |
| 13        |                  | P    B    0    |   |                       |                   |                         |
| 14        |                  | P    B    0    |   |                       |                   |                         |
| 15        |                  | P    B    0    |   |                       |                   |                         |
| 16        |                  | P    B    0    |   |                       |                   |                         |
| 17        |                  | P    B    0    |   |                       |                   |                         |
| 18        |                  | P    B    0    |   |                       |                   |                         |

PLEASE CONTINUE ON PAGE 4 IF NECESSARY.

\*Please include state and local sales taxes, where applicable. Exclude merchandise, repairs, or service charges.

LIQUEFIED PETROLEUM GAS (LPG)

1. If "Other" has been circled for type of fuel in Column 2 (page 2 or page 4), please specify what fuel was sold: \_\_\_\_\_

2. Please mark unit of measure for deliveries reported on page 2.

- POUNDS       CUBIC METERS  
 GALLONS       DECITHERMS  
 CUBIC FEET       OTHER (Please specify): \_\_\_\_\_

3. What is the capacity of this household's storage tank(s)?

Capacity is \_\_\_\_\_ and is measured in number of:

- POUNDS  
 GALLONS  
 OTHER UNIT (Please specify): \_\_\_\_\_

4. Were you supplying this household on October 1, 1986?

YES       NO → IF "NO," approximately when did this household become a customer of your company?

APPROXIMATE DATE \_\_\_\_\_

- DON'T KNOW  
 NEVER A CUSTOMER

5. Is this household currently your customer?

YES       NO → IF "NO," approximately when did this household stop being a customer of your company?

APPROXIMATE DATE \_\_\_\_\_

- DON'T KNOW  
 NEVER A CUSTOMER

6. The information reported here is from:

- COMPANY RECORDS  
 AN ESTIMATE MADE BY A COMPANY REPRESENTATIVE  
 INFORMATION SECURED FROM THE CUSTOMER

7. This information has been supplied by:

(Name) \_\_\_\_\_ (Company) \_\_\_\_\_ (Telephone) \_\_\_\_\_ (Date) \_\_\_\_\_

| FOR OFFICE USE ONLY    |              |                         |          |                         |              |           |          |                        |              |          |          |                    |            |               |             |               |
|------------------------|--------------|-------------------------|----------|-------------------------|--------------|-----------|----------|------------------------|--------------|----------|----------|--------------------|------------|---------------|-------------|---------------|
| CARD<br>7-8            | FUEL<br>9    | BEGINNING DATE<br>11-16 |          | ENDING DATE<br>17-22    |              | CR?<br>23 | 24       | 25                     | 26           | 27       | 28       | 29                 | CR/E<br>30 | TANK<br>31-34 | UNITS<br>37 | TPRs<br>38-39 |
| 40                     | 3            |                         |          |                         |              |           |          |                        |              |          |          |                    |            |               |             |               |
| FIRST COMPANY<br>41-45 | PRs<br>46-47 | FT<br>48                | DC<br>49 | SECOND COMPANY<br>51-55 | PRs<br>56-57 | FT<br>58  | DC<br>59 | THIRD COMPANY<br>61-65 | PRs<br>66-67 | FT<br>68 | DC<br>69 | SUPPLIERS<br>71-72 |            |               |             |               |
|                        |              |                         |          |                         |              |           |          |                        |              |          |          |                    |            |               |             |               |

LIQUEFIED PETROLEUM GAS (LPG)

| Del.<br># | Date of Delivery | Column 1     | Column 2<br>Fuel Sold Was: | Column 3          | Column 4                | Column 5 |
|-----------|------------------|--------------|----------------------------|-------------------|-------------------------|----------|
|           |                  | (Circle one) | Quantity<br>Delivered      | Price per<br>Unit | Total Dollar<br>Amount* |          |
| 19        |                  | P B O        |                            |                   |                         |          |
| 20        |                  | P B O        |                            |                   |                         |          |
| 21        |                  | P B O        |                            |                   |                         |          |
| 22        |                  | P B O        |                            |                   |                         |          |
| 23        |                  | P B O        |                            |                   |                         |          |
| 24        |                  | P B O        |                            |                   |                         |          |
| 25        |                  | P B O        |                            |                   |                         |          |
| 26        |                  | P B O        |                            |                   |                         |          |
| 27        |                  | P B O        |                            |                   |                         |          |
| 28        |                  | P B C        |                            |                   |                         |          |
| 29        |                  | P B O        |                            |                   |                         |          |
| 30        |                  | P B O        |                            |                   |                         |          |

\*Please include state and local sales taxes, where applicable. Exclude merchandise, repairs, or service charges.  
 PLEASE USE THIS SPACE FOR ANY ADDITIONAL NOTES THAT YOU WISH TO MAKE TO EXPLAIN ENTRIES ON THIS FORM.

PLEASE CHECK THAT THE QUESTIONS ON PAGE THREE HAVE BEEN ANSWERED.



U.S. DEPARTMENT OF ENERGY  
1987 RESIDENTIAL ENERGY CONSUMPTION SURVEY

Conducted by  
RESPONSE ANALYSIS CORPORATION,  
P.O. Box 158, Princeton, New Jersey 08542.  
Mandatory under Public Law 93-273 as amended.

OMB No. 1905-0092  
(Expires 5/31/90)  
EIA-457E  
F4918-10

HOUSEHOLD:

If the customer account number is not shown, please enter it.

If you have any questions, please call collect to Ms. Arlene Shipley  
(609) 921-3333.

CUSTOMER  
ACCOUNT #:

Information about specific households will be kept strictly confidential.

ELECTRICITY USAGE FROM DECEMBER 1, 1986 TO THE PRESENT

| Time Period | Consumption Period |             | Number of KWh Used | (Circle One) |               |                      | Total Dollar* Amount |
|-------------|--------------------|-------------|--------------------|--------------|---------------|----------------------|----------------------|
|             | Beginning Date     | Ending Date |                    | A - Actual   | E - Estimates | R - Read by Customer |                      |
| 1           |                    |             |                    | A            | E             | R                    |                      |
| 2           |                    |             |                    | A            | E             | R                    |                      |
| 3           |                    |             |                    | A            | E             | R                    |                      |
| 4           |                    |             |                    | A            | E             | R                    |                      |
| 5           |                    |             |                    | A            | E             | R                    |                      |
| 6           |                    |             |                    | A            | E             | R                    |                      |
| 7           |                    |             |                    | A            | E             | R                    |                      |
| 8           |                    |             |                    | A            | E             | R                    |                      |
| 9           |                    |             |                    | A            | E             | R                    |                      |
| 10          |                    |             |                    | A            | E             | R                    |                      |
| 11          |                    |             |                    | A            | E             | R                    |                      |
| 12          |                    |             |                    | A            | E             | R                    |                      |
| 13          |                    |             |                    | A            | E             | R                    |                      |
| 14          |                    |             |                    | A            | E             | R                    |                      |
| 15          |                    |             |                    | A            | E             | R                    |                      |
| 16          |                    |             |                    | A            | E             | R                    |                      |
| 17          |                    |             |                    | A            | E             | R                    |                      |
| 18          |                    |             |                    | A            | E             | R                    |                      |

\*Please include state and local taxes. Exclude merchandise, repair, and service charges. If the household is on the budget plan, do not provide the budgeted bill; provide instead the dollar amount that is the cost of the actual consumption in the period.

Form completed by: \_\_\_\_\_  
(Name) \_\_\_\_\_ (Telephone Number) \_\_\_\_\_ (Date) \_\_\_\_\_



U.S. DEPARTMENT OF ENERGY  
1987 RESIDENTIAL ENERGY CONSUMPTION SURVEY

OMB NO. 1905-0092  
(Expires 5/31/90)  
EIA-457F  
F491B-11

Conducted by

RESPONSE ANALYSIS CORPORATION  
P.O. Box 158, Princeton, New Jersey 08542  
Mandatory under Public Law 93-275 as amended.

HOUSEHOLD:

If the customer account number is not shown, please enter it.

If you have any questions, please call collect to Ms. Arlene Shipley (609) 921-3333.

CUSTOMER  
ACCOUNT #:

Information about specific households will be kept strictly confidential.

UTILITY GAS USAGE FROM DECEMBER 1, 1986 TO THE PRESENT

| Time Period | Consumption Period |             | Quantity Used* | (Circle One)<br>Quantities are:<br>A - Actual<br>E - Estimates<br>R - Read by Customer | Total Dollar* Amount |
|-------------|--------------------|-------------|----------------|--|----------------------|
|             | Beginning Date     | Ending Date |                |  |                      |
| 1           |                    |             |                | A E R  |                      |
| 2           |                    |             |                | A E R  |                      |
| 3           |                    |             |                | A E R  |                      |
| 4           |                    |             |                | A E R  |                      |
| 5           |                    |             |                | A E R  |                      |
| 6           |                    |             |                | A E R  |                      |
| 7           |                    |             |                | A E R  |                      |
| 8           |                    |             |                | A E R  |                      |
| 9           |                    |             |                | A E R  |                      |
| 10          |                    |             |                | A E R  |                      |
| 11          |                    |             |                | A E R  |                      |
| 12          |                    |             |                | A E R  |                      |
| 13          |                    |             |                | A E R  |                      |
| 14          |                    |             |                | A E R  |                      |
| 15          |                    |             |                | A E R  |                      |
| 16          |                    |             |                | A E R  |                      |
| 17          |                    |             |                | A E R  |                      |
| 18          |                    |             |                | A E R  |                      |

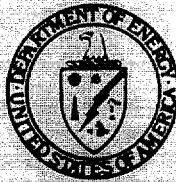
\*The quantity used is expressed in terms of: (Mark one)

- Therms  
 Cubic Feet  
 Hundreds of Cubic Feet (CCF)  
 Thousands of Cubic Feet (MCF)  
 Other (Please specify): \_\_\_\_\_

\*\*Please include state and local taxes. Exclude merchandise, repairs, and service charges. If the household is on the budget plan, do not provide the budgeted bill; provide instead the dollar amount that is the cost of the actual consumption in the period.

Form completed by: \_\_\_\_\_ (Name) \_\_\_\_\_ - (Telephone Number) \_\_\_\_\_ (Date)

OMB NO. 1905-0092  
(Expires 5/31/90)  
EIA-457G  
F4918-12



**U.S. DEPARTMENT OF ENERGY**  
**1987 RESIDENTIAL ENERGY CONSUMPTION SURVEY**

Conducted by  
RESPONSE ANALYSIS CORPORATION  
377 Wall Street  
P.O. Box 158  
Princeton, New Jersey 08542

**FUEL OIL OR KEROSENE**

These data will be combined with similar data throughout the country to show the use of fuel oil or kerosene in U.S. homes. Information about specific households will be kept strictly confidential.

This research is being conducted by Response Analysis Corporation under U.S. Department of Energy Contract Number DE-AC01-85EI19693. This survey is mandatory as authorized by the Federal Energy Administration Act of 1974 (Public Law 93-275), as amended. Late filing, failure to keep records, or failure otherwise to comply with these instructions may result in criminal fines, civil penalties, and other sanctions as provided by law.

HOUSEHOLD:

If you have any questions, please  
call collect to Ms. Arlene Shipley  
at (609) 921-3333.

FUEL OIL AND KEROSENE USAGE

Please provide information on all deliveries to this household from October 1, 1986 to the present date. If information is available only for a shorter period, just report deliveries for that shorter period.

| Del.<br># | Column 1<br><br>Date of Delivery | Column 2<br><br>Fuel Sold Was:<br><br>Fuel oil #1 (1)<br>Fuel oil #2 (2)<br>Kerosene (K)<br>Other (O)<br><br>(Circle one) | Column 3<br><br>Gallons<br>Delivered | Column 4<br><br>Price per<br>Gallon | Column 5<br><br>Total Dollar<br>Amount* |
|-----------|----------------------------------|---|--------------------------------------|-------------------------------------|---|
|           |                                  |   |                                      |                                     |   |
| 1         |                                  | 1 2 K 0   |                                      |                                     |   |
| 2         |                                  | 1 2 K 0   |                                      |                                     |   |
| 3         |                                  | 1 2 K 0   |                                      |                                     |   |
| 4         |                                  | 1 2 K 0   |                                      |                                     |   |
| 5         |                                  | 1 2 K 0   |                                      |                                     |   |
| 6         |                                  | 1 2 K 0   |                                      |                                     |   |
| 7         |                                  | 1 2 K 0   |                                      |                                     |   |
| 8         |                                  | 1 2 K 0   |                                      |                                     |   |
| 9         |                                  | 1 2 K 0   |                                      |                                     |   |
| 10        |                                  | 1 2 K 0   |                                      |                                     |   |
| 11        |                                  | 1 2 K 0   |                                      |                                     |   |
| 12        |                                  | 1 2 K 0   |                                      |                                     |   |
| 13        |                                  | 1 2 K 0   |                                      |                                     |   |
| 14        |                                  | 1 2 K 0   |                                      |                                     |   |
| 15        |                                  | 1 2 K 0   |                                      |                                     |   |
| 16        |                                  | 1 2 K 0   |                                      |                                     |   |
| 17        |                                  | 1 2 K 0   |                                      |                                     |   |
| 18        |                                  | 1 2 K 0   |                                      |                                     |   |

PLEASE CONTINUE ON PAGE 4 IF NECESSARY.

\*Please include state and local sales taxes, where applicable. Exclude merchandise, repairs, or service charges.

**FUEL OIL AND KEROSENE**

1. If "Other" has been circled for type of fuel in Column 2 (page 2 or page 4), please specify what fuel was sold:

---

2. What is the capacity of this household's storage tank? CAPACITY: \_\_\_\_\_ GALLONS

3. Was this household your customer as of October 1, 1986?

YES       NO

IF "NO," approximately when did this household become a customer of your company?

APPROXIMATE DATE: \_\_\_\_\_

DON'T KNOW

NEVER A CUSTOMER

4. Is this household currently your customer?

YES       NO

IF "NO," approximately when did this household stop being a customer of your company?

APPROXIMATE DATE: \_\_\_\_\_

DON'T KNOW

NEVER A CUSTOMER

5. The information presented here is from:

COMPANY RECORDS

AN ESTIMATE MADE BY A COMPANY REPRESENTATIVE

INFORMATION SECURED FROM THE CUSTOMER

6. This information has been supplied by:

\_\_\_\_\_  
(Name)                          (Company)                          (Telephone)                          Date)

| FOR OFFICE USE ONLY    |              |                         |          |                         |                      |          |          |                        |              |          |              |                    |    |    |            |               |               |
|------------------------|--------------|-------------------------|----------|-------------------------|----------------------|----------|----------|------------------------|--------------|----------|--------------|--------------------|----|----|------------|---------------|---------------|
| CARD<br>7-9            | FUEL<br>9    | BEGINNING DATE<br>11-16 |          |                         | ENDING DATE<br>17-22 |          |          | CR/<br>23              | 24           | 25       | REASON<br>26 | 27                 | 28 | 29 | CR/E<br>30 | TANK<br>31-34 | TPRs<br>38-39 |
| 60                     | 4            |                         |          |                         |                      |          |          |                        |              |          |              |                    |    |    |            |               |               |
| FIRST COMPANY<br>41-45 | PRS<br>46-47 | FT<br>48                | DC<br>49 | SECOND COMPANY<br>51-55 | PRS<br>56-57         | FT<br>58 | DC<br>59 | THIRD COMPANY<br>61-65 | PRS<br>66-67 | FT<br>68 | DC<br>69     | SUPPLIERS<br>71-72 |    |    |            |               |               |
|                        |              |                         |          |                         |                      |          |          |                        |              |          |              |                    |    |    |            |               |               |

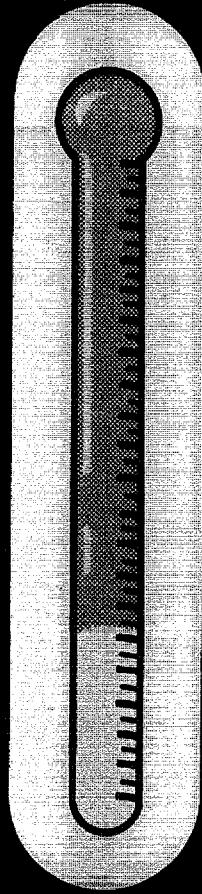
FUEL OIL AND KEROSENE

| Del.<br># | Date of Delivery | Column 2<br>Fuel Sold Was: | Column 3             | Column 4            | Column 5                |
|-----------|------------------|----------------------------|----------------------|---------------------|-------------------------|
|           |                  | (Circle one)               | Gallons<br>Delivered | Price per<br>Gallon | Total Dollar<br>Amount* |
| 19        |                  | 1 2 K 0                    |                      |                     |                         |
| 20        |                  | 1 2 K 0                    |                      |                     |                         |
| 21        |                  | 1 2 K 0                    |                      |                     |                         |
| 22        |                  | 1 2 K 0                    |                      |                     |                         |
| 23        |                  | 1 2 K 0                    |                      |                     |                         |
| 24        |                  | 1 2 K 0                    |                      |                     |                         |
| 25        |                  | 1 2 K 0                    |                      |                     |                         |
| 26        |                  | 1 2 K 0                    |                      |                     |                         |
| 27        |                  | 1 2 K 0                    |                      |                     |                         |
| 28        |                  | 1 2 K 0                    |                      |                     |                         |
| 29        |                  | 1 2 K 0                    |                      |                     |                         |
| 30        |                  | 1 2 K 0                    |                      |                     |                         |

\*Please include state and local sales taxes, where applicable. Exclude merchandise, repairs, or service charges.

PLEASE USE THIS SPACE FOR ANY ADDITIONAL NOTES THAT YOU WISH TO MAKE TO EXPLAIN ENTRIES ON THIS FORM.

PLEASE CHECK THAT THE QUESTIONS ON PAGE THREE HAVE BEEN ANSWERED.



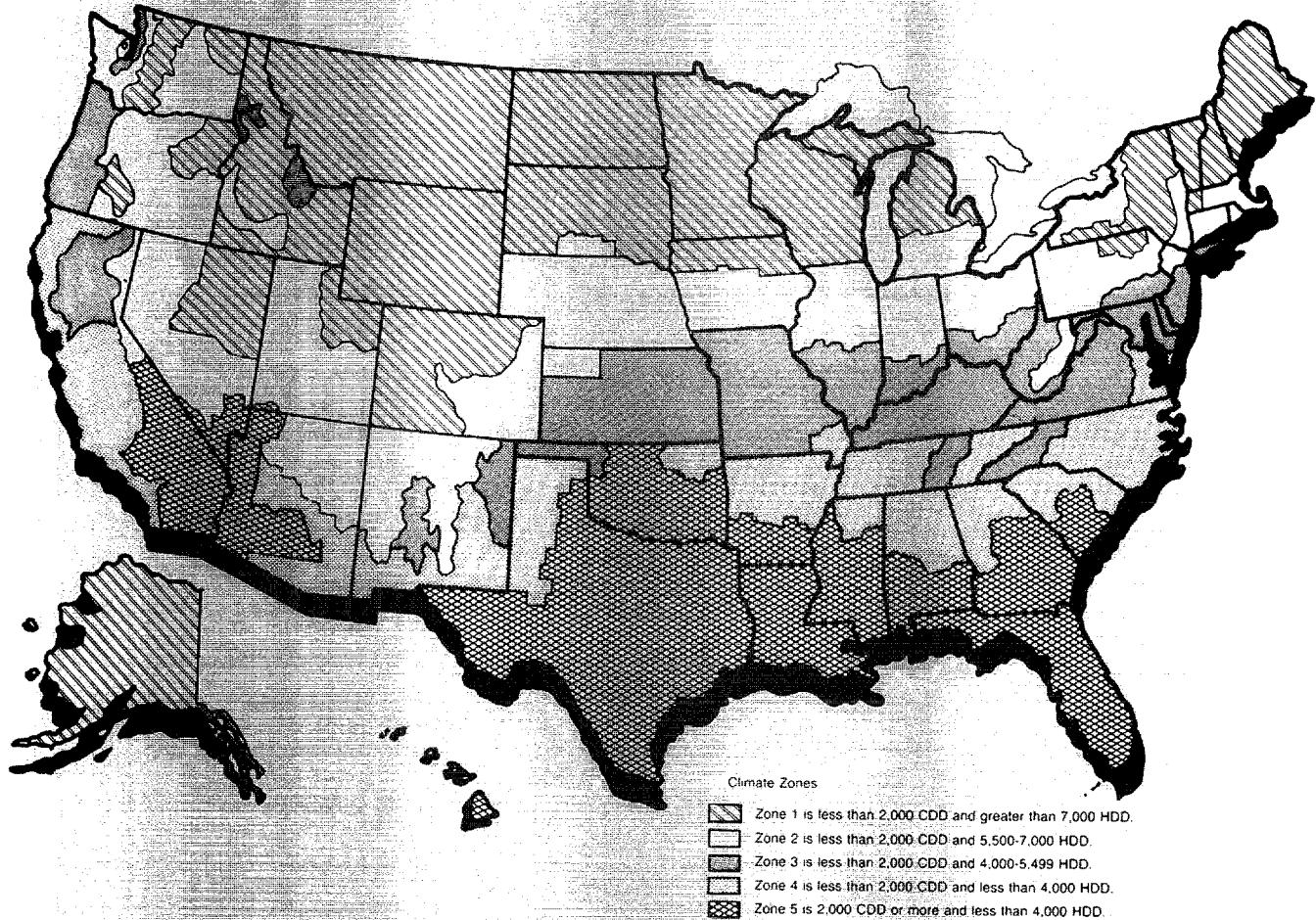
U.S. Climate  
Zone Map

**Appendix E**



## Appendix E

### U.S. Climate Zone Map





## Appendix F

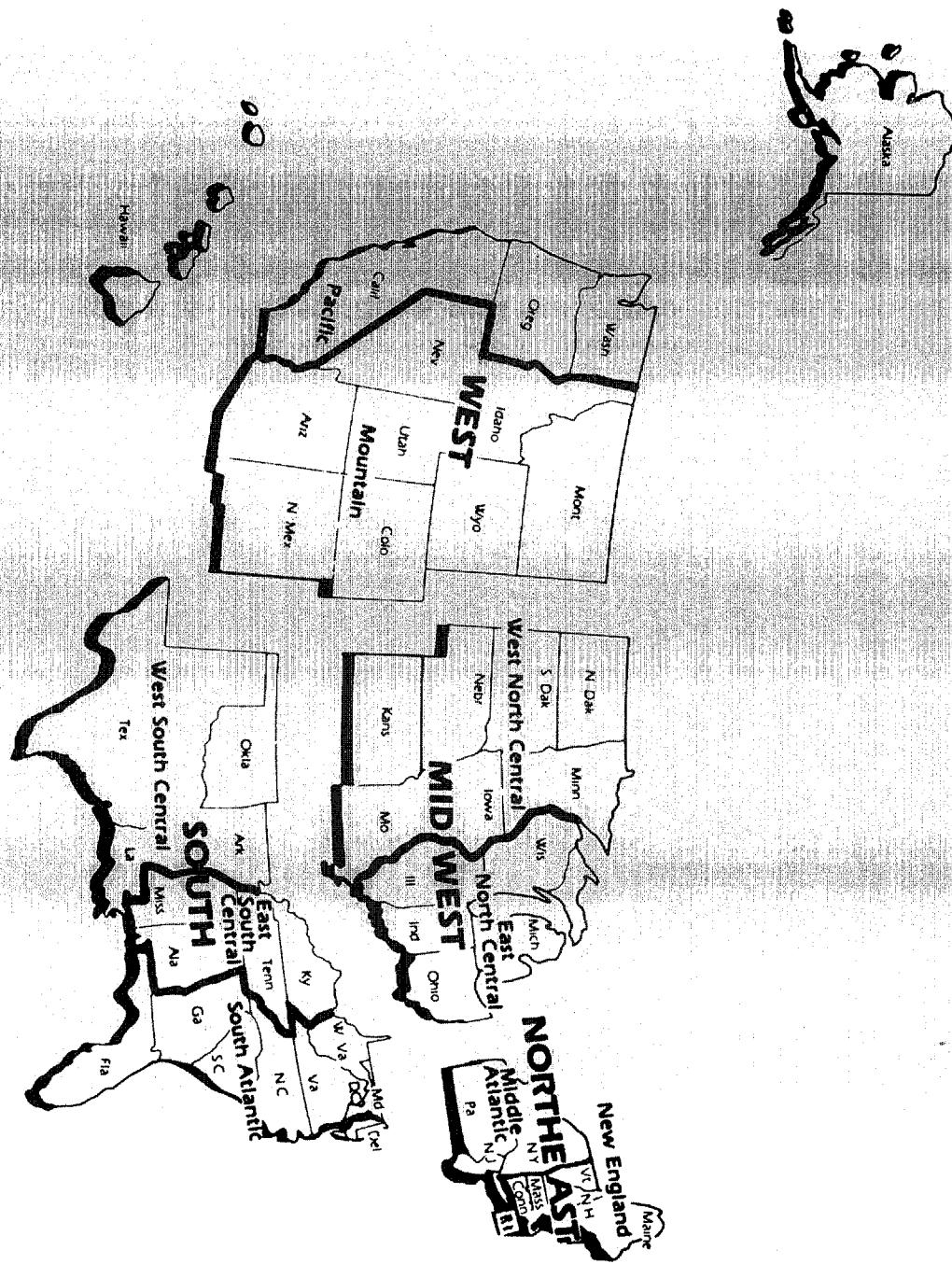
### U.S. Census Regions and Divisions





## Appendix F

### U.S. Census Regions and Divisions





## **Appendix G**

### **Related EIA Publications on Energy Consumption**





## Appendix G

# Related EIA Publications on Energy Consumption

These publications are available from the National Energy Information Center or the Superintendent of Documents. See the inside cover of this report on how to obtain copies of these publications. Please note that the prices quoted are subject to change.

In addition to the reports listed below, public use data tapes for the residential, residential transportation and commercial sectors are available from the National Technical Information Service (NTIS). To obtain information on how to order tapes, you may call NTIS at 703/487-4807.

## Residential Sector

### Housing Characteristics

*Housing Characteristics 1987:* May 1989, DOE/EIA-0314(87), GPO Stock No. 061-003-00619-1, \$13.00.

*Residential Energy Consumption Survey: Housing Characteristics 1984:* October 1986, DOE/EIA-0314(84), GPO Stock No. 061-003-00499-7, \$12.00.

*Residential Energy Consumption Survey: Housing Characteristics, 1982:* August 1984, DOE/EIA-0314(82), GPO Stock No. 061-003-00393-1, \$7.00.

*Residential Energy Consumption Survey: Housing Characteristics, 1981:* August 1983, DOE/EIA-0314(81), GPO Stock No. 061-003-00330-3, \$6.50.

*Residential Energy Consumption Survey: Housing Characteristics, 1980:* June 1982, DOE/EIA-0314, GPO Stock No. 061-003-00256-1, \$11.00.

*Residential Energy Consumption Survey: Characteristics of the Housing Stock and Households, 1978:* February 1980, DOE/EIA-0207/2, GPO Stock No. 061-003-00093-2, \$4.25.

*Residential Energy Consumption Survey: Conservation;* February 1980, DOE/EIA-0207/3, GPO Stock No. 061-003-00087-8, \$6.00.

*Preliminary Conservation Tables from the National Interim Energy Consumption Survey;* August 1979, DOE/EIA-0193/P (no GPO Stock No.).

*Characteristics of the Housing Stock and Households: Preliminary Findings from the National Interim Energy Consumption Survey;* October 1979, DOE/EIA-0199/P (no GPO Stock No.).

### Consumption and Expenditures

*Household Energy Consumption and Expenditures 1987, Part 1: National Data;* October 1989, DOE/EIA-0321/1(87).

*Residential Energy Consumption Survey: Consumption and Expenditures, April 1984 Through March 1985, Part 1: National Data;* March 1987, DOE/EIA-0321/1(84), GPO Stock No. 061-003-00519-5, \$9.50.

*Residential Energy Consumption Survey: Consumption and Expenditures, April 1984 Through March 1985, Part 2: Regional Data;* May 1987, DOE/EIA-0321/2(84), GPO Stock No. 061-003-00528-4, \$17.00.

*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.

*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 I: 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

*End-Use Consumption of Residential Energy* (Article), pp. vii-xiv, *Monthly Energy Review*, July 1987, DOE/EIA-0035(87/07).

*Residential Energy Consumption Survey: Trends in Consumption and Expenditures 1978-1984* June 1987, DOE/EIA-0482, GPO Stock No. 061-003-00535-7, \$12.00.

*Residential Conservation Measures;* July 1986, SR/EEUD/86/01 (no GPO Stock No.).

*An Economic Evaluation of Energy Conservation and Renewable Energy Tax Credits;* October 1985, Service Report (no GPO Stock No.).

*Residential Energy Consumption and Expenditures by End Use for 1978, 1980, and 1981;* December 1984, DOE/EIA-0458, GPO Stock No. 061-003-00415-6, \$4.50.

*Weatherization Program Evaluation, SR-EEUD-84-1;* August 1984 (available from the Office of the Assistant Secretary for Conservation and Renewable Energy, Department of Energy).

*Residential Energy Consumption Survey: Regression Analysis of Energy Consumption by End Use;* October 1983, DOE/EIA-0431, GPO Stock No. 061-003-00347-8, \$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.).

## 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, 1986;* September 1988, DOE/EIA-0246(86), GPO Stock No. 061-003-00580-2, \$16.00.

*Nonresidential Buildings Energy Consumption Survey: Characteristics of Commercial Buildings, 1983;* July 1985, DOE/EIA-0246(83), GPO Stock No. 061-003-00439-3, \$7.50.

*Nonresidential Buildings Energy Consumption Survey: Characteristics of Commercial Buildings, 1983; A Supplemental Reference,* DOE/EIA-M008, \$22.95. Available from the National Technical Information Service (NTIS), Order No. DE-85015581.

*Nonresidential Buildings Energy Consumption Survey: Fuel Characteristics and Conservation Practices;* June 1981, DOE/EIA-0278, GPO Stock No. 061-003-00200-5, \$9.00.

*Nonresidential Buildings Energy Consumption Survey: Building Characteristics;* March 1981, DOE/EIA-0246, GPO Stock No. 061-003-00171-8, \$6.50.

### **Consumption and Expenditures**

*Nonresidential Buildings Energy Consumption Survey: Commercial Buildings Consumption and Expenditures 1986;* May 1989, DOE/EIA-0318(86), GPO Stock No. 061-003-00613-2, \$19.00.

*Nonresidential Buildings Energy Consumption Survey: Commercial Buildings, Consumption and Expenditures 1983;* September 1986, DOE/EIA-0318(83), GPO Stock No. 061-003-00496-2, \$13.00.

*Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures, Part 1: Natural Gas and Electricity;* March 1983, DOE/EIA-0318/1, GPO Stock No. 061-003-00298-6, \$9.50.

*Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures, Part 2: Steam, Coal, Fuel Oil, LPG, and Total Fuels;* December 1983, DOE/EIA-0318(79)/2, GPO Stock No. 061-003-00366-4, \$6.00.

## **Industrial Sector**

*Manufacturing Energy Consumption Survey: Fuel Switching Capability, 1985;* December 1988, DOE/EIA-0515(85), GPO Stock No. 061-003-00601-9, \$3.50.

*Manufacturing Energy Consumption Survey: Methodological Report, 1985;* November 1988, DOE/EIA-0514(85), GPO Stock No. 061-003-00595-1, \$6.00.

*Manufacturing Energy Consumption Survey: Consumption of Energy, 1985;* November 1988, DOE/EIA-0512(85), GPO Stock No. 061-003-00594-2, \$6.00.

*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.

## **Planned Publications for 1989**

*Household Energy Consumption and Expenditures 1987, Part 2: Regional Data;* planned for Nov. 1989.

*Household Vehicles Energy Consumption 1988;* planned for Dec. 1989.

*Manufacturing Energy Consumption Survey: Energy Efficiency in Manufacturing, 1985;* planned for Dec. 1989.

## **Public Use Tapes**

### **Residential and Residential Transportation Sectors**

*Residential Energy Consumption Survey: 1984 and Residential Transportation Energy Consumption Survey, 1985; Order No. PB87-186540/HAA.*

*Residential Energy Consumption Survey: 1982 and Residential Transportation Energy Consumption Survey, 1983; Order No. PB85-221760/HAA.*

*Residential Energy Consumption Survey: Housing Characteristics, 1981; Consumption and Expenditures, 1981-1982; Monthly Billing Data; Order No. PB84-120476/HAA.*

*Residential Energy Consumption Survey: Consumption and Expenditures, 1980-1981; Monthly Billing Data; Order No. PB84-166230/HAA.*

*Residential Energy Consumption Survey: Housing Characteristics, Annualized Consumption and Expenditures, 1980-1981; Order No. PB83-199554/HAA.*

*Residential Energy Consumption Survey: Household Transportation Panel Monthly Gas Purchases and Vehicle and Household Characteristics, 6/79-9/81; Order No. PB84-162452/HAA.*

*Residential Energy Consumption Survey: Household Screener Survey, 1979-1980; Order No. PB82-114877/HAA.*

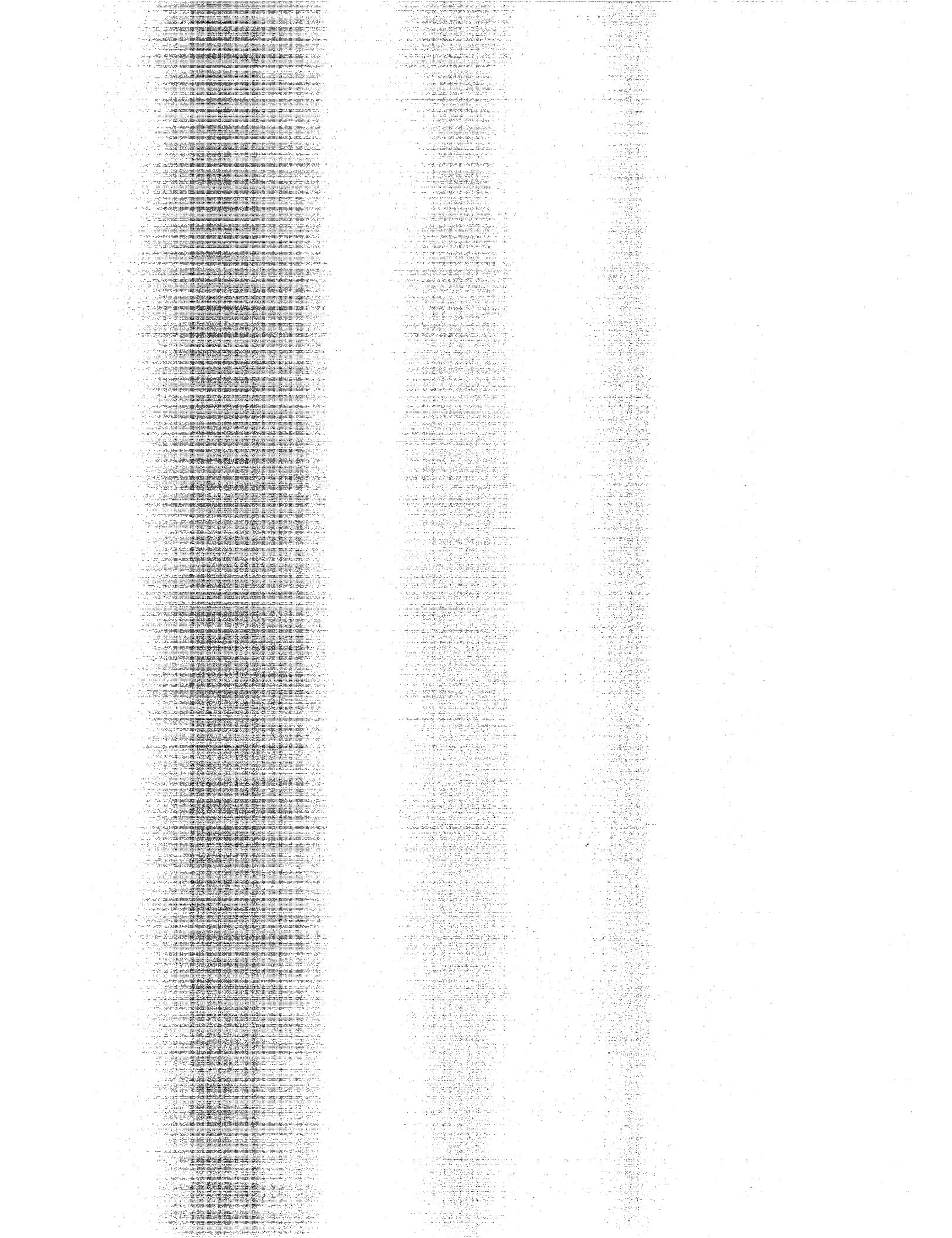
*Residential Energy Consumption Survey: Household Monthly Energy Consumption and Expenditures, 1978-1979; Order No. PB82-114901/HAA.*

*National Interim Energy Consumption Survey (Residential), 1978; Order No. PB81-108714/HAA.*

### **Commercial Sector**

*Nonresidential Buildings Energy Consumption Survey: 1986 Data; Planned for September 1989.*

*Nonresidential Buildings Energy Consumption Survey: 1979 and 1983 Data; Order No. PB88-245162.*





## Glossary

**Active Solar:** As an energy source, energy from the sun collected and stored using mechanical pumps or fans to circulate heat-laden fluids or air between solar collectors and housing unit. Examples include the use of solar collectors for water or space heating. Data on the passive collection of solar energy, such as by trombe walls, were not collected on the 1987 RECS.

**Adjusted Electricity:** A measurement of electricity that includes the approximate amount of energy used to generate electricity. To approximate the adjusted amount of electricity, the site-value of the electricity is multiplied by a factor of three. This conversion factor of 3 is a rough approximation of the Btu value of raw fuels used to generate electricity in a steam-generation power plant. In this report, electricity is represented as site energy. See **Site Energy** and **Btu Conversion Factors**.

**Aggregate Ratio:** The ratio of two population aggregates (totals). For example, the aggregate expenditures per household is the ratio of the total expenditures in each category to the total number of households in the category. See **Mean**.

**Air-Conditioned Rooms:** The number of rooms the air-conditioning equipment is capable of cooling when the equipment is used. The question "How many rooms in your house/apartment can be cooled by your air conditioning?" refers to rooms that could be cooled if the air-conditioning equipment were used. There are no cases in the RECS data set of households with air-conditioning equipment that cooled zero rooms, but there are cases that have zero end-use energy for air conditioning because they did not use their air-conditioning equipment. See **Air-Conditioning Equipment**.

**Air Conditioning:** Air conditioning is one of four main end-use categories in this report. It is defined as the use of energy to cool the air in a housing unit by a refrigeration unit driven by electricity or gas. This definition excludes the use of energy to drive fans, blowers, or evaporative cooling systems ("Swamp Coolers") that are not connected to a refrigeration unit. It does include the use of electricity to drive fans that are part of a central air-conditioning system. Zero end-use energy for air conditioning is assigned to households that have air-conditioning equipment, but reported that the equipment was not used during the summer preceding the interview. See **End-Use** and **Appendix B**, "End-Use Estimation Methodology."

**Air-Conditioning Equipment:** A central air-conditioning system with ducts, and/or window or wall air conditioners that cools the air in a housing unit by a refrigeration unit driven by electricity or natural gas. Excluded are fans, blowers, or evaporative cooling systems ("swamp coolers") that are not connected to a refrigeration unit. Air-conditioning units that were not in working condition or were not used, are still included in RECS if they are in place in the housing unit. See **Air Conditioning**, **Air-Conditioned Rooms**, and **Refrigeration Unit**.

**Air-Conditioning Intensity:** The ratio of air-conditioning consumption or expenditures to square footage of cooled floorspace and cooling degree-days (base 65 degrees F). This intensity provides a way of comparing different types of housing units and households by controlling for differences in housing unit size and weather conditions. The square footage of cooled floorspace is equal to the product of the total square footage times the ratio of the number of rooms that could be cooled to the total number of rooms. If the entire housing unit is cooled, the cooled floorspace is the same as the total floorspace. The ratio is calculated on a weighted, aggregate basis according to this formula:

$$\text{Air-Conditioning Intensity} = \frac{\text{Btu for Air Conditioning}}{(\text{Cooled Square Feet} * \text{Cooling Degree-Days})}$$

See **Air Conditioning**, **Air-Conditioned Rooms**, and **Cooling Degree-Days**.

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

**Appliances:** Appliance operation is one of four main end-use categories in this report. It is defined as the use of energy for all uses except those covered by space heating, water heating, and air conditioning. This includes energy used in refrigerators, freezers, lights, televisions, personal computers, washing machines, and most small appliances. Special energy uses that are included in appliance usage are energy used to heat food, heat water for cooking, heat water for hot drinks, heat air to dry clothes, heat water for a swimming pool, heat water in a water bed, operate fans for a central forced-air space-heating system, and operate fans, blowers, or an evaporative cooling system (swamp coolers) not associated with air-conditioning equipment. See **End-Use** and **Appendix B**, "End-Use Estimation Methodology."

**Appliances Used:** Appliances possessed and used by the household during the year. Appliances possessed by the household but not used are not counted. 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. The following list of appliances were asked specifically in the RECS: refrigerator, swimming pool, hot tub or jacuzzi heaters, stove top burners, ovens (excluding toaster ovens), microwave ovens, outdoor gas grills, clothes washers, dishwashers, clothes dryers, outdoor gas lights, dehumidifiers, humidifiers, evaporative coolers, fans, electric blankets, water-bed heaters, and television sets. Swimming pool, hot tub or jacuzzi heaters are included only if they are for the exclusive use of the housing unit; these heaters that are for the use of many resident households (such as those in apartment buildings, condominiums, or cooperatives) are excluded. The "range" (stove-top burners) and "oven" are considered two separate appliances, although they are often purchased as one appliance. See **Refrigerator** and **Evaporative Cooler**.

**Assistance for Heating in Winter:** Indicates the household answered "yes" to whether the household received assistance from the Low-Income Home Energy Assistance Program (LIHEAP) between October, 1986 and September, 1987. The purpose of LIHEAP was to provide assistance to low-income households to offset the rising costs of home energy that are excessive in relation to household income. The most recent report on the program is found in the U.S. Department of Health and Human Services', *Low-Income Home Energy Assistance Program: Report to Congress for Fiscal Year 1987*, July 21, 1988. Copies are available from: Office of Energy Assistance, Office of Community Services, 370 L'Enfant Promenade, S.W., Washington, D.C. 20447.

**Assistance for Weatherization of Residence:** The household received services free, or at a reduced cost, from the Federal, State, or local Government between October 1, 1986 and September 30, 1987. Any of the following services could have been received:

- a. Furnace tuneup and/or modifications,
- b. Insulation around the hot water heater,
- c. Insulation in the attic, outside wall, or basement/crawlspace below the floor of the house,
- d. Repair of broken furnace,
- e. Repair of broken windows or doors to keep out the cold or hot weather,
- f. Storm doors or windows added,
- g. Weather stripping or caulking around any windows or doors to the outside,
- h. Other home energy-saving devices.

**Authorization Form:** A form, to be signed by the respondent authorizing energy supplier companies that serve the respondent to release information on the amounts and costs of energy consumed in the housing unit during a specified period. See **Energy Supplier** and **Appendix A**, "How the Survey Was Conducted."

**Availability of Natural Gas in the Neighborhood:** Respondents who did not use natural gas were asked "Is gas from underground pipes available in this neighborhood?" Because respondents were not provided with a definition of "available" or "neighborhood," some variation is to be expected in what these concepts meant to each respondent. The intent of this question is to determine whether a residence could be hooked up to a gas line.

**Average Number:** See **Aggregate Ratio** and **Mean**.

**Billing Period:** The time between meter readings. It does not refer to the time when the bill was sent or when the payment was to have been received. In some cases, the billing period is the same as the billing cycle that corresponds closely (within several days) to meter-reading dates. For fuel oil and LPG, the billing period is the number of days between fuel deliveries.

**Block-Rate Structure:** An electric rate schedule with a provision for charging a different unit cost for various increasing blocks of demand for energy. A reduced rate is charged on succeeding blocks.

**Btu (British thermal unit):** The amount of energy required to raise the temperature of 1 pound of water by 1 degree Fahrenheit at or near 39.2 degrees Fahrenheit and 1 atmosphere of pressure. One Btu is about equal to the heat given off by a blue-tip match. See **Btu Conversion Factors**.

**Btu Conversion Factors:** For this report, Btu conversion factors for site energy were as follows:

|                      |            |                  |
|----------------------|------------|------------------|
| Electricity .....    | 3,412      | Btu/kilowatthour |
| Natural Gas .....    | 1,031      | Btu/cubic foot   |
| Fuel Oil No. 1 ..... | 135,000    | Btu/gallon       |
| Kerosene .....       | 135,000    | Btu/gallon       |
| Fuel Oil No. 2 ..... | 138,690    | Btu/gallon       |
| LPG (propane) .....  | 91,330     | Btu/gallon       |
| Wood .....           | 20 million | Btu/cord         |

Other conversion factors used in this report include:

1 therm = 100,000 Btu  
1 barrel = 42 gallons

Because almost all LPG reported by the fuel suppliers was propane, the LPG conversion factor is that for propane. See **Wood Conversion to Btu, Site Energy, and Conversion Factor**.

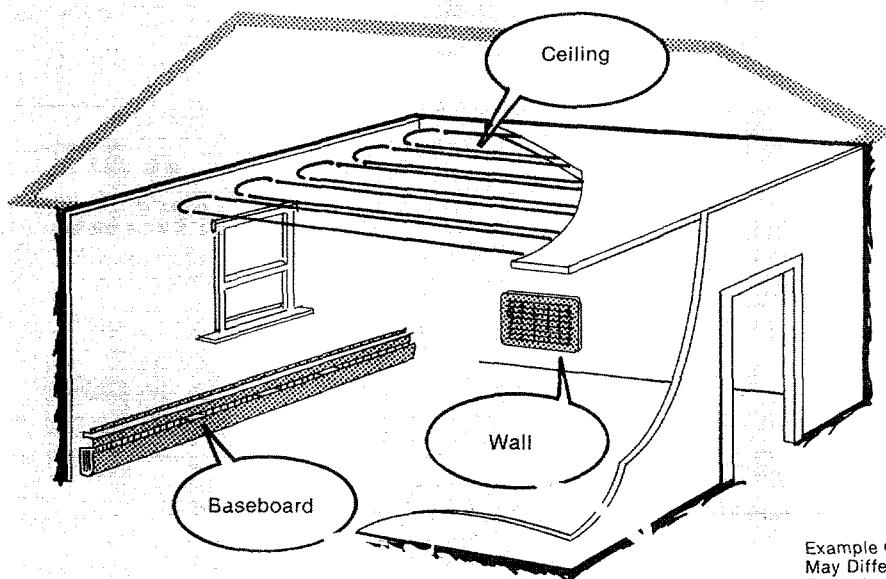
**Budget Plan:** An agreement between the household and the utility company or fuel supplier that allows the household to pay the same amount for fuel each month for a number of months.

**Building of 2-4 Units:** See **Housing Structure**.

**Building of 5 or More Units:** See **Housing Structure**.

**Built-in Electric Units:** An individual-resistance electric-heating unit that is permanently installed in the floors, walls, ceilings, or baseboards and is part of the electrical installation of the building. Electric-heating devices that are plugged into an electric socket or outlet are not considered built in. See **Space-Heating Equipment**.

## Built-in Electric Units



Example Only. Your Equipment  
May Differ in Minor Ways  
From the Example Shown.

**CDD:** See **Cooling Degree-Days**.

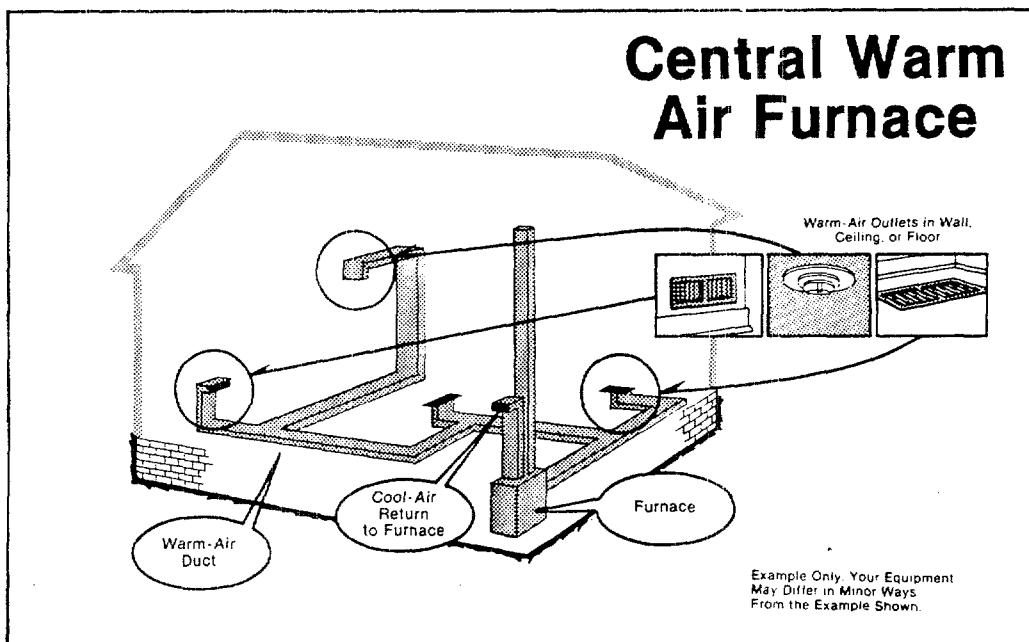
**Census Division:** A geographic area consisting of several States defined by the U.S. Department of Commerce, Bureau of the Census. See the map in Appendix F, "U.S. Census Regions and Divisions." The States are grouped into nine divisions and four regions:

| Region    | Division           | States  |
|-----------|--------------------|---|
| Northeast | New England        | Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont   |
|           | Middle Atlantic    | New Jersey, New York, and Pennsylvania  |
| Midwest   | East North Central | Illinois, Indiana, Michigan, Ohio, and Wisconsin  |
|           | West North Central | Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota   |
| South     | South Atlantic     | Delaware, the District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia |
|           | East South Central | Alabama, Kentucky, Mississippi, and Tennessee   |
|           | West South Central | Arkansas, Louisiana, Oklahoma, and Texas  |
| West      | Mountain           | Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming  |
|           | Pacific            | Alaska, California, Hawaii, Oregon, and Washington  |

**Census Region:** See **Census Division** and the map in Appendix F, "U.S. Census Regions and Divisions."

**Central City:** Usually one or more legally incorporated cities within the Metropolitan Statistical Area (MSA) that is significantly large by itself or large relative to the largest city in the MSA. Additional criteria for being classified central city include having at least 75 jobs for each 100 employed residents and having at least 40 percent of the resident workers employed within the city limits. Every MSA has at least one central city, which is usually the largest city. Central cities are commonly regarded as relatively large communities with a denser population and a higher concentration of economic activities than the outlying or suburban areas of the MSA. "Outside Central City" are those parts of the MSA that are not designated as central city. See **Metropolitan**.

**Central Warm-Air Furnace:** A central combustor or resistance unit--generally using gas, fuel oil, or electricity--that provides warm air through ducts leading to the various rooms in the housing unit. Heat pumps are not included in this category. A forced-air furnace is one in which a fan is used to force the air through the ducts. In a gravity furnace, air is circulated by gravity, relying on the natural flow of warm air up and cold air down. The warm air rises through ducts and the cold air falls through ducts that return it to the furnace to be reheated. This completes the circulation cycle.



**Climate Zone:** One of five climatically distinct areas, defined by long-term weather conditions affecting the heating and cooling loads in buildings. The zones were developed by the Energy End Use Division from seven distinct climate categories originally identified by the American Institute of Architects (AIA) for the U.S. Department of Energy and the U.S. Department of Housing and Urban Development. The zones were determined according to the 30-year average (1951-1980) of the annual heating and cooling degree-days (base 65 degrees F). The zones are defined as follows:

| AIA Group | EEUD Climate Zone | Average Annual Cooling Degree-Days | Average Annual Heating Degree-Days |
|-----------|-------------------|------------------------------------|------------------------------------|
| 1         | 1                 | Under 2,000                        | Over 7,000                         |
| 2         | 2                 | Under 2,000                        | 5,500 to 7,000                     |
| 3         | 3                 | Under 2,000                        | 4,000 to 5,499                     |
| 4         | 4                 | Under 2,000                        | 2,000 to 3,999                     |
| 5         | 4                 | Under 2,000                        | Under 2,000                        |
| 6         | 5                 | 2,000 or more                      | Under 2,000                        |
| 7         | 5                 | 2,000 or more                      | 2,000 to 3,999                     |

An individual household was assigned to a climate zone according to the 30-year average annual degree-days for an appropriate nearby weather station. See **Heating Degree-Days (HDD)**, **Cooling Degree-Days (CDD)**, and **NOAA Division**.

**Coal:** A combustible mineral substance (carbonized vegetable matter); in this report, the term includes its derivative (formed by destructive distillation or imperfect combustion) coke. This report contains statistics on the number of households using coal and their consumption of other fuels; however, no data were collected on the consumption of coal. See **Fuel**.

**Condominium:** A type of ownership that enables a person to own an apartment or house in a project of similar units. The owner has his/her own deed and, most likely, his/her own mortgage on the unit. The owner also holds a common or joint ownership in all common areas, such as hallways, entrances, and elevators. Ownership may cover one-family houses, row houses, and townhouses as well as apartments.

**Consumption:** The amount of electricity or natural gas used by, or delivered to, the household during a 365-day period. For fuel oil, kerosene, and LPG, the quantity represents fuel purchased, not fuel consumed. If the level of fuel in the tank was the same at the beginning and end of the annual period, then the quantity consumed would be the same as the quantity purchased. Measurements or reports of the level of fuel in the tank were not included in the data collection. The time period for the energy consumption in this report is January through December 1987.

**Control Total:** The number of elements in the population or a subset of the population. The sample weights for the observed elements in a survey are adjusted so that they add up to the control total. The value of a control total is not obtained from the survey, it is obtained from an outside source. For the RECS, the control totals are given by the number of households in one of the 12 cells by categorizing households by the four Census regions and by three categories of metropolitan status (Metropolitan Statistical Area--central city, Metropolitan Statistical Area--outside central city, and non-Metropolitan Statistical Area). The control totals were obtained from the Current Population Survey. See Table A9, in Appendix A, "How the Survey Was Conducted."

**Conversion Factor:** A number which translates units of one system into corresponding values of another system. Conversion factors are used to translate physical units of measures for various fuels into Btu equivalents. See **Btu Conversion Factors**.

**Cooking Stove:** A stove built for preparing food. In this survey it may be used as the main heating equipment. The range (stove-top burners) and oven are considered two separate appliances in this survey. See **Main Heating Equipment and Appliances Used**.

**Cooling Degree-Days (CDD):** A measure of how hot a location was over a period of time, relative to a base temperature. In this report, the base temperature is 65 degrees Fahrenheit, and the period of time is one year. The cooling degree-days for a single day is the difference between that day's average temperature and the base temperature, if the daily average is greater than the base; and zero, if the daily temperature is less than or equal to the base temper-

ature. The average daily temperature is the mean of the maximum and minimum temperatures for a 24-hour period. Cooling degree-days are determined by subtracting 65 from the average daily temperature. For example, a day with an average temperature of 85 degrees F has 20 cooling degree-days ( $85 - 65 = 20$ ), while a day with an average temperature of 65 degrees F or lower has zero. 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).

In 1987, for the first time in the RECS, cooling degree-days for households were taken from records of an appropriate nearby weather station. In previous surveys, weather data were assigned to households according to the NOAA division in which the household was located. See **NOAA Division and Climate Zone**.

**Elderly:** Households with a householder age 60 years or older. Nonelderly households have a householder age 59 years or younger.

**Electricity:** Metered electric power supplied by a central utility company to a residence via underground or above-ground power lines. It does not refer to electricity generated on site for the exclusive use of a residence. When a residence has its own generating capability, the fuel used for the generator will be specified. The Btu equivalent for electricity used in this report is the site energy or the energy value as received by the household. See **Btu Conversion Factors, Site Energy, and Adjusted Electricity**.

**Electricity Paid by Household:** The household paid the electric utility company directly for all household uses of electricity (such as water heating, space heating, air-conditioning, cooking, lighting, and operating appliances.) Bills paid by a third party are not counted as paid by the household. See **Electricity**.

**End Use:** A function for which energy sources or fuels are used in the household. In this report, four main end-use categories were estimated: space heating, air conditioning, water heating and appliance usage. The amount of energy used for these end uses is estimated by means of a nonlinear regression technique, rather than by using metered data. See **Space Heating, Air Conditioning, Water Heating, Appliances, Metered Data, and Appendix B, "End-Use Estimation Methodology."**

**Energy Supplier:** Fuel companies supplying electricity, natural gas, fuel oil, kerosene or LPG to the household. See **Authorization Form and Appendix A, "How the Survey Was Conducted."**

**Estimated Bill:** A set of charges for a fuel, calculated by the supplier when the meter is not read. The estimate may be based on one or more of the following factors: past usage, usage by similar households, and weather data.

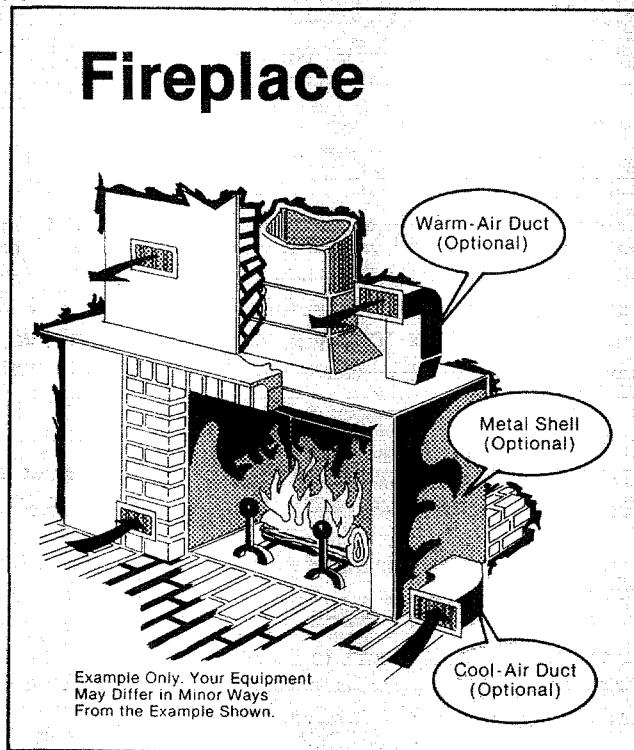
**Evaporative Cooler (Swamp Cooler):** A type of cooling equipment using evaporation of water to cool air. This type of equipment is commonly found in warm, dry climates. It does **not** cool air by use of a refrigeration unit, so it is not considered air-conditioning equipment in this report. See **Appliances Used**.

**Expenditures:** Funds spent for the energy consumed in, or delivered to, a housing unit during a given period of time. For this report, all expenditure statistics are presented on an annual basis, for calendar year 1987. The total dollar amount includes State and local taxes, but excludes merchandise repairs, or special service charges. For households on a budget plan, the expenditures are for the actual consumption. Electricity and natural gas expenditures are for the amount of those energy sources consumed. Fuel oil, kerosene, and LPG expenditures are for the amount of fuel purchased, which may differ from the amount of fuel consumed (See **Consumption**). For households that do not pay to their fuel supplier directly, the expenditures for fuels are estimated and included in the tables. In 1987, for 19 percent of the households, the cost of one or more fuels was included in a tenant's rent or paid by someone outside of the household.

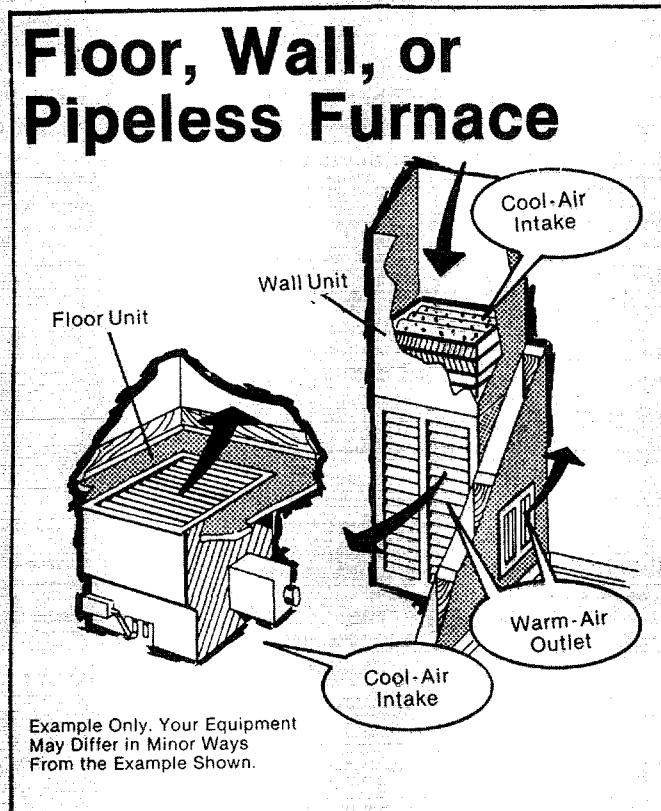
**Expenditures as a Percentage of Income:** The household energy expenditures divided by the family's income. The median percentage is the percentage of income spent on energy for the middle household, when the households are ranked by the percentage they spend on energy. That is, 50 percent of the weighted households in the cell spend a lower percentage on energy than the median value. See **Median**.

**Family Income:** The total combined income (before taxes and deductions) of all members of the family from all sources, for the 12 months before the interview. It includes wages, salaries, tips, commissions, and income from Social Security, pensions, interest, dividends, rent, public assistance, and unemployment insurance. This definition includes the total income of all family members who lived in the household during the 12 months before the interview, regardless of whether they were living there at the time of the interview. Income of nonfamily members of the household is not included. "Family" includes the following types of relationships: mother, father, sister, brother, son, daughter, father-in-law, uncle, aunt, niece, grandchild, foster child (and similar relationships).

**Fireplace:** Usually a masonry unit which burns wood, that is built into the wall of a house. Fireplaces in mobile homes are included. A fireplace must have a permanent chimney. Fireplaces may have glass doors or metal shields to cover the opening into the room. Accessories such as convective grates or radiant grates may be present to increase the efficiency of the fireplace. A free-standing fireplace that can be detached from its chimney is a heating stove. See Heating Stove.



**Floor, Wall, or Pipeless Furnace:** One of three types of space-heating equipment designed to warm the rooms of a housing unit. A floor furnace is located below the floor and delivers heated air to the room immediately above, or (if under a partition) to the room on each side. A wall furnace is installed in a partition or in an outside wall and delivers heated air to the rooms on one or both sides. A pipeless furnace is installed in a basement and delivers heated air through a large register in the floor of the room or hallway immediately above. See Main Heating Equipment.



**Fossil Fuels:** Sources of energy extracted from the earth. In this report, fossil fuels are natural gas, fuel oil, kerosene, and liquefied petroleum gas. See Natural Gas, Fuel Oil, Kerosene, and Liquefied Petroleum Gas.

**Fuel:** The primary fuel delivered to a residential site. It may be converted to some other form of energy at the site. In this report, electricity is included as a fuel. Other primary fuels are coal, fuel oil, kerosene, liquefied petroleum gas (LPG), natural gas, and solar collectors. Consumption and expenditure data were not collected for coal or solar applications.

**Fuel Oil:** A liquid petroleum product less volatile than gasoline, used as an energy source. In this report, fuel oil includes No. 1, No. 2, or No. 4 grade fuel oil or residual oil that is burned for space-heating or water-heating purposes. No. 1 distillate fuel oil is a form of heating oil used mostly as a blending stock to assure that heavier grades of fuel flow under severe cold weather conditions. No. 2 distillate collectively refers to No. 2 heating oil and No. 2 diesel fuel. Although these products are not precisely identical, they are essentially interchangeable in most applications. No. 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 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 are boiled off in refinery operations. See Fuel.

**Fuel Oil Paid by Household:** The household paid the supplier directly for all household uses of fuel oil or kerosene (such as space heating or water heating). Bills paid by a third party are not counted as paid by the household. See Fuel.

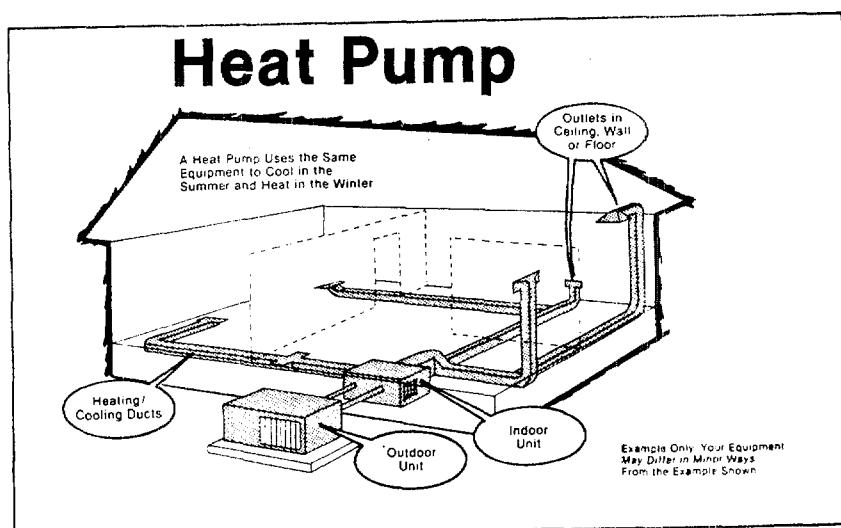
**Fuel Oil Suppier:** See Energy Supplier.

**Gas Paid by Household:** The household paid the utility company directly for all household uses of natural gas (such as water heating, space heating, air conditioning, cooking, and operating appliances including outdoor gas lights). Bills paid by a third party are not counted as paid by the householder. See Fuel.

**HDD:** See Heating Degree-Days.

**Heat Pump (Reverse Cycle System):** A year-round heating/air-conditioning system in which refrigeration equipment supplies both heating and cooling through ducts leading to individual rooms. A heat pump generally consists of a compressor, both indoor and outdoor coils, and a thermostat. In the RECS, all heat pumps are considered to be electrically powered.

The heat pump, when attached to a central furnace, is either the main or secondary heating equipment (depending on how often the heat pump operates). If it operates for a short time and then the furnace comes on, the heat pump is secondary (or additional) heating equipment. If the heat pump is sufficient to provide the desired warmth, the heat pump is cited as the main heating equipment.



**Heated Area of Residence:** This area is the portion of the measured square feet of a housing unit that is heated during most of the winter season. Rooms that are shut off during the heating season to save fuel are not counted as heated square footage. Attached garages that are unheated, and unheated areas in basements and attics, are not counted as heated square feet. See **Square Feet**.

**Heating Degree-Days (HDD):** A measure of how cold a location was over a period of time, relative to a base temperature. In this report, the base temperature used is 65 degrees Fahrenheit, and the period of time is one year. The heating degree-days for a single day is the difference between the base temperature and the day's average temperature, if the daily average is less than the base; and zero, if the daily average temperature is greater than or equal to the base temperature. The 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 F from the base 65. For example, a day with an average temperature of 50 degrees F has 15 heating degree-days ( $65 - 50 = 15$ ), while one with an average temperature of 65 degrees F or higher has zero.

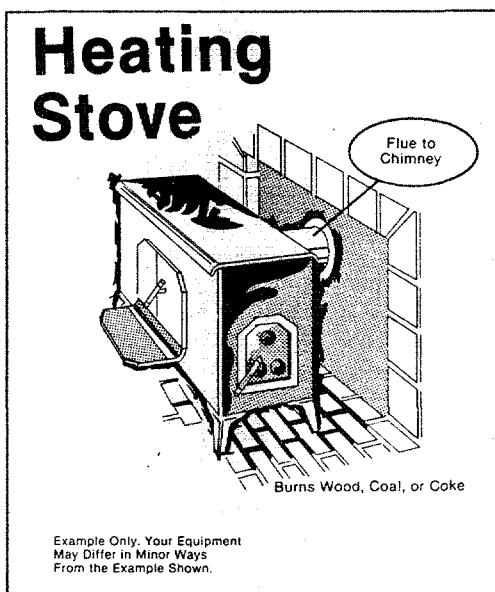
In 1987, for the first time in the RECS, heating degree-days for households were taken from records of an appropriate nearby weather station. In previous surveys, weather data were assigned to households according to the NOAA division in which the household was located. See **NOAA Division** and **Climate Zone**.

**Heating Intensity:** The ratio of space-heating consumption or expenditures to square footage of heated floorspace and heating degree-days (base 65 degrees F). This ratio provides a way of comparing different types of housing units and households by controlling for differences in housing unit size and weather conditions. The square footage of heated floorspace is based upon the measurements of the floorspace that is heated. The ratio is calculated on a weighted, aggregate basis according to the following formula:

$$\text{Heating Intensity} = \frac{\text{Btu for space heating}}{(\text{Heated Square Feet} * \text{Heating Degree-Days})}$$

See **Main Heating Equipment**, **Heated Area of Residence**, and **Heating Degree-Days**.

**Heating Stove Burning Wood, Coal, and Coke:** Any free-standing box or controlled-draft stove; or a stove installed in a fireplace opening, using the chimney of the fireplace. Stoves are made of cast iron, sheet metal, or plate steel. Free-standing fireplaces that can be detached from their chimneys are considered heating stoves. "Airtight" stoves allow the user to control the amount of air in the stove to regulate the rate of combustion. The doors fit tightly so that the air flow can be controlled. Many airtight stoves have a gasket around the door of the stove. "Nonairtight" stoves are those lacking gaskets around their door openings.



**Hispanic Descent:** This, as the question on race, was self-determined by the respondent. The respondent was asked, "Is the householder of Spanish or Hispanic descent?" The respondent's answer was recorded. See **Race**.

**Hot-Deck Imputation:** A statistical procedure for deriving a probable response to a questionnaire item concerning a household or vehicle, where no response was given during the survey. To perform this procedure, an analyst sorts the households or vehicles by variables related to the missing item. Thus, a series of sort categories are formed, which are internally homogeneous with respect to the sort variables. Within each category, households or vehicles for which the questionnaire item is not missing are randomly selected to serve as "donors" to supply values for the missing item of "recipient" households or vehicles. See **Imputation** and **Appendix A**, "How the Survey Was Conducted."

**Household:** A family, an individual, or a group of up to nine unrelated persons occupying the same housing unit. "Occupy" means the housing unit was the person's usual or permanent place of residence at the time of the first field contact. The household includes babies, lodgers, boarders, employed persons who live in the housing unit, and persons who usually live in the household but are away traveling or in a hospital. The household does not include persons (normally members of the household) who were away from home as college students or as members of the armed forces at the time of the contact. The household does not include the following: (1) persons temporarily visiting with the household if they have a place of residence elsewhere; (2) persons who take their meals with the household, but usually lodge or sleep elsewhere; (3) domestic employees or other persons employed by the household who do not sleep in the same housing unit; or (4) persons who are former members of the household, but have since become inmates of correctional or penal institutions, mental institutions, homes for the aged or needy, homes or hospitals for the chronically ill or handicapped, nursing homes, convents or monasteries, or other places in which residents may remain for long periods of time. By definition, the number of households is the same as the number of occupied housing units.

**Householder:** The person (or one of the people) in whose name the home is owned or rented. If there is no lease or similar agreement, or if the person who owns the home or pays the rent does not live in the housing unit, the householder is the person responsible for paying the household bills, or whoever is generally in charge.

**Housing Structure:** One of four structural types used to categorize the building in which the housing unit was located. The types of structure are as follows:

*Single-family housing unit*--a structure that provides living space for one household or family. The structure may be detached, attached on one side (semidetached), or attached on two sides. Attached houses are considered single-family houses as long as the house itself is not divided into more than one housing unit and has an independent outside entrance. A single-family house is contained within walls that go from the basement (or the ground floor, if there is no basement) to the roof. (A mobile home with one or more rooms added is classified as a single-family home.)

*House or building with two to four housing units*--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 these types of living quarters are separate apartments downstairs and upstairs, or one apartment on each of three or four floors.

*Building with five or more housing units*--a structure that contains living quarters for five or more households or families.

*Mobile home or trailer*--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 room or more. If rooms are added to the structure, it is considered a single-family housing unit.

**Housing Unit:** A structure or part of a structure where a household lives. It has direct access from the outside of the building either directly or through a common hall. Housing units do not include group quarters such as prisons or nursing homes where 10 or more unrelated persons live. Hotel and motel rooms are considered housing units if occupied as the usual or permanent place of residence.

**Imputation:** A statistical method used to fill in values for missing items, designed to minimize the bias of estimates based on the filled-in data set. See **Hot-Deck Imputation** and **Appendix A**, "How the Survey Was Conducted."

**Indicator Variable:** A variable that is equal to either zero or one. The variable equals one when a set of conditions is met and equals zero when the set of conditions is not met. In particular, the variable "indicates" that the conditions have been met when the variable equals one.

**Kerosene:** A distilled product of oil or coal with the generic name kerosene, having properties similar to those of No. 1 fuel oil. Kerosene is primarily used in cooking stoves, space heaters, water heaters, or for lighting equipment that uses wicks. It is sometimes sold under the names "range oil," "stove oil," or "coal oil." See **Fuel** and **Fuel Oil**.

**kWh (kilowatthour):** A measure of electricity defined as a unit of work or energy, measured as 1 kilowatt (1,000 watts) of power expended for 1 hour. One kWh is equivalent to 3,412 Btu. See **Btu** and **Btu Conversion Factors**.

**LIHEAP or Low-Income Home Energy Assistance Program:** See **Assistance for Heating in Winter**.

**Liquefied Petroleum Gas (LPG):** Any fuel gas supplied to a residence in liquid form, such as propane or butane. It may also be called "bottled gas". It is usually delivered by tank truck and stored near the residence in a tank or cylinder until used. Propane was the most common liquefied petroleum gas supplied to RECS households. Household use of LPG solely for outdoor gas grills or in recreational vehicles is not considered sufficient use to mark the household as a user of LPG. See **Fuel**.

**LPG:** See **Liquefied Petroleum Gas**.

**LPG Paid by Household:** The household paid the fuel supplier directly for all household uses of LPG such as water heating, space heating, air conditioning, cooking, (other than cooking on an outdoor grill, which is excluded) and operating appliances. Bills paid by a third party are not counted as paid by the household. See **Fuel**.

**Main Heating Equipment:** The equipment primarily used for heating ambient air in the housing unit. The main heating equipment is reported as such even if it is temporarily out of order. If two types of heating equipment are used, the main heating equipment is the one that is used more. If both are used equally, the main heating equipment is the one that appears first on the list in the question. A "cooking stove" may be used as the main heating equipment even though it was built for preparing food. See also description of specific types of heating equipment, such as **Central Warm-Air Furnace, Heat Pump, Built-In Electric Units, Steam or Hot-Water System, Floor, Wall or Pipeless Furnace, Heating Stove, Room Heater, and Secondary Heating Equipment**

**Main Heating Fuel:** The fuel named by the respondent in response to the question "What is the main fuel used for heating your home?" If two or more heating fuels are used, the main heating fuel is the one that provides most of the heat for the home. See **Secondary Heating Fuel**.

**Master-Metering:** Measurement of electricity or natural gas consumption of several tenants or housing units using a single meter. That is, one meter measures the energy usage for several households collectively.

**Mean:** The simple arithmetic average for a population; that is, the sum of all the values in a population divided by the size of the population. For this report, population means are estimated by computing the weighted sum of the sample values, then dividing by the sum of the sample weights. Thus, the mean is an aggregate ratio with the total number of households the denominator. See **Aggregate Ratio** and **Weight**.

**Median:** A measure of central tendency, intended to express a "typical" value for an attribute. The median is different from the arithmetic average (mean) in that its value is not influenced much by extremes. For example, the mean number of cords of wood consumed per household would be affected by the inclusion of a few heavy users of wood, and would not express wood consumption for a "typical" wood-using household. However, the median number of cords of wood consumed per household would not be so affected. Medians are computed by listing all values in ascending order. The value that divides the list in half is the median.

**Metered Data:** End-use data obtained through the direct measurement of the total energy consumed for specific uses within the individual household. Individual appliances can be submetered by connecting the recording meters directly to individual appliances. See **End Use** and **Submetered Data**.

**Metropolitan:** A group of households located within Metropolitan Statistical Areas (MSA's) as defined by the U.S. Office of Management and Budget. Except in New England, an MSA is (1) a county or group of contiguous counties that contain at least one city of 50,000 inhabitants or more, or (2) an urbanized area of at least 50,000 inhabitants and a total MSA population of at least 100,000 (75,000 in New England). The contiguous counties are included in an MSA if, according to certain criteria, they are essentially metropolitan in character and are socially and economically integrated with the central city. In New England, MSA's consist of towns and cities, rather than counties. See **Nonmetropolitan** and **Central City**.

**Metropolitan Status:** Refers to geographic location of the households in relationship to Metropolitan Statistical Areas (MSA's). See **Metropolitan**, **Nonmetropolitan**, and **Central City**.

**Mobile Home:** See **Housing Structure**.

**MSA:** See **Metropolitan**.

**Multistage Area Probability Sample:** A sample design executed in stages with geographic "clusters" of sampling units selected at each stage. This procedure reduces survey expense while maintaining national coverage. See **Appendix A**, "How the Survey Was Conducted."

**Natural Gas:** Hydrocarbon gas (mostly methane) supplied as an energy source to individual housing units by underground pipelines from a central utility company. It does not refer to privately-owned gas wells operated by the household, nor to liquefied petroleum gas. See **Fuel**.

**NOAA Division:** One of the 345 weather divisions designated by the National Oceanic and Atmospheric Administration (NOAA) encompassing the 48 contiguous States. These divisions usually follow county borders to encompass counties with similar weather conditions. The NOAA division does not follow county borders when weather conditions vary considerably within a county such as is likely to happen when the county borders the ocean or contains high mountains. A State contains an average of seven NOAA divisions; a NOAA division contains an average of nine counties.

**Nonelderly:** See **Elderly**.

**Nonmetropolitan:** Households not located within Metropolitan Statistical Areas as defined by the U.S. Office of Management and Budget. See **Metropolitan**.

**Number of Rooms:** Subdivisions of a housing unit. Rooms such as living rooms, dining rooms, bedrooms, kitchens, lodgers' rooms, finished basements or attic rooms, recreation rooms, and permanently enclosed sun porches that are used year-round are undivided. Rooms used for offices by a person living in the unit are also included in this survey. "Finished" means that the ceiling and walls are covered with finishing materials.

In the RECS, bathrooms, halls, foyers, or vestibules, balconies, closets, alcoves, pantries, strip or pullman kitchens, laundry or furnace rooms, unfinished attics or basements, open porches, and unfinished space used for storage are not considered rooms.

A partially divided room, such as a dinette next to a kitchen or a living room, is considered a separate room only if there is a partition from floor to ceiling--but not if the partition consists solely of shelves or cabinets. If a room is used by occupants of more than one unit, the room is included with the unit from which it is most easily reached.

**Occupied Housing Unit:** A unit someone was living in as his or her usual or permanent place of residence when the first field contact was made. The definition "Occupied Housing Units" is the same as that used by the U.S. Bureau of Census. See **Housing Unit**.

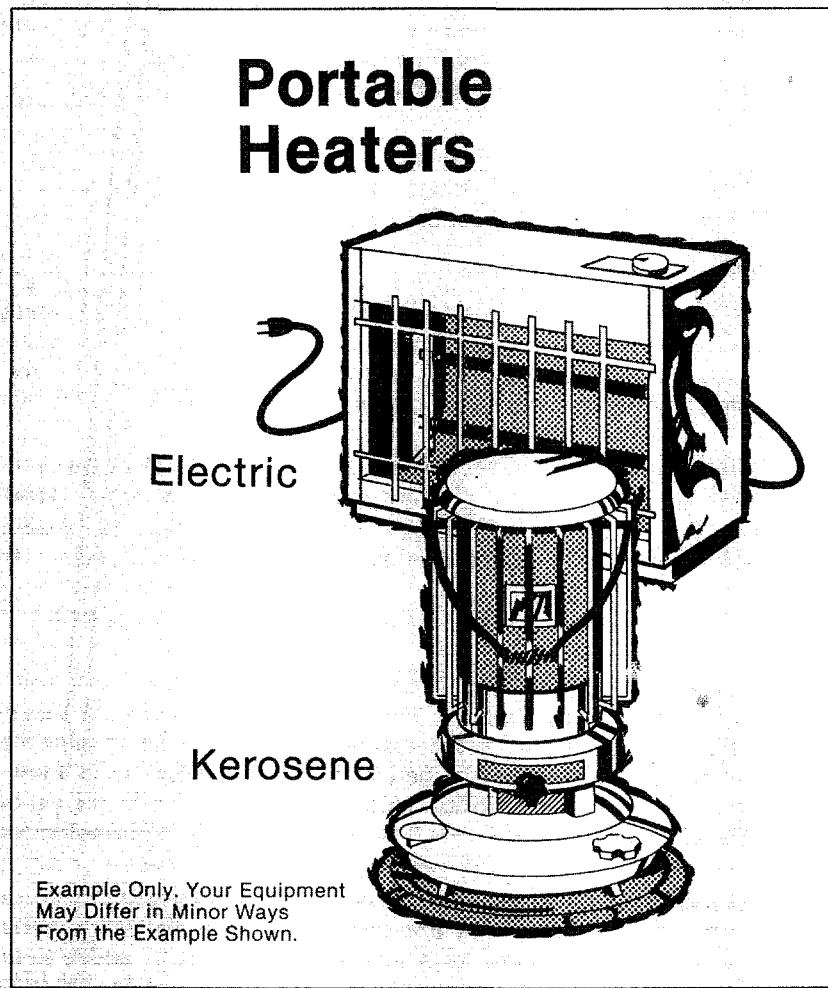
**Outside Central City:** See **Central City**.

**Oven:** An appliance that is an enclosed compartment supplied with heat and used for cooking food. Toaster ovens are not considered ovens for this survey. The range (stove-top burners) and oven are considered two separate appliances for the RECS, although they are often purchased as one appliance. See **Appliances Used**.

**Owned/Rented:** The relationship of the occupants of a structure to the structure itself, not to the land on which the structure is located. "Owned" means the owner or co-owner is a member of the household. The housing unit is considered owned if it is mortgaged and not fully paid for. A household is classified "rented" even if the rent is paid by someone not living in the unit. "Rent free" means the unit is not owned or being bought and no money is paid or contracted for rent. Such units are usually provided in exchange for services rendered or as an allowance or favor from a relative or friend not living in the unit. Unless shown separately, rent-free households are grouped with rented households.

**Payment Method for Utilities:** The method by which fuel suppliers or utility companies were paid for all electricity, natural gas, fuel oil, kerosene, or liquefied petroleum gas used by a household. Households that paid the utility company directly were classified in this survey as "all paid by household." Households that paid directly for at least one but not all of their fuels used and that has at least one fuel charge included in the rent were classified as "some paid, some included in rent." Households for which all fuels used were included in rent were classified as "all included in rent." If the household did not fall into one of these categories, it was classified as "other." Examples of households falling into the "other" category are: (1) households for which fuel bills were paid by a social service agency or a relative, and (2) households that paid for some of their fuels used but paid for other fuels through another arrangement.

**Portable Electric Heater:** A heater that uses electricity and that can be picked up and moved.



**Portable Kerosene Heater:** A heater that uses kerosene and that can be picked up and moved.

**Poverty:** Low-income classifications to which certain households are assigned using U.S. Bureau of the Census definitions. These definitions based on the number of family members in the household and the income of the entire family. "Below 100 percent of poverty line" encompasses a group of households with incomes below the poverty level as defined by the U.S. Bureau of the Census. "Below 125 percent of poverty line" includes a group of households with incomes below 125 percent of the poverty level. These groups of the poor and near-poor represent alternative levels for defining poverty. See Table C3 for the size and income criteria.

**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. See **Metropolitan** and **Appendix A**, "How the Survey Was Conducted."

**Propane:** See **Liquefied Petroleum Gas or LPG.**

**PSU:** See **Primary Sampling Unit.**

**Public Housing:** Housing units owned by a local housing authority or other local public agency such as a housing and redevelopment authority or a housing development agency. These organizations receive subsidies from the Federal or State government, but the local agency owns the property. To live in such a project, one must apply to the local housing authority.

**Quadrillion:** The quantity 1,000,000,000,000,000 ( $10^{15}$ ).

**Race:** The primary ethnic background of the person considered to be the householder as determined by the respondent. Each respondent was asked, "Which of the groups on this exhibit best describes the householder?" The groups included: white, black or Negro, American Indian, Alaskan native, Asian, and Pacific Islander. The word "race" was not used in either the questionnaire or the instructions. A separate question was asked Hispanic Descent. See **Hispanic Descent**.

**Range:** The stove-top burners used for cooking food. The range and oven are considered two separate appliances in RECS, although they are often purchased as one appliance. See **Appliances Used.**

**Refrigeration Unit:** A unit that lowers the temperature through a mechanical process. In a typical refrigeration unit, electricity powers a motor that runs a pump to compress the refrigerant into a liquid. (A "refrigerant" is a substance that changes between liquid and gaseous states under desirable temperature and pressure conditions.) Heat from the compressed liquid is removed and discharged from the unit and the refrigerant then evaporates when pressure is reduced. The refrigerant picks up heat as it evaporates and it returns to the compressor to repeat the cycle.

A few refrigeration units use gas (either natural gas or LPG) in an absorption process than does not use a compressor. The gas is burned to heat a chemical solution in which the refrigerant has been absorbed. Heating drives off the refrigerant which is later condensed. The condensed refrigerant evaporates by a release of pressure, and it picks up heat as it evaporates. The evaporated refrigerant is then absorbed back into the chemical solution, the heat is removed from the solution and discharged as waste heat, and the process repeats itself. By definition, refrigerators, freezers, and air-conditioning equipment all contain refrigeration units. See **Air-Conditioning Equipment**.

**Refrigerator:** A cabinet or box for keeping food cool, usually powered by electricity. Those few refrigerators with no freezer sections are included in the nonfrost-free category. "Frost-free" means that frost does not build up on the insides of the freezer section or the ice-cube section. All home refrigerators are assumed to have electric refrigeration units. Gas refrigeration units are not being manufactured in the United States for use in the home. Gas refrigerators (using LPG) are being manufactured for use in recreational vehicles, but LPG used in recreational vehicles is not included in the RECS. See **Appendix C, "Quality of the Data," Refrigeration Unit, and Appliances Used.**

**Regression Imputation:** A statistical technique for predicting the value of a numerical variable that is missing. The technique involves developing a regression equation that predicts the value of the missing variable based upon variables that are not missing or have already been imputed. A random error is usually added to the predicted value. The sum of the predicted value and the random error is used as the imputed value for the missing variable. See **Imputation.**

**Relative Standard Error:** See **RSE or Relative Standard Error.**

**Rent:** See **Owned/Rented.**

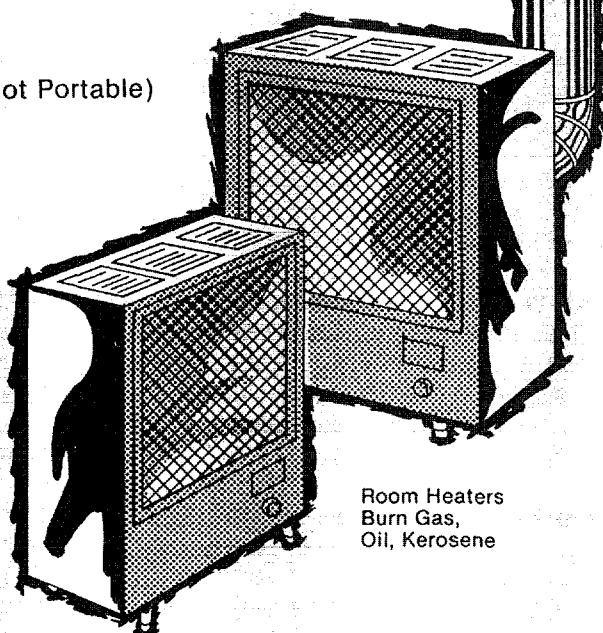
**Rent Subsidy:** Housing units that have a reduced rent because the Federal, State, or local Government is paying part of the cost of construction, building mortgage, or operating expenses.

**Residential:** Occupied housing units, including mobile homes, single-family housing units (attached and detached), and apartments. Residential does not include vacant housing units or second homes. See **Occupied Housing Units, Household, and Housing Unit.**

**Room Heater Burning Gas, Oil, Kerosene:** Any of the following equipment: circulating heaters, convectors, radiant gas heater, space heaters, or other nonportable room heaters that may or may not be connected to a flue, vent, or chimney. See **Main Heating Equipment.**

# Room Heaters

(Not Portable)



Example Only. Your Equipment  
May Differ in Minor Ways  
From the Example Shown.

## **Rooms: See Number of Rooms.**

**RSE or Relative Standard Error:** A measure of the reliability or precision of a survey statistic. 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 C, "Quality of the Data," for a discussion of sampling errors.

**RSE Column Factor:** An adjustment factor that appears above each column of the tables and is used to compute RSE's. For a survey estimate in a particular row and column of a table (that is, a particular "cell"), the approximate RSE is obtained by multiplying the RSE row factor by the RSE column factor for that cell. See **RSE**, **RSE Row Factor**, and **Appendix C**, "Quality of the Data."

**RSE Row Factor:** A factor that appears to the right of each row of the tables, and is 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. The row factor is equal to the geometric mean of the RSE's in a particular row of the tables. See **RSE**, **RSE Column Factor**, and **Appendix C**, "Quality of the Data."

**Sampling:** The procedure used to select housing units for interview from the population of residential housing units in the United States. See **Multistage Area Probability Sample** and **Appendix A**, "How the Survey Was Conducted."

**Secondary Heating Equipment:** Equipment used less often than the main heating equipment. See **Main Heating Equipment**.

**Secondary Heating Fuel:** Fuels used in secondary heating equipment. When no secondary heating equipment is used, a secondary heating fuel that is used in the main heating equipment is not included in the tabulations. This occurs when, for example, wood and coal are both used in a furnace but wood is named the main heating fuel. Coal, in this case, is not tabulated. See **Main Heating Fuel**.

**Single-Family:** See **Housing Structure**.

**Site Energy:** The Btu value of energy at the point it enters the home, sometimes referred to as "delivered" energy. In this report, the site value of energy is used for all fuels, including electricity. See **Adjusted Electricity** and **Btu Conversion Factors**.

**Solar Collector:** Equipment that actively concentrates thermal energy from the sun. The energy is usually used for space heating, for water heating, or for heating swimming pools. Either air or liquid is the working medium. Data was not collected on passive solar. See **Fuel** and **Active Solar**.

**Space Heating:** Space heating is one of four main end-use categories in this report. It is defined as the use of energy to generate heat for warmth in housing units using space-heating equipment. The equipment could be the main space-heating equipment or secondary space-heating equipment. It does not include the use of energy to operate appliances (such as lights, televisions, and refrigerators) that give off heat as a byproduct. In addition, the use of electricity to operate fans in central forced-air heating equipment is not included in space heating--this use is included in the appliance end-use category. See **End Use** and **Appendix B**, "End-Use Estimation Methodology."

**Space-Heating Equipment:** See **Main Heating Equipment**.

**Square Feet:** 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. Crawlspaces 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.

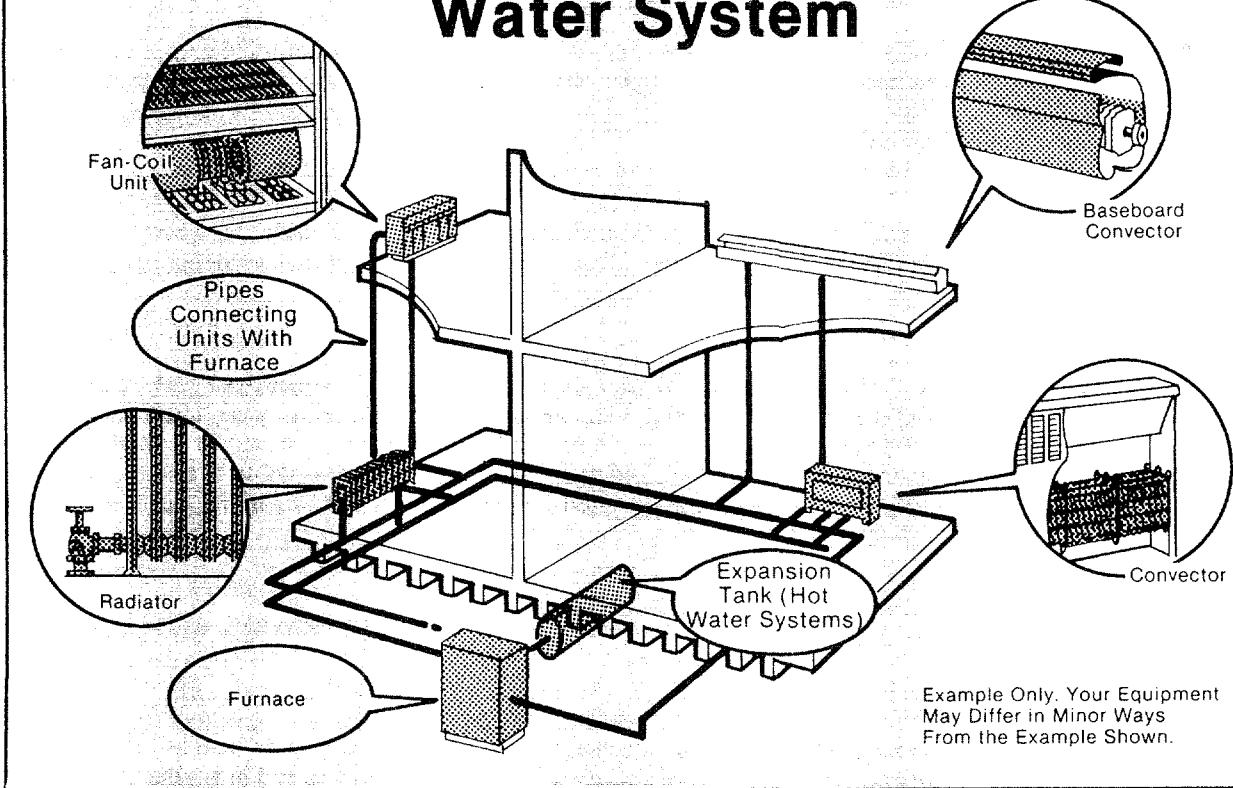
"Measured Square Feet" means that the measurement of the dimensions of the home did not rely on the respondent's reports but was an actual measurement made by the interviewer using a metallic, retractable, 50-foot tape measure. For details on how the measurement was made and how the data were treated, see **Appendix A**, "Estimates of Housing Unit Size."

**Standard Price:** The average residential rate for one kilowatthour (kWh). The local electric rate was computed from: *Typical Electric Bills January 1, 1987* DOE/EIA-0040(87); the U.S. Department of Agriculture typical bill data; billing data rates; and telephone calls to local utilities when no other data were available. The standard price is independent of the household's level of electricity consumption. See **Appendix A**, "How the Survey Was Conducted."

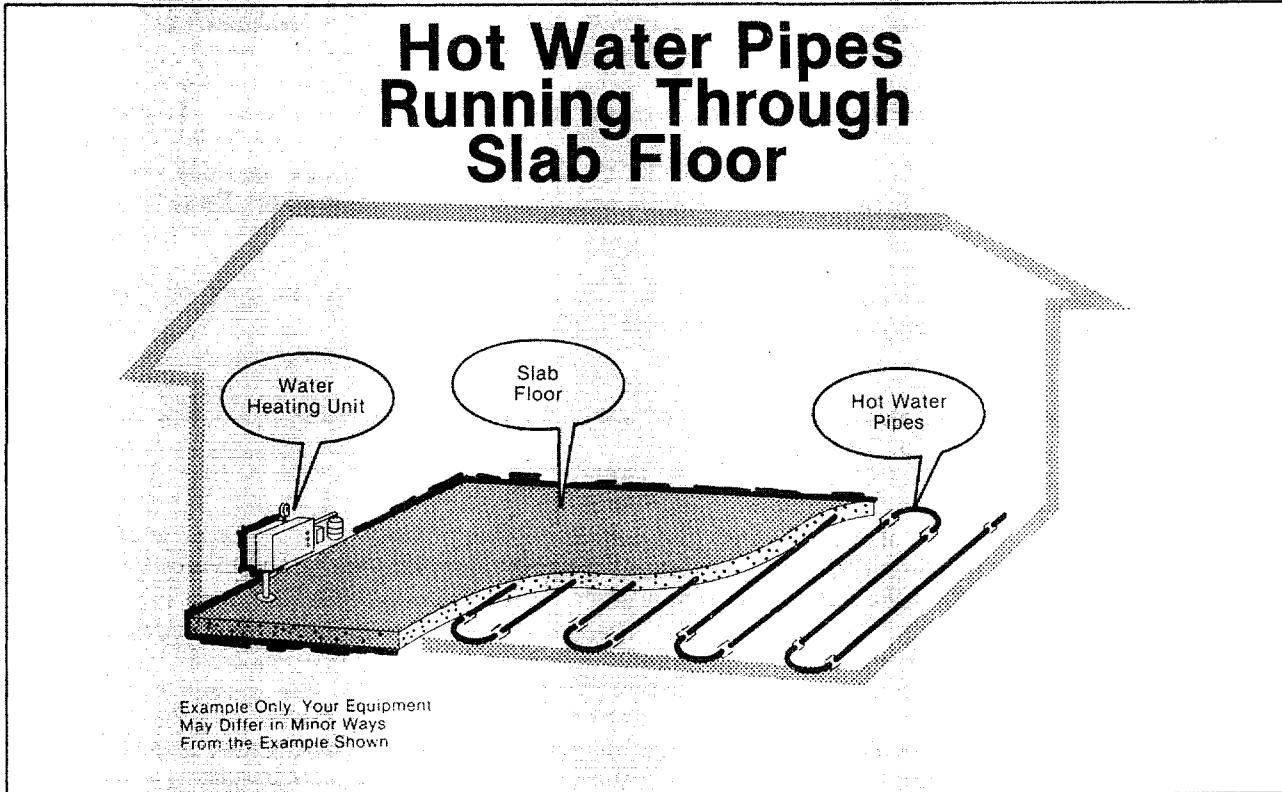
**Status of Unit:** See **Owned/Rented**.

**Steam or Hot-Water System:** Either of two types of central heating system that supplies steam or hot water to radiators, convectors, or pipes. The more common type supplies either steam or hot water to conventional radiators, baseboard radiators, convectors, heating pipes embedded in the walls or ceilings, or heating coils or equipment that are part of a combined heating/ventilating or heating/air-conditioning system. The other type supplies radiant heat through pipes that carry hot water and are inlaid in a concrete slab floor. See **Main Heating Equipment**.

## Steam or Hot Water System



## Hot Water Pipes Running Through Slab Floor



**Stove:** See **Heating Stove** and **Cooking Stove**.

**Submetered Data:** End-use consumption data obtained for individual appliances when a recording device has been attached to the appliance to measure the amount of energy consumed by the appliance. See **Metered Data**.

**Total Square Footage:** Square footage of floorspace summed or aggregated over all households in a category (such as all households in the United States). In this survey, aggregate square footage was estimated by multiplying each household's square footage by its weight, then summing over all sample households in a category to represent nationwide totals. See **Square Feet** and **Weight**.

**Vacant Housing Unit:** A housing unit not occupied when the first field contact was made. An occupied seasonal or migratory housing unit is classified as vacant at the time of the first contact if all of its occupants had a usual place of residence elsewhere.

**Vehicles:** Motorized vehicles used by U.S. households for personal transportation. Excluded are: motorcycles, mopeds, large trucks, and buses. Included are: automobiles, station wagons, passenger vans, utility vans, motor homes, pickup trucks, and jeeps or other 4-wheel drive vehicles. In order to be included, vehicles must be: (1) owned by members of the household; (2) company cars not owned by household members but regularly available to household members, for their personal use and ordinarily kept at home; or (3) rented or leased for 1 month or more. See **Vehicle Used on the Job**.

**Vehicle Used on the Job:** A vehicle used by anyone in the household for job-related activities, excluding commuting to and from work. See **Vehicles**.

**Water Heating:** Water heating is one of four main end-use categories in this report. It is defined as the use of energy to heat water for hot running water, as well as the use of energy to heat water on stoves and in auxiliary water-heating equipment for bathing, cleaning and other noncooking applications of hot water. The use of energy to heat water for cooking and hot drinks is not considered to be water heating--this use is included in the appliance end-use category. In addition, the use of energy to heat water for a swimming pool is not water heating--it also included in the appliance end-use category. See **End Use** and **Appendix B**, "End-Use Estimation Methodology."

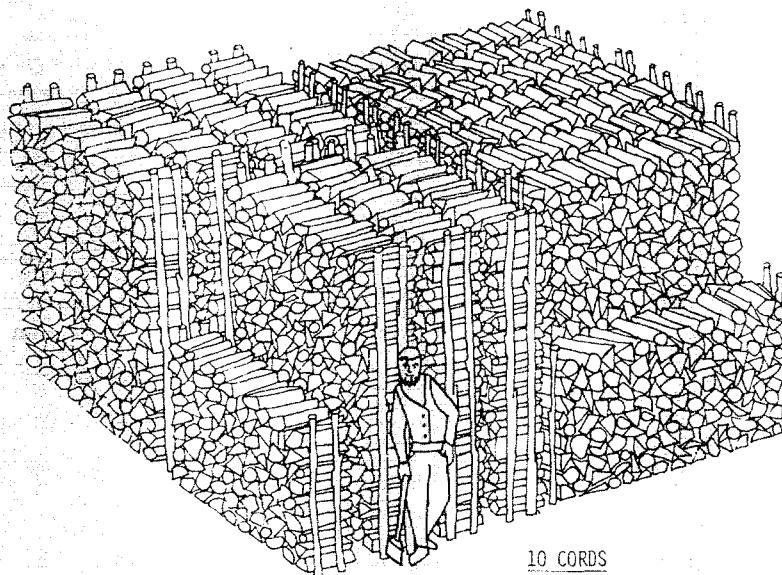
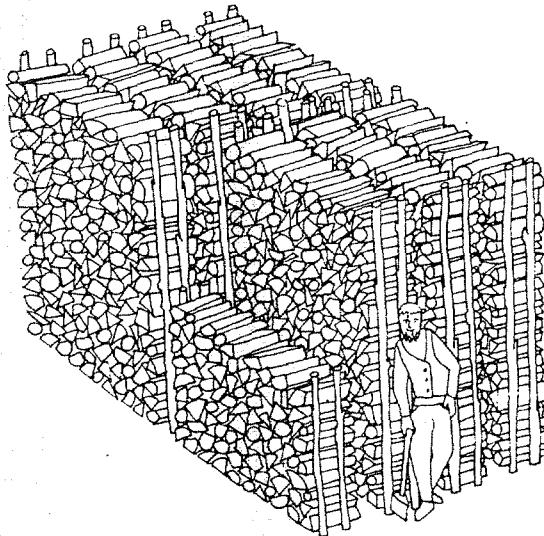
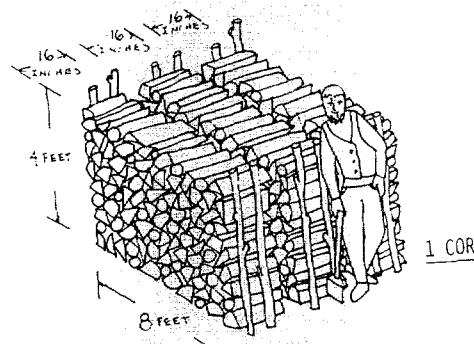
**Weight:** The number of households in the United States that a particular sample unit represents. To estimate the total value of an attribute (such as square footage) in the U.S. residential population as a whole, each sample household's value is multiplied by the household's weight. Summing the weighted sample values provides an estimate of the nationwide total. See **Multistage Area Probability Sample**, and **Appendix C**, "Quality of the Data."

**Whole-House Cooling Fan:** A large fan located in the attic or entrance to the attic and cools the whole house by drawing air through lower level windows. See **Appliances Used**.

**Window or Ceiling Fan:** Fans located in the window or installed on the ceiling. Portable or floor fans that are not used in a window are not counted. See **Appliances Used**.

**Wood Consumption:** The amount of wood burned in a fireplace, stove, or furnace, in the home at any time during the preceding 12 months as reported by the respondent at the time of the interview. The figures for wood burned cover the major part of the 1986-1987 heating season.

A cord of wood measures 4 feet by 4 feet by 8 feet and is approximately 128 cubic feet. A third of a cord measures 16 inches by 4 feet by 8 feet. In order to enable respondents to be more accurate in reporting the amount of wood they burned, especially those households that used more than 5 cords of wood, respondents were shown drawings which included a person holding an ax as a point of reference, and showed wood piles containing 5 and 10 cords. A smaller scale copy of the drawing shown to respondents for 1, 5, and 10 cords is reproduced below.



5 CORDS

10 CORDS

**Wood Conversion to Btu:** Converting cords of wood into a Btu equivalent is an imprecise procedure. The number of cords each household reports having burned is inexact, even with the more precise drawings provided, because the estimate requires the respondent to add up the use of wood over a 12-month period during which wood may have been added to the supply as well as removed. Besides errors of memory inherent in this task, the estimates are subject to problems in definition and perception of what a cord is. The nominal cord as delivered to a suburban residential buyer may differ from the dimensions of the standard cord. This difference is possible because wood is most often cut in lengths that are longer than what makes a third of a cord (16 inches) and shorter than what makes a half cord (24 inches).

In other cases, wood is bought or cut in unusual units (for example, pickup truck-load or trunk load). Finally, volume estimates are difficult to make when the wood is left in a pile instead of being stacked. Other factors that make it difficult to estimate the Btu value of the wood burned is that the amount of empty space between the stacked logs may vary from 12 to 40 percent of the volume. Moisture content may vary from 20 percent in dried wood to 50 percent in green wood. (Moisture reduces the useful Btu output because energy is used in driving off the moisture.) Finally, some tree species contain twice the Btu content of species with the lowest Btu value. Generally, hard woods

have greater Btu value than soft woods. Wood was converted to Btu at the rate of 20 million Btu per cord, which is a rough average that takes all these factors into account. See **Btu Conversion Factors**.

**Year of Construction:** The year the structure was originally completed or the year any part of the structure was first occupied. For mobile homes, year of construction is the model year.

