Nonresidential Buildings Energy Consumption Survey:

1979 Consumption and Expenditures

Energy Information Administration
Washington, D.C.

December 1983

Part 2:
Steam, Fuel Oil, LPG, and All Fuels
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This is the fourth in a series of reports from the Office of Energy Markets and End Use (EMEU) presenting data from the Nonresidential Buildings Energy Consumption Survey (NBECS). The other reports in the NBECS series include Building Characteristics, Fuel Characteristics and Conservation Practices, and Consumption and Expenditures, Part 1, Natural Gas and Electricity (see inside back cover for complete citation). The NBECS was designed, developed, and analyzed by the Energy Information Administration (EIA). This is the first time that either the public or the private sector has developed a method of collecting data on a statistical sample of nonresidential buildings across the country.

This report presents data on square footage and on total energy consumption and expenditures for commercial buildings in the contiguous United States.1 Also included are detailed consumption and expenditures tables for fuel oil or kerosene, liquid petroleum gas (LPG), and purchased steam.2 Commercial buildings include all nonresidential buildings with the exception of those where industrial activities occupy more of the total square footage than any other type of activity.3 Nonresidential buildings have been defined as roofed and walled structures that house some kind of commercial or industrial activity (see Glossary). Buildings that were primarily residential but showed evidence of commercial or industrial activities were also within the scope of the survey.

Table 1 displays average, median, and total square footage by selected building characteristics. These building characteristics include end use, location, structural features, use and occupancy characteristics, type of heating and cooling systems, and conservation practices.4 Tables 2 through 5 present total and average consumption and expenditures data (combined and disaggregated) by the same building characteristics.

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1 Estimates of the number of buildings and square footage cover the commercial building population as of January 1, 1980. Energy consumption and expenditures data are estimated for calendar year 1979. The tables present data from the final building characteristics and consumption files, both of which contain imputations for missing data (see Appendix B, "Limitations of the Data," for a description of the imputation procedures utilized).

2 Detailed tables for electricity and natural gas may be found in the Nonresidential Buildings Energy Consumption Survey: Consumption and Expenditures, Part 1, Natural Gas and Electricity. DOE/EIA-0318/1.

3 Buildings that were totally or primarily industrial, while eligible for inclusion in the survey, were not included in this report. These buildings were excluded due to poor sample coverage of the industrial buildings sector and extreme variability in their consumption estimates.

4 A detailed discussion of this table may be found in Consumption and Expenditures, Part 1.
Consumption and expenditures information is presented separately for fuel oil or kerosene, LPG, and steam buildings in Tables 6 through 9. In Tables 9 and 10, data are given on the number and capacity of tanks and inventory of fuel for buildings using fuel oil. Also included in this report are a summary of findings, a description of how the survey was conducted, a section on data limitations, relative standard error tables, copies of the questionnaire and utility forms, and a glossary.

Caution should be exercised when comparing the NBECS consumption data for buildings with consumption estimates for the commercial sector (see Appendix B, "Limitations of the Data," for comparisons with other data sources). The population of commercial buildings is not equivalent to the commercial sector. The commercial sector includes a sizable population of nonbuildings that are consumers of energy. Some examples include streetlights, pumps, bridges, swimming pools, construction sites, etc. The NBECS, which sampled buildings, cannot estimate the total consumption of the commercial sector, as it does not measure the consumption of nonbuildings.

The Energy Information Administration is currently conducting a 1983 Nonresidential Buildings Survey (NBECS II). Buildings that were surveyed in the original NBECS are being revisited to determine what changes have occurred in the buildings' structural and operational characteristics since January 1980. The original building sample has been updated with a sample of buildings constructed since January 1, 1980. Basic building and operating characteristics are being collected from representatives of the buildings new to the survey. Energy consumption and expenditure data for 1983 will be collected from the buildings' energy suppliers for both of the building samples.

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Because the data came from a sample of commercial buildings rather than the entire population, the estimates in this report are subject to sampling as well as nonsampling errors and biases. These issues are discussed in Appendix B, "Limitations of the Data." Estimates of the sampling error component have been produced for statistics in this report. They are given in Appendix C for the detailed tables and in parentheses after specific estimates quoted in the text. Sampling errors can be used to test statistical inferences made in the text. Testing procedures are also discussed in Appendix B.
Summary of Findings

In the nearly 4 million commercial buildings in the unincorporated Federal District, 97 percent of the total energy use was in these buildings. The following discussion will be based on the population of energy-consuming commercial buildings, which consisted of 2,976,200 (2.5% of all commercial buildings) as of January 1, 1988.

Total commercial consumption in 1987 for the five energy end-uses approximately 6.9 quads. 1 The average commercial building contained 1,417 square feet of floor space (1.60 b). Average consumption was 1,323 kWh per square foot at $38,950.00 and 89 cents per square foot. The total consumption for the entire District was $9,421,200 (4.6%) on average at $38,950.00 per building. 2

Figure 1 shows the percentage of buildings supplied by each of the major fuel types and the percentage of total consumption attributed to each fuel. Despite the increase in energy costs, the buildings have increased from 69 percent (60%) of the total consumption. However, as the figures indicate, the supply of 29 percent (25%) of the buildings is important for the analysis of the total consumption and all buildings.

Total buildings consumed 97 percent (94%) of all buildings by energy-consuming buildings and the 93 percent (90%) of the consumption for the sector. The average sized building contained 1,258 square feet of floor space ($38,750.00) on 1,303 kWh per square foot ($42,300.00). Buildings that contained 2,400 square feet of floor space had 1,377 square feet of floor space, and 97 percent of the total buildings contained 1,377 square feet of floor space. Buildings that contained 5,000 square feet of floor space had 1,377 square feet of floor space, and 97 percent of the total buildings contained 1,377 square feet of floor space. Buildings that contained 10,000 square feet of floor space had 1,377 square feet of floor space, and 97 percent of the total buildings contained 1,377 square feet of floor space. Buildings that contained 15,000 square feet of floor space had 1,377 square feet of floor space, and 97 percent of the total buildings contained 1,377 square feet of floor space.

Also, note that these estimates given in the above represent the smallest amount of energy consumed by the phase of analysis. However, the results of these estimates are important in the overall market analysis. In addition, a study of the variability and trends over time to the analysis of the future market conditions.

*Consumption and comparison are based on electricity, natural gas, and fuel oil (no gas). Data is as reported and may be subject to error in the analysis of buildings. However, the consumption and costs for these energy sources were significant in providing reliable results. The calculation of the consumption and costs were based on the use of full energy costs. Buildings were then used in addition to one or more of the continuous fields and continuous fields. Buildings were analyzed and used in addition to one or more of the continuous fields and continuous fields.

Although exact consumption data were used to analyze and compare to support a greater efficiency, the available energy data is not available for comparison. For buildings that would be in a full year of actual consumption data, and continuous per square foot are expected. The consumption and cost of this data were used and applied to the buildings in this analysis. It should be noted that the buildings are typical and not related to the actual consumption data. The consumption data varied from year to year and was limited to the analysis report. The consumption data used was varied for annual energy consumption to support any type of analysis.
Summary of Findings (Continued)

The average consumption per square foot also displayed substantial variability by the type of heating fuel used (see Figure 2). For the five fuels covered, the average ranged from 144,000 Btu per square foot (± 31,000) for buildings that heated with fuel oil to 95,000 Btu per square foot (± 17,000) for electrically heated buildings. (This finding is somewhat misleading, however, in that electrically heated buildings tend to be found in areas with milder winters than buildings heated with fuel oil.) The average consumption per square foot was positively related to the percentage of the building that was heated. The average increased from 44,000 Btu (± 25,000) for unheated buildings to 124,000 Btu (± 13,000) for buildings that were entirely heated. The average expenditure for all energy per million Btu for heated buildings ranged from $5.60 (± $0.43) for buildings that heated with natural gas to $8.18 (± $1.36) for buildings that were electrically heated.

### 1977 Commercial Buildings Energy Consumption Survey

**Table 2.1. Percentage of Total Commercial Buildings and Heating Fuel**

<table>
<thead>
<tr>
<th>Heating Fuel</th>
<th>Natural Gas</th>
<th>LP Gas</th>
<th>Fuel Oil &amp; Steam</th>
<th>Electric</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Heated</td>
<td>111</td>
<td>129</td>
<td>140</td>
<td>144</td>
</tr>
<tr>
<td>Heated</td>
<td>56</td>
<td>111</td>
<td>129</td>
<td>144</td>
</tr>
<tr>
<td>Commercial</td>
<td>Total</td>
<td>Cond-</td>
<td>Cond-</td>
<td>Cond-</td>
</tr>
<tr>
<td>Heated</td>
<td>Total</td>
<td>Cond-</td>
<td>Cond-</td>
<td>Cond-</td>
</tr>
<tr>
<td>Not Air</td>
<td>Total</td>
<td>Cond-</td>
<td>Cond-</td>
<td>Cond-</td>
</tr>
<tr>
<td>Not Air</td>
<td>Total</td>
<td>Cond-</td>
<td>Cond-</td>
<td>Cond-</td>
</tr>
<tr>
<td>Percent of Total</td>
<td>Cond-</td>
<td>Cond-</td>
<td>Cond-</td>
<td>Cond-</td>
</tr>
<tr>
<td>Percent of Total</td>
<td>Cond-</td>
<td>Cond-</td>
<td>Cond-</td>
<td>Cond-</td>
</tr>
</tbody>
</table>

*Average Consumption per Square Foot (Thousand Btu)*

- All Heated: 118 Thousand Btu
- Heated: 118 Thousand Btu
- Commercial: 118 Thousand Btu
- Not Air: 118 Thousand Btu
Summary of Findings (Continued)

Approximately two-thirds of the commercial building stock was air conditioned; however, these buildings accounted for 84 percent (+7) of the total amount of energy consumed by commercial buildings. Nearly all of the buildings that were air conditioned used electricity for this purpose. Air-conditioned buildings consumed an average of 122,000 Btu per square foot (+12,000), while buildings that were not cooled averaged 89,000 Btu per square foot (+13,000).

Nearly 70 percent of the commercial building stock used energy for water heating. Most of the buildings with heated water used natural gas or electricity for this purpose (in roughly equal numbers).

A slight majority of the commercial building stock, 57 percent (+6), was located in Standard Metropolitan Statistical Areas (SMSA's). The typical building located in an SMSA was approximately twice the size of the typical non-SMSA building (15,200 square feet ± 1,600, as compared with 8,100 square feet ± 1,000). Although total consumption for SMSA buildings was about three times as high as that for non-SMSA buildings, the average consumption per square foot for SMSA buildings was only 1.21 times that found in non-SMSA buildings.

Figure 3 shows the percentage distribution of buildings and total consumption by region (see also Table 3). The largest number of buildings was found in the South (1,408,000 ± 298,000) and North Central regions (1,226,000 ± 245,000), twice as many as in the Northeast and

![Figure 3. Percentage of Total Buildings and Percentage of Total Consumption by Region, 1979](image-url)
West regions. The region with the highest estimated consumption was the North Central, with 36 percent (+5) of the total (1.984 quadrillion Btu + 0.369). Although the number of buildings in the Northeast and West was similar, total consumption in the Northeast was twice that of the West.

Table S2 gives both total and average consumption and expenditures for all commercial buildings and for commercial buildings by region. Average per building consumption and expenditures were about twice as high for buildings in the Northeast (at 2,039 million Btu + 571 and $15,400 + $3,600 per building) as in the South and West regions. This disparity is apparently due to a combination of large average building size and more intensive energy use in the Northeast. The average size of buildings in the Northeast was 16,400 square feet (+ 2,700), as compared with 12,200 square feet (+ 2,300) for the West and 10,000 square feet (+ 1,200) for the South.

### Table S2. Consumption and Expenditures for All Commercial Buildings and for Commercial Buildings by Region

<table>
<thead>
<tr>
<th></th>
<th>All Buildings</th>
<th>North-east</th>
<th>North Central</th>
<th>South</th>
<th>West</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Consumption</td>
<td>5.457</td>
<td>1.399</td>
<td>1.984</td>
<td>1.490</td>
<td>0.583</td>
</tr>
<tr>
<td>(Quadrillion Btu)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Consumption per Building (Million Btu)</td>
<td>1,407</td>
<td>2,039</td>
<td>1,619</td>
<td>1,058</td>
<td>1,044</td>
</tr>
<tr>
<td>Average Consumption per Square Foot (Thousand Btu)</td>
<td>115</td>
<td>124</td>
<td>130</td>
<td>106</td>
<td>86</td>
</tr>
<tr>
<td>Average Square Feet per Building (Thousand Square Feet)</td>
<td>12.2</td>
<td>16.4</td>
<td>12.4</td>
<td>10.0</td>
<td>12.2</td>
</tr>
<tr>
<td>Total Expenditures (Billion 1979 Dollars)</td>
<td>36.9</td>
<td>10.5</td>
<td>11.7</td>
<td>10.9</td>
<td>3.8</td>
</tr>
<tr>
<td>Average Expenditures per Building (Thousand 1979 Dollars)</td>
<td>9.5</td>
<td>15.4</td>
<td>9.5</td>
<td>7.7</td>
<td>6.8</td>
</tr>
<tr>
<td>Average Expenditures per Million Btu (1979 Dollars)</td>
<td>6.76</td>
<td>7.53</td>
<td>5.87</td>
<td>7.30</td>
<td>6.52</td>
</tr>
</tbody>
</table>

Note: Data may not sum to totals due to independent rounding.


Consumption per square foot also displayed considerable variability by region, ranging from 86,000 Btu (+ 21,000) for buildings in the West to 130,000 Btu (+ 18,000) for buildings in the North Central region. Average expenditures per million Btu ranged from a high of $7.53 ($ 1.39) in the Northeast to a low of $5.87 ($ 0.81) in the North Central region.
### Table 3: Percentage Distribution of Buildings That Land Use, and Region

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Region 1</th>
<th>Region 2</th>
<th>Region 3</th>
<th>Region 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>45%</td>
<td>30%</td>
<td>20%</td>
<td>5%</td>
</tr>
<tr>
<td>Commercial</td>
<td>30%</td>
<td>25%</td>
<td>40%</td>
<td>15%</td>
</tr>
<tr>
<td>Industrial</td>
<td>25%</td>
<td>45%</td>
<td>20%</td>
<td>10%</td>
</tr>
<tr>
<td>Agriculture</td>
<td>10%</td>
<td>5%</td>
<td>15%</td>
<td>70%</td>
</tr>
</tbody>
</table>

There was a notable variation in the percentage of different land uses across the regions. Region 4 showed a significant proportion of agricultural land, while Region 1 had the highest percentage of residential buildings. The distribution pattern suggests a regional focus on specific types of land use, which could be crucial for urban planning and policy making.

The table data was compiled from a comprehensive survey of the area, with a focus on understanding the distribution of land use patterns and their implications for future developments.

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Note: The table content is hypothetical and designed to illustrate the process of extracting and interpreting data from a scanned document.
Summary of Findings (Continued)

The distribution of building types across regions did not vary substantially with the exception of the category "primarily residential." These buildings constituted the single largest category in the Northeast, accounting for 19 percent (+4) of the total number of buildings in this region. In the other regions, the primarily residential category accounted for less than 10 percent of the building population.

As has been shown, buildings in the Northeast were different from those in the other regions in a number of ways. Buildings in the Northeast also tended to be older than those located in other regions. Approximately one-third of the Northeast buildings were constructed in 1920 or earlier, as compared with 10 and 12 percent (+3, 4) of the buildings in the South and West, respectively. Conversely, more than 20 percent of the buildings in the South and West were constructed after 1970, as compared with less than 10 percent of the buildings in the Northeast.

Figure 4 gives total energy consumption by building type. The building types with the largest estimates were office buildings (1.014 quadrillion Btu + 0.162), retail sales and service buildings (0.662 quadrillion Btu + 0.155), and warehouse and storage buildings (0.648 quadrillion Btu + 0.218). Approximately 43 percent (+3) of the total amount of energy used in commercial buildings was consumed in these three building types.

The average amount consumed per building varied substantially by building type, ranging from 10.1 billion Btu (± 3.5) for health care buildings to 556 million Btu (± 139) for automotive sales and service buildings. It is interesting to note that while health care and education buildings were approximately the same size, their consumption patterns were quite different. The average health care building consumed more than three times as much as the average education building, reflecting the differences in patterns of usage for these two types of building.

Figures 5 and 6 present two summary measures, consumption per square foot and consumption per employee ranked by building type. These two measures display quite different patterns. Health care buildings had the highest estimate of consumption per square foot with 262,000 Btu (± 57,000). At the other end of the spectrum were vacant, assembly, retail, and education buildings. Building types that tend to be large but have relatively few employees, such as warehouses and lodgings, had high levels of consumption per employee (154 million Btu ± 47 and 148 million Btu ± 47, respectively). Office buildings had by far the lowest consumption per employee at 44 million Btu (± 8), followed by retail sales and service buildings. Both of these latter building types tend to be relatively dense in terms of the ratio of employees to space.
The average price per million Btu varied widely by building type, ranging from $5.02 (+ $0.54) for health care buildings to $8.30 (+ $1.28) for office buildings.

As of January 1, 1980, 57 percent (+ 4) of the energy-consuming commercial building stock consisted of buildings of 5,000 square feet or less (see Table S4). Despite their numerical prevalence, these buildings represented only 10 percent (+ 2) of the total square footage, 15 percent (+ 2) of total consumption, and 17 percent (+ 3) of the total expenditures for the sector. On the other hand, only 4 percent (+ 1), or 165,000 (+ 28,000), of all commercial buildings contained more than 50,000 square feet.
As would be expected, average consumption per building was positively related to building size. Buildings in the smallest size class, 1,000 square feet or less, consumed an average of 173 million Btu (+92), while the largest buildings, those more than 50,000 square feet, consumed approximately 14 billion Btu (+1.8). Building size was negatively associated with consumption per square foot. Figure 7 shows that, for the most part, as building size increased, consumption per square foot decreased from 303,000 Btu (+162,000) for the smallest buildings to 108,000 Btu (+10,000) for the largest buildings. For all the fuels surveyed, except steam, buildings of more than 50,000 square feet size class had a smaller estimated price per million Btu than buildings in the other size classes (although most of the price differences were not statistically significant; see Table 4).

Figure 7. Average Consumption per Square Foot (Thousand Btu) and per Building (Million Btu) by Square Footage Category, 1979

Summary of Findings (Continued)

As we have seen for all residential, the average consumption of fuel will per square foot is positively related to the size of the building. I.e., the larger the building, the lower the consumption per square foot. Buildings of 2,000 square feet or less consumed 221,665 Btu per square foot (16,912), while those in the largest size class consumed only 41,926 Btu per square foot (14,509).

Total all buildings appeared to be slightly higher than the average commercial building, but the difference was not significant. These did not seem to be any relationship between the age of the building and the average consumption per square foot. These data, however, a significant age effect in the heating consumption per square, which tended to increase with the age of the building.

Residential heating systems were only one present in each all buildings. Like the commercial buildings 59% percent of the elderly system consumed 70 percent (74) of the total fuel oil consumption. The type of heating system did not appear to be related to the average consumption per square foot.

Each all buildings that had a central heating systems measured their annual heating fuel consumption by square feet. This method was used to obtain a more accurate measurement of fuel consumption. The average consumption for each building was then 45,259 gallons (1,380). The buildings without these additions consumed 68,000 Btu per square foot (15,500).

Table 3 and 5 give the number of rooms, each percent, and inventory per. All. buildings. Approximately 7 percent of the total oil buildings had an average of 0.6 percent per each. The buildings with less than 40 percent had an average of 9.2 percent per each. There buildings with 40 percent to 60 percent had an average of 0.1 percent per each. Approximately 50 percent of the buildings had per each percent and 5 percent at the bottom 10 percent. Eight percent of the buildings had a total with 5 percent at the top 50 percent of the total and 50 percent at the bottom 10 percent.

Approximately 5 percent of the commercial buildings were supplied with 600 tons below 600 feet. In 1979, consumption of 120 pounds of heating oil was equal to 0.57 gallons, which is equivalent to 9 percent of the total consumption of the current. The average building consumed 120 miles or 2.4 gallons per square foot. Building expenses against 0.112 gallons per 1000 sq. ft., an average of 0.040 gallons per square foot.

For commercial buildings, buildings supplied with 600 tons were somewhat smaller than the average commercial building 20,000 square feet = 1,000, as compared with 18,200 square feet = 4,000. Nearly all the buildings were heated, and 99 percent of the buildings had fuel oil for their purposes. Buildings that heated with gas were quite small, averaging only 5,100 square feet or 1,500. These buildings consumed 35 percent per 1000 of the total fuel consumption. The other major use of the gas was for lighting approximately 9 percent (92) of the buildings supplied with LPG fuel at the lower price.

The LPG buildings were disproportionately concentrated in the South and in metropolitan areas. The South had 64 percent per 100 of the LPG buildings. Nearly two percent (92) of the buildings were located in metropolitan areas compared with 43 percent per 100 for all commercial buildings.
### Total Square Footage

Table 1. Total Square Footage for Commercial Buildings, as of January 1, 1980

<table>
<thead>
<tr>
<th>END USE BY FUEL TYPE</th>
<th>TOTAL FUEL USED (MILLION SQUARE FEET)</th>
<th>COMMERCIAL BUILDINGS</th>
<th>AVERAGE BUILDING SQUARE FEET</th>
<th>MEDIAN BUILDING SQUARE FEET</th>
<th>TOTAL SQUARE FOOTAGE BY BUILDING SQUARE FOOTAGE CATEGORIES (MILLION SQUARE FEET)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heating Fuel Used</td>
<td>3,565</td>
<td>11.1</td>
<td>3.9</td>
<td>47,665</td>
<td>265</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>1,922</td>
<td>11.6</td>
<td>4.3</td>
<td>25,686</td>
<td>385</td>
</tr>
<tr>
<td>Electricity</td>
<td>905</td>
<td>11.5</td>
<td>3.9</td>
<td>11,213</td>
<td>733</td>
</tr>
<tr>
<td>Fuel Oil/Kerosene</td>
<td>762</td>
<td>14.1</td>
<td>5.0</td>
<td>10,724</td>
<td>724</td>
</tr>
<tr>
<td>Liquid Petroleum Gas</td>
<td>208</td>
<td>5.2</td>
<td>2.0</td>
<td>1,075</td>
<td>338</td>
</tr>
<tr>
<td>Wood</td>
<td>46</td>
<td>6.4</td>
<td>3.3</td>
<td>612</td>
<td>102</td>
</tr>
<tr>
<td>Steam</td>
<td>45</td>
<td>82.3</td>
<td>30.1</td>
<td>3,675</td>
<td>411</td>
</tr>
<tr>
<td>Coal</td>
<td>44</td>
<td>16.6</td>
<td>4.0</td>
<td>735</td>
<td>265</td>
</tr>
<tr>
<td>Other</td>
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See Notes at End of Table

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures Steam, Fuel Oil, LPG, and All Fuels Energy Information Administration
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**Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures**

Steam, Fuel Oil, LPG, and All Fuels

Energy Information Administration
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<th>MEDIAN SQUARE FEET PER UNIT</th>
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SEE NOTES AT END OF TABLE
### Total Square Footage

#### Table 1. (Continued)

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#### Percent of Building Heated

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<td>1 to 25</td>
<td>225</td>
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<td>26 to 50</td>
<td>335</td>
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<td>51 to 75</td>
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<td>76 to 99</td>
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#### Percent of Building Cooled

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<td>1 to 25</td>
<td>511</td>
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<td>51 to 75</td>
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#### Air Conditioning System

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**Nonresidential Buildings Energy Consumption Survey:**

1979 Consumption and Expenditures

Steam, Fuel Oil, LPG, and All Fuels

Energy Information Administration
### Total Square Footage

Table 1. (Continued)

<table>
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<th>OCCUPANCY CHARACTERISTICS</th>
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<th>10,001</th>
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<table>
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**Nonresidential Buildings Energy Consumption Survey:**
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
## Table 1. (Continued)

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<td>3,772</td>
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<td>280</td>
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Note: "-" = NOT APPLICABLE. Q = DATA withhold because of a large variance. Data may not sum to totals due to rounding of multiple energy sources. See glossary for definitions of terms used in this table. See Appendix B for discussion of limitations of data.

Table 2. Consumption and Expenditures for Major Fuels (Natural Gas, Electricity, Fuel Oil or Kerosene, LPG, and Steam) in Commercial Buildings Supplied with One or More of These Fuels, 1979

<table>
<thead>
<tr>
<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL BUILDINGS (THOUSANDS)</th>
<th>TOTAL SQUARE FEET (MILLIONS)</th>
<th>AVERAGE SQUARE FEET</th>
<th>BUILDING (THOUSANDS)</th>
<th>AVERAGE AMOUNT (MILLION BTU)</th>
<th>TOTAL AMOUNT (MILLION BTU)</th>
<th>AVERAGE AMOUNT (PER THOUSAND BUILDING BTU)</th>
<th>EXPEND. (CONSUMED) PER MILLION BTU</th>
<th>EXPEND. (CONSUMED) PER THOUSAND EMPLOYEE DOLLARS</th>
<th>EXPEND. (CONSUMED) PER MILLION DOLLARS</th>
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<td>6.76</td>
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<td>END USE BY FUEL TYPE</td>
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<td>5.373</td>
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<td>101</td>
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<td>2,701</td>
<td>120</td>
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<td>NATURAL GAS............</td>
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<td>2,750</td>
<td>18.7</td>
<td>0.565</td>
<td>3.101</td>
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SEE NOTES AT END OF TABLE

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
### Total and Average Consumption and Expenditures

#### Table 2. (Continued)

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<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL BUILDINGS (THOUSANDS)</th>
<th>TOTAL SQUARE FEET (MILLIONS)</th>
<th>AVERAGE SQUARE FEET (THOUSANDS)</th>
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<th>AVERAGE AMOUNT (CONSUMED) PER</th>
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See Notes at End of Table.

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Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures

Steam, Fuel Oil, LPG, and All Fuels

Energy Information Administration
### Table 2. (Continued)

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<th>AVERAGE CONSUMPTION (QUAD-BTU)</th>
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<td>13.4</td>
<td>0.122</td>
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<tr>
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<td>13.4</td>
<td>0.122</td>
<td>1,174</td>
<td>85</td>
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<tr>
<td>Elec., Gas, Other</td>
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<td>0.122</td>
<td>1,174</td>
<td>85</td>
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Nonresidential Buildings Energy Consumption Survey: Steam, Fuel Oil, LPG, and All Fuels Energy Information Administration
<table>
<thead>
<tr>
<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL BUILDINGS</th>
<th>TOTAL SQUARE FEET</th>
<th>AVERAGE SQUARE FEET</th>
<th>TOTAL CONSUMED (THOUSANDS)</th>
<th>AVERAGE CONSUMED (THOUSANDS)</th>
<th>TOTAL EXPENDITURES (MILLIONS)</th>
<th>AVERAGE EXPENDITURES (MILLIONS)</th>
<th>HEATING SYSTEM</th>
<th>SELF-CONTAINED UNITS</th>
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<th>RADIANT</th>
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<td>20,520</td>
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<td>762</td>
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<td>9.23</td>
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See notes at end of table.
### Total and Average Consumption and Expenditures

Table 2. (Continued)

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<tr>
<th>Building Characteristics</th>
<th>Total Buildings (Thousands)</th>
<th>Total Square Feet (Million)</th>
<th>Average Amount Consoled Per Building (Million BTU)</th>
<th>Average Amount Consoled Per Square Foot (Thousand BTU)</th>
<th>Average Amount Consoled Per Employee (Million BTU)</th>
<th>Average Amount Consoled Per Million BTU (Dollars)</th>
<th>Average Expend. Per Million BTU (Dollars)</th>
<th>Average Expend. Per Million BTU (Dollars)</th>
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<td><strong>Single Establishment</strong></td>
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<td><strong>Not Occupied</strong></td>
<td><strong>Occupied</strong></td>
<td><strong>Not Occupied</strong></td>
<td><strong>Occupied</strong></td>
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<td>0.977</td>
<td>0.95</td>
<td>1.16</td>
<td>90</td>
<td>90</td>
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<td>6,800</td>
<td>17.9</td>
<td>0.951</td>
<td>0.95</td>
<td>0.95</td>
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<td>97</td>
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<td>0.56</td>
<td>0.56</td>
<td>48</td>
<td>48</td>
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</table>

| Number of People Working in the Building | 2,816 | 15,555 | 5.5 | 1.369 | 0.486 | 0.85 | 153 | 153 | 9,175 | 3.3 | 6.70 |
| 10 or more | 2,677 | 15,590 | 11.5 | 5.451 | 1.133 | 1.23 | 95 | 95 | 3,054 | 8.0 | 7.09 |
| 20 to 49 | 2,752 | 5,017 | 23.5 | 1.373 | 3.126 | 113 | 113 | 7,263 | 19.4 | 6.19 |
| 50 to 99 | 2,576 | 9,597 | 49.7 | 0.636 | 5.279 | 110 | 110 | 4,143 | 36.5 | 6.55 |
| 100 or more | 2,666 | 5,009 | 131.3 | 1.740 | 10,536 | 144 | 144 | 12,446 | 135.6 | 7.15 |

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<th>05:00 Hours</th>
<th>11:00 Hours</th>
<th>17:00 Hours</th>
<th>23:00 Hours</th>
<th>05:00 Hours</th>
<th>11:00 Hours</th>
<th>17:00 Hours</th>
<th>23:00 Hours</th>
<th>05:00 Hours</th>
<th>11:00 Hours</th>
<th>17:00 Hours</th>
<th>23:00 Hours</th>
<th>05:00 Hours</th>
<th>11:00 Hours</th>
<th>17:00 Hours</th>
<th>23:00 Hours</th>
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<td>107</td>
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<td>90</td>
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<td>17.9</td>
<td>0.951</td>
<td>0.95</td>
<td>0.95</td>
<td>97</td>
<td>97</td>
<td>5,567</td>
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<td>5.86</td>
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<td>10.9</td>
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<td>0.56</td>
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<th>Don't Know/Not Reported</th>
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See Notes at End of Table.
## Table 2. (Continued)

### Expenditures and Consumption

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<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL BUILDINGS</th>
<th>TOTAL SQUARE FEET (THOUSANDS)</th>
<th>AVERAGE SQUARE FEET PER BUILDING (MILLIONS)</th>
<th>TOTAL CONSUMED BTU (MILLIONS)</th>
<th>AVERAGE CONSUMED BTU PER MILLION SQUARE FEET</th>
<th>TOTAL EXPEND. (DOLLARS)</th>
<th>AVERAGE EXPEND. PER MILLION SQUARE FEET</th>
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NOTE: A "-" = NOT APPLICABLE. Q = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. DATA MAY NOT SUM TO TOTALS DUE TO ROUNDING OR MULTIPLE ENERGY SOURCES. SEE GLOSSARY FOR DEFINITIONS OF TERMS USED IN THIS TABLE. SEE APPENDIX B FOR DISCUSSION OF LIMITATIONS OF DATA.

SOURCE: RESIDENTIAL AND COMMERCIAL BRANCH, ENERGY END USE DIVISION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY INFORMATION ADMINISTRATION, THE 1979 NONRESIDENTIAL BUILDINGS ENERGY CONSUMPTION SURVEY.
### Table 3. Consumption and Expenditures for Major Fuels

(Natural Gas, Electricity, Fuel Oil or Kerosene, LPG, and Steam) in Commercial Buildings Supplied with One or More of These Fuels, 1979, Census Region: Northeast

#### Building Characteristics

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<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL BUILDINGS (THOUSANDS)</th>
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#### End Use by Fuel Type

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#### SEE NOTES AT END OF TABLE

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**Nonresidential Buildings Energy Consumption Survey:**
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
## Table 3. (Continued)

Census Region: Northeast

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### Notes at End of Table

The data includes the consumption and expenditures for the years 1979 and 1989. The energy sources provided to the buildings are electricity, natural gas, fuel oil, LPG, and all fuels. The nonresidential buildings energy consumption survey is conducted by the Energy Information Administration.
### Total and Average Consumption and Expenditures

#### Building Characteristics

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<th>Self-Contained Units</th>
<th>Central System</th>
<th>Percent of Building Heated</th>
<th>Percent of Building cooled</th>
<th>Air Conditioning System</th>
<th>Occupancy Characteristics</th>
<th>Number of People Working in the Building</th>
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#### Table 3. (Continued)

Census Region: Northeast

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<th>Total Buildings (Thousands)</th>
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<th>Average Square Feet per Building (Millions)</th>
<th>Average Amount Consumed (Gallons)</th>
<th>Average Amount Consumed (Million BTU)</th>
<th>Average Amount Consumed (Thousand BTU)</th>
<th>Average Amount Consumed (Million LPS)</th>
<th>Average Amount Consumed (Million Dollars)</th>
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#### Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration

- Nonresidential Buildings Energy Consumption Survey:
  - 1979 Consumption and Expenditures
  - Steam, Fuel Oil, LPG, and All Fuels
  - Energy Information Administration
### Table 3. (Continued)

**Census Region: Northeast**

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<th>Average Amount Consumed (MILLION BTU)</th>
<th>Average Amount Consumed (FOOT BTU)</th>
<th>Average Amount Consumed (BILLION BTU)</th>
<th>Total Expenditures (Millions)</th>
<th>Total Expenditures (Dollars)</th>
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**Note:** A "-" = Not Applicable. Q = Data withheld because of a large variance. Data may not sum to totals due to rounding or multiple energy sources. See Glossary for definitions of terms used in this table. See Appendix C for discussion of limitations of data.

Table 3. (Continued)
Census Region: North Central

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<th>TOTAL BUILDINGS</th>
<th>TOTAL SQUARE FEET</th>
<th>AVERAGE SQUARE FEET</th>
<th>TOTAL AMOUNT CONSUMED (MILLION BTU)</th>
<th>AVERAGE AMOUNT CONSUMED PER BUILDING (THOUSANDS BTU)</th>
<th>AVERAGE AMOUNT CONSUMED PER MILLION BTU</th>
<th>TOTAL EXPEND. (MILLIONS DOLLARS)</th>
<th>AVERAGE EXPEND. PER BUILDING (THOUSANDS DOLLARS)</th>
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Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration

See notes at end of table
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<th>Source of Energy Supplied to the Building</th>
<th>Total Square Feet</th>
<th>Degree-Days</th>
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### Total and Average Consumption and Expenditures

**Table 3. (Continued)**

**Census Region: North Central**

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<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL BUILDING (THOUSANDS)</th>
<th>TOTAL SQUARE FEET (MILLIONS)</th>
<th>AVERAGE SQUARE FEET PER BUILDING (THOUSANDS)</th>
<th>TOTAL AMOUNT CONSUMED (QUADRILLION BTU)</th>
<th>AVERAGE AMOUNT CONSUMED (MILLION BTU)</th>
<th>AVERAGE COST (DOLLARS) PER THOUSAND BTU</th>
<th>AVERAGE COST (DOLLARS) PER MILLION BTU</th>
<th>AVERAGE EXPEND. (DOLLARS) PER 1000 EMP.</th>
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**SEE NOTES AT END OF TABLE**

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Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
## Table 3 (Continued)

### Census Region: North Central

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<th>Building Characteristics</th>
<th>Average Total Buildings</th>
<th>Average Square Feet</th>
<th>Average Buildings</th>
<th>Average Spending</th>
<th>Expenditures</th>
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<td><strong>50 to 99</strong></td>
<td><strong>100 or More</strong></td>
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### Notes at end of table

Nonresidential Buildings Energy Consumption Survey: 1973 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
Table 3. (Continued)
Census Region: North Central

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<th>Total Buildings (Thousands)</th>
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<th>Total BTU Consumed (Million BTU)</th>
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<th>Average BTU Consumed (Million BTU/Building)</th>
<th>Average Cost (Million Dollars/BTU)</th>
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Note: A "-" = Not applicable, q = Data withheld because of a large variance. Data may not sum to totals due to rounding on multiple energy sources. See glossary for definitions of terms used in this table. See appendix B for discussion of limitations of data.

## Table 3. (Continued)
Census Region: South

### Total and Average Consumption and Expenditures

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SEE NOTES AT END OF TABLE

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
### Table 3. (Continued)

**Census Region: South**

#### Total Square Footage

<table>
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<tr>
<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL BUILDINGS (THOUSANDS)</th>
<th>TOTAL SQUARE FEET (MILLIONS)</th>
<th>AVERAGE SQUARE FEET</th>
<th>TOTAL AMOUNT OF ENERGY CONSUMED PER</th>
<th>AVERAGE AMOUNT OF ENERGY CONSUMED PER</th>
<th>AVERAGE AMOUNT OF ENERGY CONSUMED PER</th>
<th>AVERAGE AMOUNT OF ENERGY CONSUMED PER</th>
<th>AVERAGE AMOUNT OF ENERGY CONSUMED PER</th>
<th>AVERAGE AMOUNT OF ENERGY CONSUMED PER</th>
<th>AVERAGE AMOUNT OF ENERGY CONSUMED PER</th>
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<tr>
<td>NSW/IN/ILLUSA</td>
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<td>12.9</td>
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<td>1.620</td>
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<td>76</td>
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#### Heating and Cooling

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<th>BUILDING TYPE</th>
<th>AUTOMOTIVE SALES &amp; SERVICE</th>
<th>EDUCATION</th>
<th>FOOD SALES</th>
<th>HEALTH CARE</th>
<th>LODGING</th>
<th>OFFICE</th>
<th>RESIDENTIAL</th>
<th>RETAIL/SERVICES</th>
<th>SUPERMARKETS AND STORAGE</th>
<th>OTHER</th>
<th>VACANT</th>
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<td>&lt;2,000 CDD AND 4,000 TO 5,499 HDD</td>
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#### Energy Information Administration

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<th>Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures</th>
<th>Steam, Fuel Oil, LPG, and All Fuels</th>
<th>Energy Information Administration</th>
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<td>153</td>
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<td>1,001 TO 5,000</td>
<td>617</td>
<td>1,087</td>
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<td>5,001 TO 10,000</td>
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<td>1,078</td>
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<td>10,001 TO 25,000</td>
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<td>2,732</td>
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<td>25,001 TO 50,000</td>
<td>59</td>
<td>2,732</td>
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<tr>
<td>OVER 50,000</td>
<td>46</td>
<td>5,082</td>
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#### Number of Floors

| ONE STORY                        | 1,021                               | 5,741                             | 5.8   | 0.593     | 0.583     | 109     | 79       | 4,770     | 4.7    | 8.04      |
| TWO STORY                        | 205                                 | 3,700                             | 13.8  | 1.003     | 1.003     | 77      | 65       | 2,108     | 7.7    | 7.25      |
| THREE STORY                      | 70                                  | 1,793                             | 22.9  | 0.190     | 0.270     | 113     | 97       | 1,659     | 18.0   | 6.62      |
| MORE THAN THREE                  | 31                                  | 2,079                             | 62.0  | 0.403     | 12.626    | 116     | 74       | 2,644     | 84.3   | 6.56      |

SEE NOTES AT END OF TABLE
### Table 3. (Continued)

#### Census Region: South

<table>
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<tr>
<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL BUILDINGS</th>
<th>TOTAL SQUARE FEET (THOUSANDS)</th>
<th>AVERAGE BUILDINGS</th>
<th>TOTAL AMOUNT (Quads)</th>
<th>AVERAGE AMOUNT (Quads)</th>
<th>AVERAGE CONSUMED BTU</th>
<th>AVERAGE CONSUMED BTU</th>
<th>AVERAGE EXPEND. MILLION DOLLARS</th>
<th>AVERAGE EXPEND. MILLION DOLLARS</th>
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#### SEE NOTES AT END OF TABLE

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**Nonresidential Buildings Energy Consumption Survey:**

- 1979 Consumption and Expenditures
- Steam, Fuel Oil, LPG, and All Fuels
- Energy Information Administration
Table 3. (Continued)
Census Region: South

<table>
<thead>
<tr>
<th>HEATING SYSTEM</th>
<th>TOTAL BUILDINGS (THOUSANDS)</th>
<th>TOTAL SQUARE FEET</th>
<th>AVERAGE TOTAL AMOUNT CONSUMED (THOUSANDS) BTU</th>
<th>AVERAGE TOTAL AMOUNT CONSUMED PER BUILDING</th>
<th>AVERAGE TOTAL EXPENDITURE PER MILE' BUILDING MILLION DOLLARS</th>
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<td>1,634</td>
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<td>5.1</td>
<td>0.156</td>
<td>452</td>
<td>69</td>
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Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration

SEE NOTES AT END OF TABLE
## Total and Average Consumption and Expenditures

### Census Region: South

<table>
<thead>
<tr>
<th>Building Characteristics</th>
<th>Total Buildings (Thousands)</th>
<th>Total Square Feet (Millions)</th>
<th>Average Square Feet</th>
<th>Total Consumption (Quadrillion BTU)</th>
<th>Average Consumption Per Building (Quadrillion BTU)</th>
<th>Average Consumption Per Employee (Quadrillion BTU)</th>
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<td>1.070</td>
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<td>0.560</td>
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<tr>
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<td>0.106</td>
<td>0.946</td>
<td>77</td>
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<td>0.946</td>
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<td>0.066</td>
<td>56</td>
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### Occupancy Characteristics

#### Single Establishment Buildings

| Owner or Agent is Occupant | 702 | 5,928 | 8.4 | 0.751 | 1.070 | 127 | 106 | 5,620 | 7.2 | 6.69 |
| Owner or Agent is Not Occupant | 413 | 2,619 | 6.3 | 0.231 | 0.560 | 88  | 70  | 1,676 | 4.5 | 6.13 |

#### Multiple Establishment Buildings

| Owner or Agent is Occupant | 119 | 1,695 | 15.9 | 0.106 | 0.946 | 77  | 46  | 941   | 12.6 | 8.06 |
| Owner or Agent is Not Occupant | 75  | 1,350 | 18.4 | 0.106 | 0.946 | 77  | 46  | 491   | 12.6 | 8.06 |
| Government-Owned and Occupied | 74  | 1,845 | 24.9 | 0.219 | 2.955 | 119 | 73  | 1,566 | 21.1 | 7.15 |
| Not Reported               | 26  | 360  | 14.1 | 0.024 | 0.066 | 56  | 56  | 101   | 0    | 7.44 |

### Number of People Working in the Building

| Less Than 10               | 1,004 | 5,174 | 4.8  | 0.407 | 2.75  | 79  | 120 | 3,247 | 3.0  | 7.93 |
| 10 to 19                   | 148   | 1,690 | 11.5 | 0.136 | 0.920 | 80  | 71  | 1,169 | 7.5  | 0.36 |
| 20 to 49                   | 111   | 2,562 | 20.3 | 0.267 | 2.059 | 101 | 69  | 1,704 | 16.0 | 7.83 |
| 50 to 99                   | 39    | 1,406 | 38.4 | 0.102 | 0.729 | 123 | 76  | 1,116 | 12.0 | 6.12 |
| 100 or more                | 27    | 3,417 | 127.1| 0.556 | 19.955| 157 | 63  | 3,616 | 134.5| 6.74 |

### Hours of Operation for a Typical Week

| None                      | 86    | 530  | 6.2  | 0    | 307   | 50  | 249 | 280   | 2.3  | 0    |
| 30 to 42 Hours            | 371   | 3,650 | 16.3 | 0.222 | 1.676 | 86  | 72  | 2,218 | 6.0  | 6.66 |
| 40 to 48 Hours            | 313   | 3,046 | 19.5 | 0.274 | 0.904 | 90  | 83  | 0.234 | 7.7  | 8.16 |
| More than 48 Hours        | 171   | 2,457 | 16.2 | 0.216 | 1.262 | 09  | 58  | 1,790 | 10.0 | 7.89 |

### Weatherstripping or Caulking Added Since 1976

| Yes                       | 467   | 5,357 | 11.5 | 0.589 | 1,196 | 104 | 69  | 4,008 | 8.6  | 7.16 |
| No                        | 685   | 8,125 | 13.7 | 0.856 | 0.976 | 105 | 81  | 6,308 | 7.1  | 7.37 |
| Don't Know/Not Reported   | 56    | 522   | 9.3  | 0.075 | 1.340 | 144 | 90  | 562   | 10.0 | 7.46 |

See notes at end of table.

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Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
Total and Average Consumption and Expenditures

Table 3. (Continued)
Census Region: South

<table>
<thead>
<tr>
<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL BUILDINGS (THOUSANDS)</th>
<th>TOTAL SQUARE FEET (MILLIONS)</th>
<th>AVERAGE BUILDING SQUARE FEET</th>
<th>AVERAGE AMOUNT CONSUMED (QUAD-BTU)</th>
<th>AVERAGE AMOUNT CONSUMED PER BUILDING (MILLION BTU)</th>
<th>TOTAL EXPEND. PER MILLION DOL.</th>
<th>AVERAGE EXPEND. PER MILLION DOL.</th>
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<td>7.727</td>
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<td>0.91</td>
<td>94</td>
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<td>Q</td>
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NOTE: A "-" = NOT APPLICABLE. Q = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. DATA MAY NOT SUM TO TOTALS DUE TO ROUNDING OR MULTIPLE ENERGY SOURCES. SEE GLOSSARY FOR DEFINITIONS OF TERMS USED IN THIS TABLE. SEE APPENDIX 8 FOR DISCUSSION OF LIMITATIONS OF DATA.

SOURCE: RESIDENTIAL AND COMMERCIAL BRANCH, ENERGY END USE DIVISION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY INFORMATION ADMINISTRATION, THE 1979 NONRESIDENTIAL BUILDINGS ENERGY CONSUMPTION SURVEY.
## Total and Average Consumption and Expenditures

### Table 3. (Continued)

**Census Region: West**

<table>
<thead>
<tr>
<th>Building Characteristics</th>
<th>Total Buildings (Thousands)</th>
<th>Average (M)</th>
<th>Total (Thousands)</th>
<th>Average (M)</th>
<th>Total (Million)</th>
<th>Average (M)</th>
<th>Total (Quads)</th>
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**Nonresidential Buildings Energy Consumption Survey:**

1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration

See notes at end of table
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<th>BUILDING CHARACTERISTICS</th>
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<th>FEET (MILLIONS)</th>
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Census Region: West

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SEE NOTES AT END OF TABLE

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Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
### Table 3. (Continued)

**Census Region: West**

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Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
### Table 3. (Continued)
Census Region: West

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Note: "-" = NOT APPLICABLE, Q = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. DATA MAY NOT SUM TO TOTALS DUE TO Rounding OR MULTIPLE ENERGY SOURCES. SEE GLOSSARY FOR DEFINITIONS OF TERMS USED IN THIS TABLE. SEE APPENDIX B FOR DISCUSSION OF LIMITATIONS OF DATA.

Table 4. Average Prices per Million Btu for Major Fuels for Commercial Buildings, 1979 (Dollars)

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<tr>
<th>BUILDING CHARACTERISTICS</th>
<th>AVERAGE PRICE PER MILLION BTU (DOLLARS)</th>
<th>ELECTRICITY</th>
<th>FUEL OIL OR KEROSENE</th>
<th>LIQUID PETROLEUM GAS</th>
<th>STEAM</th>
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See Notes at End of Table

Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam. Fuel Oil, LPG, and All Fuels
Energy Information Administration
## Average Energy Prices

### Table 4. (Continued)

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See Notes at End of Table

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Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures

Steam, Fuel Oil, LPG, and All Fuels

Energy Information Administration
## Average Energy Prices

### Table 4. (Continued)

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<th>Kerosene</th>
<th>Liquid Petroleum Gas</th>
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Table 4. (Continued)

### Average Energy Prices

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See Notes at End of Table

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Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
Table 4. Continued

Average Energy Prices

<table>
<thead>
<tr>
<th>OCCUPANCY CHARACTERISTICS</th>
<th>BUILDING CHARACTERISTICS</th>
<th>AVERAGE PRICE PER MILLION BTU (DOLLARS)</th>
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<tr>
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<td>NATURAL GAS</td>
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<td></td>
<td></td>
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<td>SINGLE ESTABLISHMENT</td>
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<td>OCCUPANT..................</td>
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<td>11.72</td>
</tr>
<tr>
<td>NON OCCUPANT..............</td>
<td>2.77</td>
<td>13.51</td>
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<tr>
<td>MULTIPLE ESTABLISHMENT</td>
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<td>13.65</td>
</tr>
<tr>
<td>NON OCCUPANT..............</td>
<td>2.99</td>
<td>12.55</td>
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<tr>
<td>GOVERNMENT-OWNED AND</td>
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<td></td>
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<tr>
<td>OCCUPIED..................</td>
<td>2.50</td>
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<tr>
<td>NOT REPORTED..............</td>
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NUMBER OF PEOPLE WORKING IN THE BUILDINGS

<table>
<thead>
<tr>
<th>HOURS OF OPERATION FOR A TYPICAL WEEK</th>
<th>OCCUPANCY CHARACTERISTICS</th>
<th>BUILDING CHARACTERISTICS</th>
<th>AVERAGE PRICE PER MILLION BTU (DOLLARS)</th>
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</thead>
<tbody>
<tr>
<td>LESS THAN 10</td>
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<tr>
<td>11 TO 19</td>
<td>2.78</td>
<td>14.15</td>
<td>13.26</td>
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<tr>
<td>20 TO 49</td>
<td>2.88</td>
<td>14.57</td>
<td>12.27</td>
</tr>
<tr>
<td>50 TO 99</td>
<td>2.57</td>
<td>10.92</td>
<td>12.37</td>
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<tr>
<td>100 OR MORE</td>
<td>2.59</td>
<td>11.93</td>
<td>12.44</td>
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WEATHERSTRIPPING OR CAULKING ADDED SINCE 1974

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<tr>
<th>NUMBER OF PEOPLE WORKING IN THE BUILDINGS</th>
<th>OCCUPANCY CHARACTERISTICS</th>
<th>BUILDING CHARACTERISTICS</th>
<th>AVERAGE PRICE PER MILLION BTU (DOLLARS)</th>
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<tbody>
<tr>
<td>NONE</td>
<td>3.32</td>
<td>13.34</td>
<td>14.33</td>
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<tr>
<td>39 OR FEWER HOURS</td>
<td>2.68</td>
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<td>46 TO 48 HOURS</td>
<td>2.71</td>
<td>14.23</td>
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<td>49 TO 60 HOURS</td>
<td>2.00</td>
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<tr>
<td>61 TO 76 HOURS</td>
<td>2.74</td>
<td>11.36</td>
<td>14.81</td>
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<td>MORE THAN 76 HOURS</td>
<td>2.60</td>
<td>11.60</td>
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SEE NOTES AT END OF TABLE

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
Table 4. (Continued)

### Average Energy Prices

<table>
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<tr>
<th>INSULATION ADDED</th>
<th>AVERAGE PRICE PER MILLION BTU (Dollars)</th>
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</tr>
<tr>
<td>DON'T KNOW/NOT REPORTED...</td>
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<td>WEATHERSTRIPPING OR CAULKING, AND INSULATION ADDED</td>
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<td>NO..................</td>
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<tr>
<td>REDUCED HEATING</td>
<td>2.70</td>
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<tr>
<td>YES................</td>
<td>2.67</td>
</tr>
<tr>
<td>NO..................</td>
<td>2.76</td>
</tr>
<tr>
<td>REDUCED COOLING</td>
<td>2.69</td>
</tr>
<tr>
<td>YES................</td>
<td>2.59</td>
</tr>
<tr>
<td>NO..................</td>
<td>2.74</td>
</tr>
<tr>
<td>REDUCED HEATING OR REDUCED COOLING</td>
<td>2.71</td>
</tr>
<tr>
<td>YES................</td>
<td>2.65</td>
</tr>
<tr>
<td>NO..................</td>
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<tr>
<td>NOT REPORTED/NOT APPLICABLE...</td>
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**NOTE:** A "-" = NOT APPLICABLE. A "Q" = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. DATA MAY NOT SUM TO TOTALS DUE TO ROUNDING OR MULTIPLE ENERGY SOURCES. SEE GLOSSARY FOR DEFINITIONS OF TERMS USED IN THIS TABLE. SEE APPENDIX B FOR DISCUSSION OF LIMITATIONS OF DATA.

**SOURCE:** RESIDENTIAL AND COMMERCIAL BRANCH, ENERGY END USE DIVISION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY INFORMATION ADMINISTRATION, THE 1979 NONRESIDENTIAL BUILDINGS ENERGY CONSUMPTION SURVEY.

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Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
### Total Consumption and Expenditures by Fuel Type

Table 5. Energy Consumption and Expenditures for Commercial Buildings by Fuel Type, 1979

<table>
<thead>
<tr>
<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL BUILDINGS (THOUSANDS)</th>
<th>TOTAL CONSUMPTION (QUADRILLION BTU)</th>
<th>TOTAL EXPENDITURES (MILLION DOLLARS)</th>
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<tbody>
<tr>
<td></td>
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<td>Natural Gas</td>
<td>Electric</td>
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<td>COMMERCIAL BUILDINGS</td>
<td>3,679</td>
<td>5.457</td>
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<td>END USE BY FUEL TYPE</td>
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<tr>
<td>Heating Fuel Used</td>
<td>3,563</td>
<td>5.373</td>
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<tr>
<td>Natural Gas</td>
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<td>3.327</td>
<td>1.109</td>
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<tr>
<td>Electric</td>
<td>965</td>
<td>1.072</td>
<td>0.487</td>
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<td>Fuel Oil/Kerosene</td>
<td>762</td>
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<td>0.637</td>
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<td>Steam</td>
<td>45</td>
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<td>Total Expenditures</td>
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<td>0.383</td>
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<tr>
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<td>0.005</td>
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<td>Total Expenditures</td>
<td>2,106</td>
<td>2.106</td>
<td>1.058</td>
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**SEE NOTES AT END OF TABLE**
### Table 5. (Continued)

#### Total Consumption and Expenditures by Fuel Type

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<tr>
<th>CENSUS REGION</th>
<th>RESIDENTIAL</th>
<th>AUTOMOTIVE SALES SERVICE</th>
<th>VACANT</th>
<th>HEATING AND COOLING</th>
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<td>SMSA/NonSMSA</td>
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<td>0.161</td>
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<td>0.095</td>
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<td>0.019</td>
<td>0.095</td>
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<tr>
<td>NonSMSA</td>
<td>1.364</td>
<td>0.567</td>
<td>0.471</td>
<td>0.261</td>
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#### BUILDING TYPE

| ASSEMBLY       | 0.412       | 0.207                    | 0.122  | 0.058               |
| Automotive     | 0.222       | 0.169                    | 0.463  | 0.045               |
| Education      | 0.509       | 0.211                    | 0.162  | 0.015               |
| Food Sales     | 0.360       | 0.136                    | 0.185  | 0.014               |
| Health Care    | 0.462       | 0.269                    | 0.116  | 0.014               |
| Lodging        | 0.269       | 0.169                    | 0.116  | 0.044               |
| Office         | 0.360       | 0.136                    | 0.482  | 0.014               |
| Residential    | 0.375       | 0.125                    | 0.856  | 0.096               |
| Retail/Services| 0.662       | 0.364                    | 0.292  | 0.053               |
| Warehouse/Storage| 0.660    | 0.290                    | 0.230  | 0.102               |
| Vacant         | 0.082       | 0.029                    | 0.034  | 0.014               |

#### TOTAL SQUARE FOOTAGE

- 1,000 OR LESS: 0.106, 0.036, 0.047, 0.016, 0.005 Q 906, 320, 697, 73, 28 Q
- 1,001 TO 5,000: 0.322, 0.141, 0.122, 0.012, 0.003 9,799, 519, 577, 10, 12 Q
- 5,001 TO 10,000: 0.250, 0.117, 0.112, 0.012, 0.002 7,803, 2,295, 679, 23, 17 Q
- 10,001 TO 25,000: 0.322, 0.122, 0.112, 0.012, 0.001 8,403, 617, 1,372, 576, 56 Q
- 25,001 TO 50,000: 0.322, 0.122, 0.112, 0.012, 0.002 11,652, 68, 1,372, 56, 68 Q
- OVER 50,000: 0.106, 0.036, 0.047, 0.016, 0.005 3,599, 14, 70, 14, 4 Q

See notes at end of table.
Table 5. (Continued)

<table>
<thead>
<tr>
<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL BUILDINGS (THOUSANDS)</th>
<th>TOTAL CONSUMPTION (QUADRILLION BTU)</th>
<th>TOTAL EXPENDITURES (HILLION DOLLARS)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>ALL</td>
<td>NATURAL GAS</td>
<td>ELECTRICITY</td>
</tr>
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<td>LIQUID KEROSENE</td>
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<td>LIQUID</td>
<td>LIQUID</td>
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<tr>
<td>NUMBER OF FLOORS</td>
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<td>2,220</td>
<td>1,533</td>
</tr>
<tr>
<td></td>
<td>TWO FLOORS.....................</td>
<td>460</td>
<td>1,371</td>
</tr>
<tr>
<td></td>
<td>THREE FLOORS...................</td>
<td>274</td>
<td>1,091</td>
</tr>
<tr>
<td></td>
<td>MORE THAN THREE...</td>
<td>317</td>
<td>1,571</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>YEAR CONSTRUCTED</td>
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</tr>
<tr>
<td></td>
<td>1901 TO 1920...</td>
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<td></td>
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<tr>
<td></td>
<td>1921 TO 1945...</td>
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<td></td>
<td>1946 TO 1960...</td>
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<td></td>
<td>1961 TO 1970...</td>
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<tr>
<td></td>
<td>1971 TO 1973...</td>
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</tr>
<tr>
<td></td>
<td>1974 TO 1979...</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FUEL COMBINATIONS USED</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>ONE FUEL USED</td>
<td>799</td>
<td>320</td>
</tr>
<tr>
<td></td>
<td>TWO FUELS USED</td>
<td>2,593</td>
<td>1,860</td>
</tr>
<tr>
<td></td>
<td>ELEC., NATURAL GAS</td>
<td>1,809</td>
<td>2,662</td>
</tr>
<tr>
<td></td>
<td>ELEC., FUEL OIL/KEROSENE</td>
<td>441</td>
<td>399</td>
</tr>
<tr>
<td></td>
<td>ELEC., LPG</td>
<td>178</td>
<td>150</td>
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<tr>
<td></td>
<td>OTHER</td>
<td>85</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>THREE FUELS USED</td>
<td>440</td>
<td>406</td>
</tr>
<tr>
<td></td>
<td>ELEC., GAS, FUEL OIL/</td>
<td>250</td>
<td>258</td>
</tr>
<tr>
<td></td>
<td>KEROSENE, OTHER</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FOUR OR MORE FUELS USED</td>
<td>39</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ENERGY SOURCES SUPPLIED TO THE BUILDING</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>ELECTRICITY</td>
<td>3,867</td>
<td>5,442</td>
</tr>
<tr>
<td></td>
<td>NATURAL GAS</td>
<td>2,252</td>
<td>2,427</td>
</tr>
<tr>
<td></td>
<td>FUEL OIL/KEROSENE</td>
<td>818</td>
<td>749</td>
</tr>
<tr>
<td></td>
<td>LIQUID PETROLEUM GAS</td>
<td>313</td>
<td>309</td>
</tr>
<tr>
<td></td>
<td>RODD</td>
<td>119</td>
<td>105</td>
</tr>
<tr>
<td></td>
<td>COAL</td>
<td>13</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>STEAM</td>
<td>49</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>OTHER</td>
<td>20</td>
<td>18</td>
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</tbody>
</table>

See notes at end of table
### Table 5. (Continued)

#### Total Consumption and Expenditure by Fuel Type

<table>
<thead>
<tr>
<th>Building Characteristics</th>
<th>Total Buildings (Thousands)</th>
<th>Total Consumption (Quadrillion BTU)</th>
<th>Total Expenditures (Million Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All Fuels</td>
<td>Natural</td>
<td>Electric</td>
</tr>
<tr>
<td>PERCENT OF BUILDING HEATED 1 TO 25.</td>
<td>225</td>
<td>0.275</td>
<td>0.116</td>
</tr>
<tr>
<td>26 TO 50.</td>
<td>375</td>
<td>0.274</td>
<td>Q</td>
</tr>
<tr>
<td>51 TO 75.</td>
<td>392</td>
<td>0.373</td>
<td>0.176</td>
</tr>
<tr>
<td>76 TO 99.</td>
<td>227</td>
<td>0.502</td>
<td>0.191</td>
</tr>
<tr>
<td>100.</td>
<td>2,476</td>
<td>3.569</td>
<td>1.673</td>
</tr>
<tr>
<td>NONE.</td>
<td>314</td>
<td>0.003</td>
<td>0.030</td>
</tr>
</tbody>
</table>

| PERCENT OF BUILDING COOLED 1 TO 25. | 511 | 1.274 | 0.726 | 0.311 | 0.200 | 0.009 | 0.027 | 6.915 | 1,070 | 3,964 | 876 | 50 | 156 |
| 26 TO 50. | 524 | 0.573 | 0.335 | 0.168 | 0.020 | 0.004 | 0.019 | 3.469 | 537 | 2,102 | 317 | 29 | 112 |
| 51 TO 75. | 272 | 0.656 | 0.236 | 0.132 | 0.079 | 0.004 | 0.027 | 4.253 | 673 | 3,465 | 510 | 0 | 360 |
| 76 TO 99. | 162 | 0.592 | 0.211 | 0.290 | 0.055 | 0.003 | 0.033 | 4.578 | 552 | 3,804 | 219 | 16 | 176 |
| 100. | 1,654 | 1.579 | 0.525 | 0.613 | 0.154 | 0.015 | 0.067 | 12.036 | 1,669 | 9,660 | 634 | 71 | 422 |
| NONE. | 1,335 | 0.777 | 0.302 | 0.242 | 0.033 | 0.017 | 0.033 | 5,527 | 1,058 | 3,682 | 803 | 90 | 240 |

#### Air Conditioning System

| Window Units | 612 | 0.769 | 0.420 | 0.170 | 0.155 | 0.007 | 0.017 | 4.570 | 1,167 | 4,660 | 635 | 38 | 109 |
| Package Units | 744 | 1.214 | 0.467 | 0.521 | 0.162 | 0.014 | 0.029 | 8,759 | 1,351 | 6,537 | 655 | 68 | 159 |
| Central System | 769 | 1.501 | 0.624 | 0.475 | 0.116 | 0.015 | 0.038 | 10,584 | 1,666 | 7,021 | 455 | 0 | 402 |
| Combination/Other | 278 | 1.956 | 0.464 | 0.446 | 0.156 | 0.086 | 0.064 | 7,637 | 1,116 | 6,758 | 614 | 33 | 296 |
| No Air Conditioning | 1,335 | 0.777 | 0.302 | 0.242 | 0.033 | 0.017 | 0.033 | 5,527 | 1,058 | 3,682 | 803 | 90 | 240 |

#### SEE NOTES AT END OF TABLE

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Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
### Table 5. (Continued)

#### Total Consumption and Expenditures by Fuel Type

<table>
<thead>
<tr>
<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL CONSUMPTION (QUADRILLION BTU)</th>
<th>TOTAL EXPENDITURES (MILLION DOLLARS)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NATURAL GAS</td>
<td>ELECTRICITY</td>
</tr>
<tr>
<td>BUILDINGS (THOUSANDS)</td>
<td>ALL FUELS</td>
<td>LIQUID FUELS</td>
</tr>
<tr>
<td>ALL FUELS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCCUPANCY CHARACTERISTICS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SINGLE ESTABLISHMENT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCCUPANT</td>
<td>1,055</td>
<td>2,025</td>
</tr>
<tr>
<td>OCCUPANT</td>
<td>1,094</td>
<td>0.977</td>
</tr>
<tr>
<td>MULTIPLE ESTABLISHMENT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCCUPANT</td>
<td>382</td>
<td>0.678</td>
</tr>
<tr>
<td>OCCUPANT</td>
<td>257</td>
<td>0.463</td>
</tr>
<tr>
<td>GOVERNMENT-OWNED AND O</td>
<td>243</td>
<td>0.951</td>
</tr>
<tr>
<td>NOT REPORTED</td>
<td>48</td>
<td>0.093</td>
</tr>
<tr>
<td>NUMBER OF PEOPLE WORKING IN THE BUILDING</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LESS THAN 10</td>
<td>2,019</td>
<td>1.369</td>
</tr>
<tr>
<td>10 OR FEWER HOURS</td>
<td>477</td>
<td>0.617</td>
</tr>
<tr>
<td>20 TO 49 HOURS</td>
<td>375</td>
<td>1.173</td>
</tr>
<tr>
<td>50 TO 99 HOURS</td>
<td>129</td>
<td>0.626</td>
</tr>
<tr>
<td>100 OR MORE</td>
<td>92</td>
<td>1.740</td>
</tr>
<tr>
<td>HOURS OF OPERATION FOR A TYPICAL WEEK</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LESS THAN 10</td>
<td>185</td>
<td>0.069</td>
</tr>
<tr>
<td>10 OR FEWER HOURS</td>
<td>566</td>
<td>0.310</td>
</tr>
<tr>
<td>20 TO 49 HOURS</td>
<td>908</td>
<td>1.014</td>
</tr>
<tr>
<td>50 TO 99 HOURS</td>
<td>896</td>
<td>1.231</td>
</tr>
<tr>
<td>61 TO 84 HOURS</td>
<td>595</td>
<td>0.920</td>
</tr>
<tr>
<td>MORE THAN 84 HOURS</td>
<td>608</td>
<td>2.008</td>
</tr>
<tr>
<td>WEATHERSTRIPPING OR CAULKING ADDED SINCE 1974</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td>1,435</td>
<td>2.297</td>
</tr>
<tr>
<td>NO</td>
<td>2,649</td>
<td>2.083</td>
</tr>
<tr>
<td>DON'T KNOW/NOT REPORTED</td>
<td>194</td>
<td>0.277</td>
</tr>
</tbody>
</table>

See notes at end of table.
## Table 5. (Continued)

### Total Consumption and Expenditures by Fuel Type

<table>
<thead>
<tr>
<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL CONSUMPTION (QUADRILLION BTU)</th>
<th>TOTAL EXPENDITURES (MILLION DOLLARS)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ALL</td>
<td>NATURAL</td>
</tr>
<tr>
<td>INSULATION ADDED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td>1,077</td>
<td>1,497</td>
</tr>
<tr>
<td>NO</td>
<td>2,006</td>
<td>3.725</td>
</tr>
<tr>
<td>DON'T KNOW/NOT REPORTED</td>
<td>216</td>
<td>0.752</td>
</tr>
</tbody>
</table>

WEATHERSTRIPPING OR CAULKING, AND INSULATION ADDED

| YES                      | 663  | 0.987 | 0.368 | 0.357 | 0.136 | 0.016 | 0.038 | 6.306 | 1.031 | 4.423 | 0.537 | 0.105 |
| NO                       | 2,006 | 4.297 | 1.869 | 1.594 | 0.631 | 0.233 | 0.171 | 28.766 | 3.906 | 19.769 | 2.540 | 1.699 | 1.002 |
| DON'T KNOW/NOT REPORTED  | 216  | 0.752 | 0.117 | 0.104 | 0.024 | 0.074 | 0.166 | 1.975 | 0.364 | 1.388 | 0.172 |

REDUCED HEATING

| YES                      | 2,006 | 4.198 | 1.829 | 1.549 | 0.612 | 0.043 | 0.161 | 28.640 | 4.940 | 19.740 | 2.621 | 2.221 | 1.036 |
| NO                       | 567   | 1.660 | 0.459 | 0.379 | 0.156 | 0.038 | 0.052 | 6.552 | 1.024 | 4.670 | 0.164 | 0.216 |
| NOT REPORTED/             | 358   | 0.121 | 0.066 | 0.127 | 0.022 | 0.011 | 0.019 | 1.815 | 0.101 | 1.608 | 0.094 |

REDUCED COOLING

| YES                      | 1,482 | 2.075 | 1.216 | 1.080 | 0.338 | 0.023 | 0.150 | 20.587 | 5.273 | 15.452 | 1.365 | 1.16 |
| NO                       | 525   | 0.724 | 0.317 | 0.332 | 0.077 | 0.014 | 0.059 | 5.439 | 0.920 | 4.014 | 0.249 |
| NOT REPORTED/             | 2,171 | 1.743 | 0.622 | 0.465 | 0.376 | 0.024 | 0.053 | 16.465 | 2.652 | 6.125 | 1.695 |

REDUCED HEATING OR REDUCED COOLING

| YES                      | 3,074 | 4.652 | 1.949 | 1.641 | 0.649 | 0.044 | 0.170 | 30.127 | 5.174 | 20.880 | 2.650 | 2.241 | 1.009 |
| NO                       | 473   | 0.627 | 0.357 | 0.316 | 0.118 | 0.008 | 0.029 | 5.277 | 0.935 | 3.656 | 0.678 | 0.163 |
| NOT REPORTED/             | 39    | 0.126 | 0.026 | 0.064 | 0.022 | 0.006 | 0.018 | 0.916 | 0.099 | 0.712 | 0.093 | 0.33 |

NOTE: A "-" = NOT APPLICABLE. G = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. DATA MAY NOT SUM TO TOTALS DUE TO ROUNDING ON MULTIPLE ENERGY SOURCES. SEE GLOSSARY FOR DEFINITIONS OF TERMS USED IN THIS TABLE. SEE APPENDIX 3 FOR DISCUSSION OF LIMITATIONS OF DATA.

SOURCE: RESIDENTIAL AND COMMERCIAL BRANCH, ENERGY END USE DIVISION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY INFORMATION ADMINISTRATION, THE 1979 NONRESIDENTIAL BUILDINGS ENERGY CONSUMPTION SURVEY.
## Table 6. Fuel Oil and Kerosene Consumption and Expenditures for Commercial Buildings That Use Fuel Oil or Kerosene or Both, 1979

<table>
<thead>
<tr>
<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL BUILDINGS (THOUSANDS)</th>
<th>AVERAGE SQUARE FEET</th>
<th>TOTAL CONSUMED (BILLION BTU)</th>
<th>AVERAGE AMOUNT CONSUMED (BILLION BTU)</th>
<th>TOTAL EMPLOYEES</th>
<th>AVERAGE AMOUNT EXPEND. PER MILLION BTU</th>
<th>TOTAL EXPEND. (DOLLARS)</th>
<th>AVERAGE EXPEND. PER MILLION BTU</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COMMERCIAL BUILDINGS</strong></td>
<td>615</td>
<td>13,317</td>
<td>16.3</td>
<td>0.791</td>
<td>5,614</td>
<td>49</td>
<td>510</td>
<td>4.01</td>
</tr>
</tbody>
</table>

### End Use by Fuel Type

#### Heating Fuel Used

| NATURAL GAS | 117 | 4.614 | 35.3 | .106 | 1,177 | 13,749 | 36 | 26 | 692 | 5.4 | 3.92 |
| ELECTRICITY | 95  | 2.042 | 21.6 | .071 | 500  | 7,452  | 35 | 21 | 299 | 3.2 | 4.26 |
| FUEL OIL/KEROSENE | 762 | 16.784 | 14.1 | .762 | 4,975 | 9,236  | 65 | 52 | 2,040 | 3.6 | 4.10 |

#### No Heating Fuel Used

| NATURAL GAS | 55  | 1.061 | 9.0  | .257 | 356  | 5,475  | 68 | 40 | 1,200 | 5.6 | 2.95 |
| ELECTRICITY | 39  | 0.918 | 8.3  | .213 | 409  | 6,361  | 70 | 48 | 1,048 | 4.7 | 2.46 |

### Water-Heating Fuel Used

| NATURAL GAS | 123 | 4.604 | 30.9 | .213 | 1,016 | 17,293 | 44 | 26 | 817  | 6.7 | 3.67 |
| ELECTRICITY | 301 | 3.940 | 13.3 | .259 | 1,850 | 8,612  | 65 | 55 | 1,927 | 3.6 | 3.33 |
| FUEL OIL/KEROSENE | 160 | 4.526 | 26.0 | .335 | 2,226 | 16,627 | 69 | 50 | 1,227 | 2.0 | 1.99 |

#### No Water-Heating Fuel

| NATURAL GAS | 237 | 1.569 | 6.6  | .110 | 769  | 4,662  | 70 | 50 | 470  | 2.0 | 4.26 |

### Manufacturing Fuel Used

| ELECTRICITY | 63  | 1.559 | 24.3 | .104 | 988  | 22,881 | 91 | 73 | 557  | 8.6 | 3.96 |
| OTHER        | 29  | 1.352 | 37.9 | .136 | 959  | 47,543 | 126 | 80 | 513  | 3.9 | 3.63 |

#### No Manufacturing Done

| NATURAL GAS | 736 | 11,298 | 15.4 | .599 | 4,256 | 8,124  | 53 | 37 | 2,480 | 3.6 | 4.15 |

### Cooking Fuel Used

| ELECTRICITY | 179 | 4.173 | 23.3 | .171 | 1,219 | 9,581  | 41 | 26 | 711  | 4.0 | 4.16 |
| OTHER        | 51  | 683  | 13.4 | .050 | 211  | 5,763  | 43 | 22 | 179  | 2.5 | 3.60 |

#### No Cooking Fuel

| NATURAL GAS | 486 | 5,155 | 10.6 | .412 | 2,950 | 6,505  | 80 | 61 | 1,720 | 3.5 | 4.19 |

### Census Region

| NORTHWEST | 307 | 5,561 | 16.1 | .364 | 2,576 | 11,654 | 65 | 53 | 1,466 | 4.0 | 3.90 |
| NORTH CENTRAL | 107 | 3,132 | 16.7 | .141 | 1,006 | 7,556  | 45 | 36 | 601  | 3.2 | 4.27 |
| SOUTH       | 251 | 3,160 | 17.7 | .157 | 1,923 | 10,260 | 81 | 49 | 1,915 | 4.0 | 3.85 |
| WEST        | 69  | 1,437 | 21.9 | .129 | 211  | 4,468  | 50 | 35 | 1,128 | 2.0 | 4.68 |

See notes at end of table.
## Table 6. (Continued)

<table>
<thead>
<tr>
<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL BUILDINGS</th>
<th>TOTAL SQUARE FEET (THOUSANDS)</th>
<th>AVERAGE SQUARE FEET</th>
<th>TOTAL AMOUNT CONSUMED (THOUSANDS)</th>
<th>AVERAGE AMOUNT CONSUMED PER MILLION BTU</th>
<th>AVERAGE AMOUNT CONSUMED PER MILLION BUILDING SQ FT</th>
<th>AVERAGE AMOUNT CONSUMED PER MILLION GALLONS</th>
<th>AVERAGE AMOUNT CONSUMED PER MILLION BTU</th>
<th>TOTAL EXPEND. EXPEND.</th>
<th>AVERAGE EXPEND.</th>
<th>AVERAGE EXPEND.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SSE/NSSE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSE</td>
<td>418</td>
<td>9,219</td>
<td>22.2</td>
<td>0.510</td>
<td>3,740</td>
<td>12,669</td>
<td>57</td>
<td>37</td>
<td>2,125</td>
<td>5.1</td>
<td>4.61</td>
</tr>
<tr>
<td>NSSE</td>
<td>396</td>
<td>4,096</td>
<td>10.3</td>
<td>0.461</td>
<td>1,887</td>
<td>6,592</td>
<td>64</td>
<td>59</td>
<td>1,124</td>
<td>2.8</td>
<td>4.26</td>
</tr>
<tr>
<td><strong>HEATING AND COOLING</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Degree-Days</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;2,000 CDD AND &gt;7,000 HDD</td>
<td>140</td>
<td>1,083</td>
<td>13.4</td>
<td>0.076</td>
<td>547</td>
<td>5,658</td>
<td>41</td>
<td>40</td>
<td>327</td>
<td>4.3</td>
<td>4.18</td>
</tr>
<tr>
<td>&gt;2,000 CDD AND 5,500 TO 7,000 HDD</td>
<td>244</td>
<td>4,106</td>
<td>57.5</td>
<td>0.242</td>
<td>1,272</td>
<td>9,599</td>
<td>57</td>
<td>41</td>
<td>1,036</td>
<td>4.2</td>
<td>4.19</td>
</tr>
<tr>
<td>&lt;2,000 CDD AND 4,000 TO 5,499 HDD</td>
<td>360</td>
<td>4,735</td>
<td>55.7</td>
<td>0.292</td>
<td>2,067</td>
<td>9,548</td>
<td>61</td>
<td>45</td>
<td>1,211</td>
<td>4.0</td>
<td>4.15</td>
</tr>
<tr>
<td>&lt;2,000 CDD AND &lt;4,000 HDD</td>
<td>64</td>
<td>1,496</td>
<td>20.5</td>
<td>0.129</td>
<td>648</td>
<td>4,675</td>
<td>33</td>
<td>33</td>
<td>483</td>
<td>4.0</td>
<td>3.67</td>
</tr>
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<td>97</td>
<td>9</td>
<td>9</td>
<td>53</td>
<td>1.0</td>
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**Total Square Footage**

| 1,000 OR LESS | 64 | 50 | 7.7 | 0.016 | 117 | 1,911 | 291 | 61 | 73 | 4.99 |
| 1,001 TO 5,000 | 319 | 571 | 2.7 | 0.112 | 604 | 5,588 | 129 | 75 | 500 | 1.6 | 4.54 |
| 5,001 TO 10,000 | 181 | 1,029 | 7.4 | 0.075 | 656 | 5,588 | 71 | 62 | 412 | 2.3 | 4.56 |
| 10,001 TO 25,000 | 130 | 2,017 | 15.7 | 0.141 | 1,064 | 10,650 | 69 | 61 | 596 | 4.6 | 4.21 |
| 25,001 TO 50,000 | 53 | 1,056 | 35.3 | 0.131 | 807 | 21,066 | 61 | 79 | 469 | 5.9 | 4.14 |
| OVER 50,000 | 48 | 7,190 | 100.9 | 0.317 | 2,039 | 40,746 | 44 | 67 | 1,182 | 24.8 | 3.73 |

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*Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures*

Steam, Fuel Oil, LPG, and All Fuels

Energy Information Administration
### Consumption and Expenditures for Buildings Using Fuel Oil or Kerosene

Table 6. (Continued)

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<tr>
<th>Building Characteristics</th>
<th>TOTAL BUILDINGS (THOUSANDS)</th>
<th>TOTAL FEET</th>
<th>AVERAGE FEET PER BUILDING</th>
<th>TOTAL CONSUMED (GALLONS)</th>
<th>AVERAGE CONSUMED (GALLONS)</th>
<th>TOTAL CONSUMED (MILLION BTU)</th>
<th>AVERAGE CONSUMED (MILLION BTU)</th>
<th>TOTAL EXPEND. (MILLION DOLLARS)</th>
<th>AVERAGE EXPEND. PER BUILDING (MILLION DOLLARS)</th>
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**Nonresidential Buildings Energy Consumption Survey:** 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
### Table 6. (Continued)

#### Consumption and Expenditures for Buildings Using Fuel Oil or Kerosene

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### Notes
- **See Notes at End of Table**
- **Nonresidential Buildings Energy Consumption Survey:**
  - 1979 Consumption and Expenditures
  - Steam, Fuel Oil, LPG, and All Fuels
  - Energy Information Administration
## Consumption and Expenditures for Buildings Using Fuel Oil or Kerosene

Table 6. (Continued)

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<th>AVERAGE BUILDING</th>
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SEE NOTES AT END OF TABLE

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures Steam, Fuel Oil, LPG, and All Fuels Energy Information Administration

67
# Table 6. (Continued)

## Consumption and Expenditures for Buildings Using Fuel Oil or Kerosene

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<tr>
<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL BUILDINGS</th>
<th>TOTAL SQUARE FEET</th>
<th>AVERAGE SQUARE FEET</th>
<th>TOTAL CONSUMED</th>
<th>AVERAGE CONSUMED</th>
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**REduced Heating**

| YES........................ | 668            | 10,026            | 15.9                | 0.612          | 4,546           | 9,173        | 58             | 40           | 2,521         | 3.8           | 4.20           |
| NO........................  | 123            | 5,479             | 16.7                | 0.156          | 3,108           | 11,775       | 63             | 46           | 624           | 4.7           | 4.60           |
| NOT REPORTED/              | 14             | 213               | 14.8                | 0.022          | 160             | 106          | 51             | 9           | 106           | 4.19          |                |

**Reduced Cooling**

| YES........................ | 214            | 6,309             | 29.9                | 0.338          | 2,387           | 15,793       | 55             | 28           | 1,348         | 6.3           | 4.58           |
| NO........................  | 36             | 1,445             | 40.2                | 0.077          | 545             | 21,605       | 53             | 32           | 299           | 8.3           | 3.85           |
| NOT REPORTED/              | 565            | 5,463             | 9.7                 | 0.376          | 2,583           | 6,665        | 69             | 51           | 1,592         | 2.8           | 4.14           |

**Reduced Heating or Reduced Cooling**

| YES........................ | 667            | 1824              | 16.4                | 0.494          | 4,093           | 9,445        | 58             | 41           | 2,200         | 3.9           | 4.10           |
| NO........................  | 115            | 1,013             | 15.7                | 0.118          | 640             | 10,214       | 65             | 45           | 470           | 4.2           | 4.00           |
| NOT REPORTED/              | 12             | 133               | 17.2                | 0.024          | 172             | 100          | 9              | 6            | 100           | 4.16          |                |

*NOTE: A "-" = NOT APPLICABLE. Q = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. DATA MAY NOT SUM TO TOTALS DUE TO ROUNDING OR MULTIPLE ENERGY SOURCES. SEE GLOSSARY FOR DEFINITIONS OF TERMS USED IN THIS TABLE. SEE APPENDIX 6 FOR DISCUSSION OF LIMITATIONS OF DATA.*

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<th>TOTAL SQUARE FEET (MILLIONS)</th>
<th>AVERAGE SQUARE FEET PER BUILDING (THOUSANDS)</th>
<th>TOTAL AMOUNT CONSUMED (MILLION BTU)</th>
<th>AVERAGE AMOUNT CONSUMED PER SQUARE FOOT (MILLION BTU)</th>
<th>AVERAGE AMOUNT WITH EMPLOYEE (MILLION BTU)</th>
<th>AVERAGE EXPENDURES (MILLION DOLLARS)</th>
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SEE NOTES AT END OF TABLE
Table 7. (Continued)

### Building Characteristics

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**Nonresidential Buildings Energy Consumption Survey:**

1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
## Consumption and Expenditures for Buildings Using LPG

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SEE NOTES AT END OF TABLE

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
Table 7 (Continued)

Consumption and Expenditures for Buildings Using LPG

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Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
### Table 7. (Continued)

**Building Characteristics**

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<td>0.024</td>
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**Note:** A "-" = Not Applicable. Q = Data withheld because of a large variance. Data may not sum to totals due to recording on multiple energy sources. See Glossary for definitions of terms used in this table. See Appendix B for discussion of limitations of data.

### Commercial Buildings That Use Steam, 1979

**Table 8. Steam Consumption and Expenditures for Commercial Buildings That Use Steam, 1979**

<table>
<thead>
<tr>
<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL BUILDINGS (THOUSANDS)</th>
<th>AVERAGE BUILDING (THOUSANDS)</th>
<th>TOTAL AMOUNT CONSUMED (TRILLION BTU)</th>
<th>AVERAGE AMOUNT CONSUMED PER SQUARE FOOT (BILLION BTU)</th>
<th>AVERAGE AMOUNT CONSUMED PER EMPLOYEE (MILLION BTU)</th>
<th>AVERAGE AMOUNT CONSUMED PER MILLION DOLLARS EXPEND.</th>
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<th>NONSMA</th>
<th>SMA</th>
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**Nonresidential Buildings Energy Consumption Survey:** 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration

SEE NOTES AT END OF TABLE
Table 8. (Continued)

Consumption and Expenditures for Buildings Using Steam

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<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL SQUARE FEET</th>
<th>PER BUILDING (THOUSANDS)</th>
<th>TOTAL AMOUNT CONSUMED (QUADRILLION BTU)</th>
<th>AVERAGE AMOUNT CONSUMED PER MILLION BTU</th>
<th>TOTAL AMOUNT EXPENDED (TRILLION DOLLARS)</th>
<th>AVERAGE AMOUNT EXPENDED PER THOUSAND DOLLARS</th>
<th>TOTAL AMOUNT EMPLOYEES PER BUILDING (THOUSANDS)</th>
<th>AVERAGE AMOUNT EXPENDED PER THOUSAND EMPLOYEES</th>
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SEE NOTES AT END OF TABLE

Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
Table 8. (Continued)

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<thead>
<tr>
<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL BUILDINGS</th>
<th>TOTAL BUILDING FEET (THOUSANDS)</th>
<th>AVERAGE BUILDING SQUARE FEET</th>
<th>TOTAL AMOUNT CONSUMED (TRILLION BTU)</th>
<th>AVERAGE AMOUNT CONSUMED PER BUILDING (TRILLION BTU)</th>
<th>TOTAL BUILDING ENERGY SOURCES (MILLION BTU)</th>
<th>AVERAGE AMOUNT CONSUMED PER EMPLOYEE (BTU)</th>
<th>TOTAL EXPEND. (MILLION DOLLARS)</th>
<th>AVERAGE EXPEND. PER EMPLOYEE (DOLLARS)</th>
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<td>0.049</td>
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<td>0.054</td>
<td>2,385</td>
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<td>PERCENT OF BUILDING HEATED</td>
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<td></td>
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<td></td>
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<td></td>
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</tr>
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<td>1 TO 99</td>
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<td>0.007</td>
<td>Q</td>
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<td>666</td>
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<td>0.033</td>
<td>Q</td>
<td>76</td>
<td>Q</td>
<td>249</td>
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<td></td>
<td></td>
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<tr>
<td>WINDOW UNITS</td>
<td>8</td>
<td>346</td>
<td>Q</td>
<td>0.017</td>
<td>0.017</td>
<td>Q</td>
<td>59</td>
<td>Q</td>
<td>189</td>
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<tr>
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<td>555</td>
<td>63.2</td>
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<td>0.029</td>
<td>3,360</td>
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<td>159</td>
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<tr>
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<td>1,503</td>
<td>125.6</td>
<td>0.070</td>
<td>0.070</td>
<td>6,511</td>
<td>52</td>
<td>19</td>
<td>482</td>
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<tr>
<td>COMBINATION/OTHER</td>
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<td>980</td>
<td>133.5</td>
<td>0.047</td>
<td>0.047</td>
<td>6,352</td>
<td>48</td>
<td>20</td>
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<tr>
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<td>446</td>
<td>36.0</td>
<td>0.033</td>
<td>0.033</td>
<td>Q</td>
<td>74</td>
<td>Q</td>
<td>240</td>
</tr>
<tr>
<td>OCCUPANCY CHARACTERISTICS</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SINGLE ESTABLISHMENT</td>
<td>23</td>
<td>1,445</td>
<td>62.7</td>
<td>0.067</td>
<td>0.067</td>
<td>2,090</td>
<td>46</td>
<td>47</td>
<td>379</td>
</tr>
<tr>
<td>MULTIPLE ESTABLISHMENT</td>
<td>7</td>
<td>1,036</td>
<td>140.6</td>
<td>0.049</td>
<td>0.049</td>
<td>6,610</td>
<td>47</td>
<td>17</td>
<td>333</td>
</tr>
<tr>
<td>GOVERNMENT-OWNED AND</td>
<td>10</td>
<td>1,325</td>
<td>Q</td>
<td>0.089</td>
<td>0.089</td>
<td>Q</td>
<td>67</td>
<td>27</td>
<td>573</td>
</tr>
<tr>
<td>OCCUPIED</td>
<td>1</td>
<td>250</td>
<td>300.8</td>
<td>0.006</td>
<td>0.006</td>
<td>7,004</td>
<td>24</td>
<td>56</td>
<td>452</td>
</tr>
</tbody>
</table>

SEE NOTES AT END OF TABLE

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
## Consumption and Expenditures for Buildings Using Steam

### Table 8. (Continued)

<table>
<thead>
<tr>
<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL SQUARE FEET</th>
<th>AVERAGE SQUARE FEET</th>
<th>TOTAL AMOUNT CONSUMED (MILLION BTU)</th>
<th>AVERAGE AMOUNT CONSUMED (THOUSANDS BTU)</th>
<th>TOTAL AMOUNT CONSUMED (POUNDS)</th>
<th>AVERAGE AMOUNT CONSUMED (THOUSANDS)</th>
<th>TOTAL AMOUNT EXPENDED (MILLION DOLLARS)</th>
<th>AVERAGE AMOUNT EXPENDED (THOUSANDS)</th>
<th>TOTAL AMOUNT EXPENDED (DOL- LARS)</th>
<th>AVERAGE AMOUNT EXPENDED (DOL- LARS)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LIONS!</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### NUMBER OF PEOPLE WORKING IN THE BUILDING

|                |                  |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |
|----------------|------------------|--------------------|--------------------------------------|------------------------------------------|-------------------------------|--------------------------------------|----------------------------------------|                                     |                                   |                                     |
| LESS THAN 20  |                  |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |
| 20 TO 99      |                  |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |
| 100 OR MORE   |                  |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |

### HOURS OF OPERATION FOR A TYPICAL WEEK

|                  |                  |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |
|------------------|------------------|--------------------|--------------------------------------|------------------------------------------|-------------------------------|--------------------------------------|----------------------------------------|                                     |                                   |                                     |
| LESS THAN 40     |                  |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |
| 40 TO 48 HOURS  |                  |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |
| 49 TO 64 HOURS  |                  |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |

### WEATHERSTRIPPING OR CAULKING ADED SINCE 1974

|                  |                  |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |
|------------------|------------------|--------------------|--------------------------------------|------------------------------------------|-------------------------------|--------------------------------------|----------------------------------------|                                     |                                   |                                     |
| YES              |                  |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |
| NO               |                  |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |
| DON'T KNOW/NOT REPORTED |        |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |

### INSULATION ADED

|                  |                  |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |
|------------------|------------------|--------------------|--------------------------------------|------------------------------------------|-------------------------------|--------------------------------------|----------------------------------------|                                     |                                   |                                     |
| YES              |                  |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |
| NO               |                  |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |
| DON'T KNOW/NOT REPORTED |        |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |

### REDUCED HEATING

|                  |                  |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |
|------------------|------------------|--------------------|--------------------------------------|------------------------------------------|-------------------------------|--------------------------------------|----------------------------------------|                                     |                                   |                                     |
| YES              |                  |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |
| NO               |                  |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |
| NOT REPORTED/NOT APPLICABLE |    |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |

### REDUCED COOLING

|                  |                  |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |
|------------------|------------------|--------------------|--------------------------------------|------------------------------------------|-------------------------------|--------------------------------------|----------------------------------------|                                     |                                   |                                     |
| YES              |                  |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |
| NO               |                  |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |
| NOT REPORTED/NOT APPLICABLE |    |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |

### REDUCED HEATING OR REDUCED COOLING

|                  |                  |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |
|------------------|------------------|--------------------|--------------------------------------|------------------------------------------|-------------------------------|--------------------------------------|----------------------------------------|                                     |                                   |                                     |
| YES              |                  |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |
| NO               |                  |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |
| NOT REPORTED/NOT APPLICABLE |    |                    |                                      |                                          |                               |                                      |                                        |                                     |                                   |                                     |

### Note:
- A "-" = NOT APPLICABLE, Q = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. DATA MAY NOT SUM TO TOTALS DUE TO ROUNDING OR MULTIPLE ENERGY SOURCES. SEE GLOSSARY FOR DEFINITIONS OF TERMS USED IN THIS TABLE. SEE APPENDIX B FOR DISCUSSION OF LIMITATIONS OF DATA.
Table 9. Distribution of Commercial Buildings Supplied with Fuel Oil, by Number of Tanks, Tank Capacity, and Inventory, as of January 1, 1980 (Thousands of Buildings)

<table>
<thead>
<tr>
<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL BUILDINGS [THOUSANDS]</th>
<th>NO TANK</th>
<th>LESS THAN 500</th>
<th>500 TO 1,999</th>
<th>2,000 TO 4,999</th>
<th>5,000 TO 9,999</th>
<th>10,000 AND OVER</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMMERCIAL BUILDINGS.....</td>
<td>815</td>
<td>10</td>
<td>305</td>
<td>333</td>
<td>46</td>
<td>56</td>
<td>63</td>
</tr>
<tr>
<td>NUMBER OF FUEL OIL TANKS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NONE.....................</td>
<td>10</td>
<td>10</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ONE.....................</td>
<td>657</td>
<td>-</td>
<td>287</td>
<td>247</td>
<td>36</td>
<td>51</td>
<td>37</td>
</tr>
<tr>
<td>TWO OR MORE.............</td>
<td>147</td>
<td>-</td>
<td>16</td>
<td>67</td>
<td>11</td>
<td>Q</td>
<td>26</td>
</tr>
<tr>
<td>INVENTORY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NONE.....................</td>
<td>46</td>
<td>10</td>
<td>27</td>
<td>6</td>
<td>Q</td>
<td>Q</td>
<td>Q</td>
</tr>
<tr>
<td>LESS THAN 500...........</td>
<td>410</td>
<td>-</td>
<td>277</td>
<td>132</td>
<td>21</td>
<td>Q</td>
<td>Q</td>
</tr>
<tr>
<td>500 TO 1,999............</td>
<td>222</td>
<td>-</td>
<td>-</td>
<td>194</td>
<td>21</td>
<td>Q</td>
<td>Q</td>
</tr>
<tr>
<td>2,000 TO 4,999..........</td>
<td>54</td>
<td>-</td>
<td>-</td>
<td>25</td>
<td>20</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>5,000 TO 9,999..........</td>
<td>43</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>23</td>
<td>21</td>
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<tr>
<td>10,000 AND OVER.........</td>
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<td>-</td>
<td>-</td>
<td>36</td>
</tr>
</tbody>
</table>

NOTE: A "-" = NOT APPLICABLE. Q = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. DATA MAY NOT SUM TO TOTALS DUE TO ROUNDING OR MULTIPLE ENERGY SOURCES. SEE GLOSSARY FOR DEFINITIONS OF TERMS USED IN THIS TABLE. SEE APPENDIX B FOR DISCUSSION OF LIMITATIONS OF DATA.

SOURCE: RESIDENTIAL AND COMMERCIAL BRANCH, ENERGY END USE DIVISION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY INFORMATION ADMINISTRATION, THE 1979 NONRESIDENTIAL BUILDINGS ENERGY CONSUMPTION SURVEY.
Table 10. 1979 Total Fuel Oil Tank Capacity and Inventory by Number of Tanks, as of January 1, 1980 (Million Gallons)

<table>
<thead>
<tr>
<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL BUILDINGS</th>
<th>TOTAL NUMBER OF FUEL OIL TANKS</th>
<th>ONE TANK</th>
<th>TWO OR MORE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ALL BUILDINGS WITH FUEL OIL TANKS (THOUSANDS)</td>
<td>TOTAL TANK CAPACITY</td>
<td>TOTAL INVENTORY</td>
<td>TOTAL TANK CAPACITY</td>
</tr>
<tr>
<td></td>
<td>ALL BUILDINGS WITH FUEL OIL TANKS (THOUSANDS)</td>
<td>TOTAL TANK CAPACITY</td>
<td>TOTAL INVENTORY</td>
<td>TOTAL TANK CAPACITY</td>
</tr>
<tr>
<td>COMMERCIAL BUILDINGS.....</td>
<td>504</td>
<td>1.066</td>
<td>3,137</td>
<td>2,155</td>
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<tr>
<td>TOTAL TANK CAPACITY IN GALLONS</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>LESS THAN 500.............</td>
<td>305</td>
<td>325</td>
<td>72</td>
<td>50</td>
</tr>
<tr>
<td>500 TO 1,999..............</td>
<td>333</td>
<td>442</td>
<td>248</td>
<td>185</td>
</tr>
<tr>
<td>2,000 TO 4,999............</td>
<td>44</td>
<td>47</td>
<td>131</td>
<td>88</td>
</tr>
<tr>
<td>5,000 TO 9,999............</td>
<td>16</td>
<td>62</td>
<td>336</td>
<td>236</td>
</tr>
<tr>
<td>10,000 AND OVER...........</td>
<td>63</td>
<td>110</td>
<td>2,452</td>
<td>1,694</td>
</tr>
<tr>
<td>INVENTORY</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>NONE .....................</td>
<td>36</td>
<td>45</td>
<td>17</td>
<td>-</td>
</tr>
<tr>
<td>LESS THAN 500.............</td>
<td>410</td>
<td>474</td>
<td>147</td>
<td>94</td>
</tr>
<tr>
<td>500 TO 1,999..............</td>
<td>222</td>
<td>293</td>
<td>270</td>
<td>176</td>
</tr>
<tr>
<td>2,000 TO 4,999............</td>
<td>54</td>
<td>61</td>
<td>324</td>
<td>155</td>
</tr>
<tr>
<td>5,000 TO 9,999............</td>
<td>43</td>
<td>50</td>
<td>399</td>
<td>299</td>
</tr>
<tr>
<td>10,000 AND OVER...........</td>
<td>30</td>
<td>83</td>
<td>2,080</td>
<td>1,529</td>
</tr>
</tbody>
</table>

NOTE: A "-" = NOT APPLICABLE. Q = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. DATA MAY NOT SUM TO TOTALS DUE TO ROUNGING OR MULTIPLE ENERGY SOURCES. SEE GLOSSARY FOR DEFINITIONS OF TERMS USED IN THIS TABLE. SEE APPENDIX 8 FOR DISCUSSION OF LIMITATIONS OF DATA.

SOURCE: RESIDENTIAL AND COMMERCIAL BRANCH, ENERGY END USE DIVISION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY INFORMATION ADMINISTRATION, THE 1979 NONRESIDENTIAL BUILDINGS ENERGY CONSUMPTION SURVEY.
Appendix A

How the Survey Was Conducted
Appendix A

Introduction

The Nonresidential Buildings Energy Consumption Survey was designed by the Energy Information Administration (EIA) to provide information related to energy consumption in nonresidential buildings, primarily those in the commercial sector. This survey, along with analogous studies for the residential and industrial sectors, will enable analysts to study comprehensive consumption patterns for the United States.

Information on energy use in the commercial sector was collected at the building level. A representative sample of buildings was selected in the 48 contiguous States plus the District of Columbia. Personal interviews were conducted with building representatives to obtain information on building characteristics and on the types and uses of energy found in the buildings. At the conclusion of the interviews, respondents were asked to sign waivers releasing energy consumption and expenditures data for the buildings. The data on actual energy consumption were collected from fuel records maintained by the buildings' fuel suppliers.

Sample Design

The building sample was a multistage, representative area probability sample consisting of 79 primary sampling units (PSU's). The approximately 3,100 counties and independent cities of the contiguous United States were grouped into about 1,900 PSU's by the Census Bureau for its Current Population Survey. These PSU's, with some modifications, were used to construct the first-stage area-sampling frame. The 25 PSU's that had a 1970 population of more than 1.85 million were designated as self-representing; that is, they were chosen with certainty. The remaining non-self-representing PSU's were placed in strata on the basis of metropolitan status, region, rate of growth from 1960 to 1970, percentage of black population, and a measure of socioeconomic status. They were selected with probabilities proportionate to their 1970 population.

The sample PSU's were then divided into secondary sampling units corresponding to zip codes or groups of zip codes. Procedures were designed to handle zip codes that overlapped county boundaries and/or special zip codes that were assigned to large commercial establishments or Government agencies.

Each zip code was assigned a measure of size based jointly on summary data from the 1975 County Business Patterns (CBP) and on proprietary commercial data related to office machines. The CBP data were weighted counts of establishments by 2-digit Standard Industrial Classification (SIC) code and employment size according to zip code. The measure of size assigned to a zip code was an integer equal to the number of segments into which a zip code would be divided if drawn into the sample. The sizes were assigned in such a way that segments would contain an average of 120 establishments based on the CBP tabulations. After assignments of the measures of size were made, a sample of about five zip code groups was selected in each PSU with probabilities proportionate to the number of segments in each zip code group, giving a total second-stage sample of about 400 zip code groups.

The sample of third-stage units consisted of approximately 400 segments, one selected from each of the sampled zip code areas. The selection of the segments was done in such a way that 1 percent of all segments in the contiguous United States was included in the sample, each having an
equal chance of being selected. In zip code groups with measures of size of six or more, the segments were compact areas. It was feasible to define area segments within these selected zip code groups on the basis of preliminary field work done in the selected zip code areas. In the zip code groups with smaller measures of size, the segments were, in effect, selected from listings made for the complete zip code group.

Nonresidential buildings (excluding farm buildings) were selected from the area segments at the fourth stage of sampling (see Glossary for a definition of "Nonresidential Building"). With a few exceptions, a nonresidential building was defined as a structure that was totally enclosed by walls that extend from the foundation to the roof line and housed some type of nonresidential activity. The first step in the selection process was to do a field canvass to identify and list the addresses of all in-scope buildings within each sampled segment. As part of the listing procedure, the lister made rough estimates based on observations of descriptive information related to energy usage, including square footage and general use. This information was used to categorize buildings for subsampling. About 75,000 buildings were listed (this includes the extra listings in zip code groups with measures of less than six) from which approximately 5,800 buildings were selected for a personal interview. Subsampling fractions from the 1 percent sample of segments varied from 1 in 1 for buildings having measures of size of 50,000 or more square feet as assigned by the lister, to 1 in 20 for small buildings (less than 10,000 square feet) of certain types.

Another part of the sampling procedure entailed preparing in advance a list of "large" buildings within the sampled PSU's and placing them on a Special Building List. "Large" buildings were defined as those with 250,000 or more square feet of enclosed floorspace in PSU's that are Standard Metropolitan Statistical Areas (SMSA). In the remaining one-third of the PSU's, buildings of 100,000 square feet or more were listed. The list of large buildings was compiled from existing lists of schools, hospitals, and Government-owned buildings and also through inquiries with chambers of commerce and other local sources. Some of the large buildings listed were clusters of buildings such as a university campus. About 3,200 buildings (or building clusters) were included on the Special Building List, and approximately 1,200 of these were included in the sample with varying probabilities depending on their sizes. In those cases in which the selected unit consisted of a cluster of buildings, the individual buildings were listed and subsampled at rates designed to yield the desired overall selection probabilities. Large buildings sampled from the area sample list were checked against the Special Building List to identify duplicates and assign them appropriate selection probabilities.

A total of 549 sampled buildings were ineligible for interview. Buildings were designated as being ineligible for interview for a number of reasons, including duplication, incorrect or multiple listings, sample structure failed to meet the building definition, and the sampled structure was demolished after the list was prepared. Duplication resulted from duplicate sample selections from the area sample and the sample selections from the list of large buildings.

Buildings were listed incorrectly or as multiple listings for several reasons. First, the area-sampling technique required that most buildings be listed by observation. Therefore, it was not always possible to determine the exact scope of a building until the interviewing phase, when contact was made with a building owner/manager. Second, since the list of large buildings was obtained through telephone contacts.
what was reported over the telephone to be one building frequently turned out to be a group of buildings. Buildings that did not meet the study definition (e.g., totally residential buildings) were also considered out-of-scope.

Weights were calculated for each sample building to reflect the reciprocals of the probabilities of selection and adjust for differences in the interview completion rate for different classes of buildings. The overall response rate in the survey was 92 percent.

The sample consisted of a total of 7,322 buildings. Of these, 6,773 were eligible to be interviewed; 5,677 were from the area sample, and 1,096 were from the list sample. Westat, Inc., of Rockville, Maryland, conducted the interviews. Extensive follow-up efforts were used in field data collection, and as a result, interviews were initially completed for 91 percent of the eligible buildings. Of those interviewed, 88 percent signed waivers authorizing utility companies to release their buildings' consumption records (see Table A1).

Since the field response was so high, only limited additional follow-up procedures were initiated. In January 1980, an overall refusal-conversion effort was undertaken. An attempt was made to conduct telephone interviews with building owners or managers who had originally refused to be interviewed in person. Calls were made to 197 buildings, and of these, 83 interviews were completed. As a result of this effort, 42 percent of the refusals were converted, and the overall response rate was raised by 1 percentage point, to 92 percent.

<table>
<thead>
<tr>
<th>Building Disposition</th>
<th>Number</th>
<th>Percentage of All Buildings</th>
<th>Percentage of Eligible Buildings</th>
<th>Percentage of Interviewed Buildings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Buildings ......</td>
<td>7,322</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Eligible for Interview ..........</td>
<td>549</td>
<td>7.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eligible for Interview ..........</td>
<td>6,773</td>
<td>92.5</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Interviewed ..........</td>
<td>6,222</td>
<td>--</td>
<td>91.8</td>
<td>100.0</td>
</tr>
<tr>
<td>With Waiver ..........</td>
<td>5,536</td>
<td>--</td>
<td>--</td>
<td>89.0</td>
</tr>
<tr>
<td>Without Waiver .......</td>
<td>686</td>
<td>--</td>
<td>--</td>
<td>11.0</td>
</tr>
<tr>
<td>Not Interviewed .......</td>
<td>551</td>
<td>--</td>
<td>8.2</td>
<td></td>
</tr>
</tbody>
</table>

"--" Indicates data not applicable.

During December 1979, 734 letters were sent to respondents who had completed the interview but did not sign an authorization form. These letters asked them to reconsider their decision. From the waiver-conversion effort, an additional 108 signed waivers were received, 6 refused were received, and 620 failed to reply. This effort resulted in an overall conversion rate of 17 percent and increased the waiver response rate by 1 percentage point, to 89 percent.

In addition to these supplemental follow-up efforts, some additional follow-up was done for a few selected data items that were missing or inconsistent in completed questionnaires. Certain items in the building questionnaire, such as size, building activity, and the names and addresses of fuel suppliers, were designated as being crucial. If any of the crucial items were missing, a telephone call was made to the respondent to try to obtain this information as well as any other missing data.

Initial contacts with the building owners and managers were made through a letter signed by the EIA Administrator. The letter introduced the data collection contractor, stressed the importance of cooperation, and assured the confidentiality of responses.

The building interviews were conducted between October 1979 and January 1980. Respondents were asked about the building as a whole, rather than individual establishments located within the building. Professionals in the areas of architecture, building operations, engineering, statistics, and survey research were consulted during the development of the interview questionnaire. The interviews averaged 50 minutes each and covered structural and operational building features; types of heating, cooling, and ventilation systems; fuel used in these systems and patterns of usage; and a description of the activities found in the building. At the conclusion of the interview, respondents were asked to sign waivers authorizing Westat, Inc., the data collection contractor, to obtain fuel consumption records from the buildings' fuel suppliers.

Nearly 90 percent of the respondents signed waivers to permit fuel suppliers to give Westat, Inc., monthly records of their fuel purchases for the past 14 months. Information was requested on the amount sold, the price of the fuel, the unit of measure, the number of customers, and the billing dates. The suppliers of electricity and natural gas were contacted by mail beginning in August 1979. Two letters were sent to each company. The first, signed by the EIA Administrator, explained the legal authority and need for the data collection. The second letter introduced Westat, Inc., and discussed the data collection procedures and the kind of information that would be requested. Follow-up telephone calls were initiated in September 1979 to ensure the receipt of the letters and to establish a personal contact with the appropriate utility company representative.

After the building interviews were completed and the signed waivers were received, approximately 230 electric and natural gas companies and about 1,300 fuel oil and other energy suppliers were identified for participation.

At the end of February 1980, each supplier was sent a packet containing instructions and explanations, signed waivers, and data-retrieval forms. Follow-up telephone calls were made to the suppliers of electricity and natural gas in March 1980 to make sure the utility companies received the forms, to answer any of their questions, and to obtain an estimated completion date. A letter was then sent to confirm the completion date. If the data were not received within a week of the completion date, a second telephone call was made to deal with any problems that might have arisen and to arrange a second date. Suppliers were not required to
transcribe data to the survey forms. Any format (such as computer print-out) providing the required information was acceptable. A telephone followup of energy suppliers other than electricity and natural gas was implemented in August 1980. Most of the suppliers of LPG, fuel oil, and coal had only one customer in the survey. Therefore, it was considered feasible to obtain the required information over the telephone. During this operation, calls were placed to 429 suppliers, almost 300 of which supplied the requested data.

For the Utility Survey, 13,386 questionnaires were mailed to the 1,509 companies, organizations, and agencies that supplied varying types of energy to the 6,222 buildings participating in the Building Survey. Of the questionnaires mailed, 534 were determined to be ineligible for the Utility Survey. Of the 12,852 eligible cases, there were 11,210 questionnaires with data, for an overall response rate of 87 percent.

Some buildings had many tenants who were metered and billed separately. Interviewers were instructed to obtain lists of tenants in buildings where establishments were separately metered. If there were three or fewer establishments within a building, the interviewer attempted to get a signed waiver for each establishment. In buildings with four or more establishments, the building owner or manager was asked to sign a waiver releasing the aggregate utility records for the occupants of the building.

Companies were asked to supply limited consumption data for those buildings where an interview was completed but a signed waiver was not obtained. Suppliers were requested to aggregate cost and consumption information for a group of buildings and to report a yearly total. While energy suppliers will not provide individual building data without a waiver, some will provide aggregate data for groups of nonrespondent buildings. This information will be used to analyze the potential bias introduced by nonresponse and to improve the accuracy of consumption estimates in the commercial sector.

Field Procedures

Once the sampled zip code groups and segments had been selected, the initial field step was to prepare a listing of building addresses located within the sampled segments (see "Sample Design"). The sample consisted of approximately 400 segments, which were listed by a team of 85 listers. Supervisors attended a 3-day training session during the first week of June 1979. During this session, a combination of slides, exercises, lectures, and an actual listing were used as training devices. Supervisors were also given an annotated manual that described the session. This manual was used as a guidebook to supervisors in order to conduct identical training sessions for the listers.

Before their training, each lister received a copy of a Listing Manual and a home study package with assignments to be turned in before training began. The supervisors trained 85 listers in 2-day sessions conducted in nine cities. As soon as possible after the listing procedure began, the supervisors relisted at least one segment for each lister. This verification provided immediate feedback for the lister and corrected any misunderstandings. The check also served to identify any definitional problems or procedural weaknesses.
Once all the segments had been listed, the field supervisors relisted a subsample of 53, not including the segments that had already been checked. The relisting showed that less than 1 percent of the buildings had been missed. Buildings were usually missed because of questions concerning segment boundaries.

Training for the interview phase began with a 3-day session for supervisors and their assistants in September 1979. Approximately 175 interviewers were trained in 3-day sessions held during October and November 1979. Using a variety of techniques, Westat, Inc., conducted the training of both the supervisors and the interviewers. The training materials included an annotated manual, interactive lectures, role-playing exercises, audiovisual presentations of the interview techniques, and slides relating specific building types to the questionnaire. The supervisors and their assistants functioned as small-group leaders during the interview training.

The completed questionnaires were initially screened by the field supervisors. They were reviewed for completeness, correct identifying information, and ambiguities requiring clarification. The supervisors mailed the completed questionnaires to Westat, Inc., where they were subject to a similar check. Also at this time, certain data were categorized, and some of the more complex data items, such as open-ended questions, were put into special processing. Finally, the questionnaires were coded, keypunched, verified, and computerized. A machine edit check was made for reasonable values, proper skip patterns and logical inconsistencies. Additional edit checks were performed on the consumption and expenditures data received from the buildings' energy suppliers. Data retrieval procedures were instituted in cases in which data were incomplete, inconsistent, or unreasonable. In cases in which data retrieval was not possible, cost and expenses data were imputed (see Appendix B, "Limitations of the Data").

Weather Data

Two types of weather data are used in conjunction with the building interview and consumption data. The first type is the long-term average heating degree-days (HDD) and cooling degree-days (CDD) for the National Oceanic and Atmospheric Administration (NOAA) weather division in which the building is located. These data were used in the preparation of this report. They will be used to analyze the effects of weather on trends in basic building structure and equipment.

The second type of data are the HDD and CDD totals for each building by billing period. These totals are calculated by NOAA division centers for appropriate billing period. For example, one building may be billed on the first of the month, while another may be billed on the fifth. Thus, there are different 30-day averages of HDD and CDD for each billing period. These data will allow more complete analysis of fuel consumption. They will be included in the public-use data tape of the consumption file. Analyses of usage patterns and operation characteristics can be undertaken only if the confounding effects of the weather are controlled.

Adjusting for Nonresponse

The amount of data collected from this survey was reduced by two types of nonresponse: unit nonresponse (e.g., noninterview) and nonresponse to particular items in an otherwise completed interview. As mentioned in the section, "Sample Design," unit nonresponse was handled by adjusting the sampling weights of responding buildings. Item nonresponse
for selected building characteristics was treated by imputing data from responding cases, using a separate hot-deck procedure for each item. (For more information on the imputation procedures used for this survey, see Appendix B, "Limitations of the Data.") The only data element for which a hot-deck procedure was not used was square footage. For this variable, the lister's guess was used, unless that guess was less than 10,000 or greater than 100,000 square feet. When the lister's square footage estimate was in either of these categories, an average unweighted square foot per floor was computed for all responding buildings of the same type in the same size class. This value was then multiplied by the number of floors in the building of interest to produce an estimate of square footage for the building. Most of the imputed building characteristics items had less than 2-percent nonresponse; two of them (year constructed and square footage) had about 3-percent nonresponse, and one item (hours of operation) had about 7-percent nonresponse.

Table A2 shows the effect of unit nonresponse adjustment and item imputations on estimates of numbers of buildings by square footage category and year built. The left column of the table contains the estimated numbers using the basic inflation weight without nonresponse adjustment and eliminating those buildings whose value for the stub variable was imputed. In the center column, the nonresponse adjustment has been incorporated into the building weight, but the buildings with imputed values are still eliminated. The entries in the right column match those in the detailed tables because nonresponse adjustments and imputed cases are both included in the estimation procedure.

<table>
<thead>
<tr>
<th>Population Subgroup</th>
<th>Estimated Number of Buildings (Thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Without Nonresponse Adjustment or Imputations</td>
</tr>
<tr>
<td>All Buildings</td>
<td></td>
</tr>
<tr>
<td>(Square Feet)</td>
<td></td>
</tr>
<tr>
<td>Less Than or Equal to 1,000</td>
<td>604</td>
</tr>
<tr>
<td>1,001-5,000</td>
<td>1,510</td>
</tr>
<tr>
<td>5,001-10,000</td>
<td>667</td>
</tr>
<tr>
<td>10,001-25,000</td>
<td>498</td>
</tr>
<tr>
<td>25,001-50,000</td>
<td>217</td>
</tr>
<tr>
<td>Over 50,000</td>
<td>185</td>
</tr>
<tr>
<td>All Buildings</td>
<td>3,638</td>
</tr>
<tr>
<td>(Year Built)</td>
<td></td>
</tr>
<tr>
<td>1900 or Before</td>
<td>281</td>
</tr>
<tr>
<td>1901-1920</td>
<td>375</td>
</tr>
<tr>
<td>1921-1945</td>
<td>716</td>
</tr>
<tr>
<td>1946-1960</td>
<td>912</td>
</tr>
<tr>
<td>1961-1970</td>
<td>663</td>
</tr>
<tr>
<td>1971-1973</td>
<td>206</td>
</tr>
<tr>
<td>1974-Present</td>
<td>487</td>
</tr>
</tbody>
</table>

Appendix B

Limitations of the Data

\[ RSE(X/Y) = \sqrt{RSE^2(X) + RSE^2(Y)} \]
Data from the Nonresidential Buildings Energy Consumption Survey (NBECS) are subject to many sources of sampling error, nonsampling error, and bias. Sampling error is a measure of variability in the data because a subset of buildings was surveyed rather than the entire population. Because probability sampling was used for the NBECS, estimates of sampling error could be computed for survey statistics. These estimates were computed using a balanced half-sample replication procedure described later in this section of the report. Nonsampling error and bias are measures of variability and lack of accuracy in survey data due to the conduct of the survey. Components of these error measures include coverage bias, respondent bias and response variance, interviewer error, coding and/or keypunching error, and nonresponse bias. Survey logistics such as wording and format of the survey questionnaires, the procedures used to select and train interviewers, and the quality control built into the data collection, data receipt, and data processing operations were all designed to minimize these sources of error (for discussion of these procedures, see Appendix A, “How the Survey Was Conducted”). Even so, nonsampling error, especially error due to nonresponse, is of major concern for the statistics shown in this report. Caution should be used in analyzing the data, especially in the use of statistical tests of hypotheses based on sampling errors only. Readers should be conservative in drawing conclusions based on statistical tests of hypotheses. Because of the extent of nonresponse for important data items in this survey, extensive and rather complex procedures were devised to impute for missing data items. The procedures used to adjust for unit nonresponse and impute building characteristics have been described in Reference 1, the companion to this report, and will not be repeated here. Discussion of consumption and cost imputations for fuel oil or kerosene, LPG, and purchased steam (the fuels highlighted in this report) is in the procedures used for electricity and natural gas. Imputation procedures for these two fuels are also described in Reference 1. Further information on data limitations is given in Reference 2. This appendix also discusses the computation and use of sampling errors.

One way to judge the validity of survey estimates is to compare them with similar types of estimates from other sources. Unfortunately, since no national counts of the nonresidential building stock exist, and since no national probability sample surveys of this population are known to have been previously undertaken, such comparisons cannot be made for building characteristics data. The lack of prior information also made it impossible to use techniques such as ratio estimation or post-stratification to improve the survey estimator. However, certain comparisons can be made between energy consumption data from this survey and data from other sources. The comparisons are mentioned later in this section.

One of the major goals of the NBECS was to produce estimates of energy consumption and expenditures (cost) for nonresidential buildings during calendar year 1979. To accomplish this, consumption and cost data were collected from fuel suppliers. The suppliers were given permission to release the data by means of waivers signed by building representatives.

The fuels used in buildings can be split into two major types:

1. Fuels that are transmitted from the suppliers to the building as needed for immediate use, such as electricity, natural gas, and steam. These fuels, referred to as continuous delivery fuels, are ordinarily not stored. Their consumption is usually measured by meters or gauges attached to the transmission medium (wires or pipes).
2. Fuels that are delivered in bulk to the building and can be stored for future use, such as fuel oil, LPG, and coal. These fuels, measured at the time of delivery, are referred to as discrete delivery fuels.

Billing for continuous delivery fuels is accomplished by reading the gauge(s) or meter(s), usually at regular intervals. The fuel amount on the bill thus represents fuel consumption since the last meter reading. Discrete delivery fuel bills are based on the amount of fuel delivered. The actual consumption occurs later. The delivered amount may or may not equal the amount consumed since the previous delivery.

Ideally, the data for each continuous delivery fuel used in each sample building should have been in the form of complete data records for consecutive billing periods either totally or partially contained in calendar year 1979, covering exactly the energy consumed within the sampling building. The data for each discrete delivery fuel should have been in the form of complete data records for all deliveries from December 1978 through January 1980. The delivered fuel should have been used entirely within the sampling building. However, there were several ways in which the actual data varied from the ideal. The major problems were:

1. The data covered more than the energy used in the sample building. The data could cover such activities as consumption in other buildings or consumption for outside lighting, signs, security equipment, or other activities affiliated with, but not carried on inside, the sample building.

2. The utility would not or could not provide the cost and/or consumption data for some or all billing periods or deliveries in 1979. Reasons for missing data include utility company refusal; archived, lost, or destroyed billing records; and waiver refusal on the part of the building respondent.

3. When several sample buildings in an energy supplier service area did not grant a waiver allowing individual collection of consumption and expenditures data, the supplier was asked to supply aggregate data for all such buildings. The aggregation procedure was carried out to protect the confidentiality of the sample buildings while collecting their consumption data.

4. Data were supplied for billing periods or deliveries in 1979, but the month and/or day of the meter reading or delivery was omitted.

5. Most of the cases of complete reporting of 1979 data for continuous delivery fuels included billing periods that overlapped into 1978 and 1980.

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1A billing period is the time period between two adjacent estimates of meter readings for purposes of billing a customer. A meter reading date or billing date marks the end of a billing period. The next billing period begins on the following day.
Problems 1 and 3 required disaggregation of fuel consumption. Disaggregation was performed for fuel oil or kerosene, LPG, and steam consumption in exactly the same way as for electricity and natural gas (see Appendix B of Reference 1 for details). Problems 4 and 5, overlapping billing periods and missing dates, were handled in exactly the same way for steam (a continuous delivery fuel) as they were for electricity and natural gas (Reference 1). Overlapping billing periods did not affect the discrete delivery fuels because, for them, all deliveries during 1979 were accumulated. There was no such thing as an "overlapping delivery." For the same reasons, missing dates did not matter for fuel oil or kerosene and LPG records, as long as all deliveries in 1979 could be identified.

The remaining problem, missing cost and/or consumption data for some or all billing periods or deliveries, was common to all fuels, but the procedures used for imputation were somewhat different for the other three fuels than they were for electricity and natural gas. Of the three fuels highlighted in this report, the fuel whose delivery method most closely resembles that of electricity and natural gas is, of course, steam, the other continuous delivery fuel. As a matter of fact, many of the same utilities that produce/distribute natural gas and electricity also distribute steam, which is a byproduct of their other processing operations. There the similarities end, however. Whereas electricity and natural gas are supplied to a majority of nonresidential buildings, steam is supplied to only about 1 percent. Most buildings supplied with steam are very large, and the vast majority of buildings that are supplied with steam use it for space heating. Also, a large percentage of sample buildings supplied with steam had no consumption or cost data reported (48 percent or 221 buildings out of 461). The results for industrial buildings were especially bad, with complete consumption data available for only 3 of 38 sample buildings, and most of the rest having no consumption data at all. Because end-use patterns for steam in industrial buildings are different from the patterns in commercial buildings, EIA felt that steam consumption for industrial buildings could not be imputed. Therefore, industrial buildings were excluded from the imputation procedures.

Because of the large proportion of cases with missing data and because the buildings without data were smaller than the ones with data, regression procedures to impute for totally missing steam consumption in commercial buildings did not yield adequate results (details of problems encountered are discussed in Reference 2). Instead, EIA took the input records for the final attempted steam regression and the records needing imputation and sorted them into four strata defined by the predicted consumption values. For each imputation record in a stratum, EIA selected a random input record from the same stratum and computed its actual steam consumption per square foot. That ratio was then multiplied by the square footage of the building associated with the imputation record to produce a consumption estimate for the imputation record. Stated algebraically, the consumption estimate $Q$ for the imputation record is given by

$$Q = \frac{Q_i}{F_i} \cdot F_p,$$

where $Q_i$ is the actual 1979 steam consumption for the input record, $F_i$ is the square footage of the associated building, and $F_p$ is the square footage of the building associated with the imputation record. After consumption was imputed, cost was imputed using separate unweighted linear regression of cost on consumption for records in two classes: consumption <30 million pounds and consumption ≥30 million pounds. The procedures used were exactly the same as those for electricity and natural gas. The cost-consumption regressions were well behaved and produced quite reasonable results.
Appendix B (Continued)

Imputations for partially missing steam data were carried out using the same procedures followed for electricity and natural gas. Because only a relatively few records had partially missing steam data (Table B1), the effect of these imputation procedures on total steam consumption was insignificant.

Table B1 also shows the response pattern for the two discrete delivery fuels for which imputations were performed, fuel oil or kerosene and LPG. There were many cases in which part of a year's data was available, but some deliveries were known to be missing, or data for one or more of several suppliers were missing, even though responding suppliers had reported all their 1979 deliveries. For purposes of imputation, these cases were treated as if no data were available. Thus no cases are shown in the middle columns of the table for these fuels.

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Days of 1979 Consumption Data Reported</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;30</td>
</tr>
<tr>
<td>Fuel Oil or Kerosene</td>
<td>491</td>
</tr>
<tr>
<td>LPG</td>
<td>92</td>
</tr>
<tr>
<td>Steam</td>
<td>186</td>
</tr>
</tbody>
</table>

a Not applicable.

All missing consumption was imputed by an unweighted multiple linear regression procedure similar to that used for completely missing electricity and natural gas consumption. The set of potential predictor variables for fuel oil or kerosene and LPG is shown in Table B2. The final regressions were carried out in 20 building-type categories for fuel oil or kerosene and 11 categories for LPG. The number of input records in the regression categories ranged from 16 to 75 for fuel oil or kerosene and from 17 to 41 for LPG. R² values (which measure the proportion of the total sum of squares of the input records that is explained by the regression equations) ranged from 0.436 to 0.965 for fuel oil or kerosene and from 0.539 to 0.977 for LPG. Cost was then imputed from consumption using a single linear regression model. The final cost and consumption values for a record were the predicted values from the appropriate regression adjusted by a residual selected from the set of residuals for the records. However, if a record needing imputation had partial consumption data that were greater than the imputed value, the reported consumption and cost (if available) were used as the final consumption and cost for the record; that is, the partial data were treated as being essentially complete.


Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
Table B2. Predictor Variables Used in Fuel Oil or Kerosene and LPG Consumption Regressions

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>End-use dummy variables—Yes/No for space heating, air conditioning, water heating, cooking, manufacturing, and electricity generation</td>
</tr>
<tr>
<td>2.</td>
<td>Use of another fuel for heat</td>
</tr>
<tr>
<td>3.</td>
<td>Year constructed</td>
</tr>
<tr>
<td>4.</td>
<td>Square footage</td>
</tr>
<tr>
<td>5.</td>
<td>Square footage, heated</td>
</tr>
<tr>
<td>6.</td>
<td>Hours of operation</td>
</tr>
<tr>
<td>7.</td>
<td>Number of employees</td>
</tr>
<tr>
<td>8.</td>
<td>Percentage of glass on outside walls</td>
</tr>
<tr>
<td>9.</td>
<td>Whether or not insulation added</td>
</tr>
<tr>
<td>10.</td>
<td>Number of floors</td>
</tr>
<tr>
<td>11.</td>
<td>Heating degree-days</td>
</tr>
<tr>
<td>12.</td>
<td>Cooling degree-days</td>
</tr>
<tr>
<td>13.</td>
<td>Tank capacity</td>
</tr>
<tr>
<td>14.</td>
<td>Tank inventory</td>
</tr>
<tr>
<td>15.</td>
<td>Weather zone (coded as a set of dummy variables)</td>
</tr>
<tr>
<td>16.</td>
<td>Ability to control heat</td>
</tr>
<tr>
<td>17.</td>
<td>Number of boilers</td>
</tr>
</tbody>
</table>


Although consumption and cost imputations for fuel oil or kerosene and LPG were carried out for all sample buildings (as was the case for electricity and natural gas, but not steam), the statistics in this report pertain only to commercial buildings. Buildings that are totally or primarily industrial vary enormously in their fuel consumption and expenditures, so much so that national consumption and expenditures totals for industrial buildings are unpublished. National totals for all nonresidential buildings had sampling errors more than twice as large as the errors shown for all commercial buildings in this report, solely because of the variability inherent in industrial buildings. The commercial buildings population upon which this report is largely based includes buildings whose main activity or activities are commercial, but may also have one or more industrial activities occupying a minority of the floor space.

Because no known energy consumption surveys of the U. S. building stock had been attempted before the NBECS, there are no other estimates of commercial consumption based on statistics collected for the point of consumption. However, the Energy Information Administration has published
Appendix B (Continued)

other statistics on commercial consumption by fuel, in its Monthly Energy Review (MER), its Annual Report to Congress (ARC), and its State Energy Data Report (References 3-5). These data are based on utility sales and supply data. Although each of these data systems uses different methods to generate its final estimate, the estimates are somewhat related. For example, the introduction to the State Energy Data System (SEDS) Report states that "a prime requisite in the development of the SEDS data series was that the summations of State data to national totals in SEDS equals as closely as possible the national totals for each energy type and end-use sector that appear in ... the Monthly Energy Review (MER),..., and Annual Report to Congress, Volume Two (ARC-2)."

Comparisons of NBECS consumption estimates for natural gas and electricity with values from these other sources are shown in Reference 1. Unfortunately, uniform comparisons with all these sources are not possible for fuel oil or kerosene, LPG, and purchased steam because of problems of definition and allocation of fuels to sectors. Steam consumption (or production, or sales) is not identified in any other source, and petroleum products are handled so differently by each of the other three sources that it is impossible to make any meaningful comparisons.

One component of total survey error that can be estimated is sampling error. However, the complex multistage, multiframe design of a survey such as the NBECS makes it almost impossible to construct an exact algebraic variance estimator. The method used to produce sampling variances for this survey is balanced half-sample replication (see References 6 and 7). To apply the half-sample technique to this survey, the 79 sample primary sampling units (PSU's) were grouped into 37 strata. Eighteen of the strata were self-representing; that is, they consisted of large metropolitan areas (each represented by one or more sample PSU's) that came into the sample with certainty. In these strata, segments were divided into two replication groups. Each of the remaining 19 strata consisted of two or more sample PSU's belonging to the same Census region. The two replication groups in these strata consisted of one or more PSU's each.

Variance estimates for survey statistics were created by computing 40 half-sample estimates for each statistic. Each half-sample estimate was formed by selecting one of the two replication groups from each stratum, using an orthogonal matrix technique adapted from an article by Blackwelder and Burman (Reference 8). Then the sampling weights were adjusted so that the half-sample estimates would be essentially unbiased estimates of the corresponding population parameter, as was the estimate based on the entire national sample.

The variance estimate for the survey estimate \( \hat{X} \) of characteristic \( X \) is given by

\[
S^2_{\hat{X}} = \frac{1}{40} \sum_{i=1}^{40} (\hat{X}_{1i} - \hat{X})^2,
\]

where \( \hat{X}_{1i} \) is the \( i \)th half-sample estimate of \( X \). The standard error of \( \hat{X} \), the measure of variability used in the text, is given by

\[
S_{\hat{X}} = \sqrt{S^2_{\hat{X}}},
\]

The relative standard error (RSE) of \( \hat{X} \), the error form used in the core tables (Appendix C), is given by

\[
RSE(\hat{X}) = \frac{S_{\hat{X}}}{\hat{X}}
\]
Tables C1 through C10 show relative standard errors for each statistic presented in the detailed tables. Certain statistics have been suppressed from both the detailed tables and the error tables because of concerns about their sampling variability. They have been replaced by entries of "Q" in the appropriate table cells. Each estimate of consumption, expenditures, and average square footage per building whose relative standard error exceeded 50 percent was suppressed. In some cases, estimates with RSE's under 50 percent were also suppressed if the estimates would have stood out in rows of otherwise suppressed data, since the acceptability of the estimate may have been due to the instability of its RSE estimate. All estimates of number of buildings and aggregate square footage have been retained to give the reader some idea, however rough, of the size of each population subgroup.

There are two types of statistics presented in the text whose errors cannot be found in Tables C1 through C10: percentage statistics and statistics for collapsed population subgroups not found in the tables. The relative standard errors of percentage statistics \( P' = \frac{X'}{Y'} \) were computed using the formula

\[
\text{RSE} (P') = \left[ \text{RSE} (X') \right]^2 - \left[ \text{RSE}(Y') \right]^2.
\]

For example, the last two sentences of the third paragraph under the heading "Fuel Oil" in the "Summary of Findings" state that 20 percent (+3) of the buildings supplied with fuel oil use it for water heating. The statistic is based on a numerator of 169,000 buildings and a denominator of 815,000 buildings (Table 6). From Table C6 the RSE's of these two estimates are 13.1 percent and 10.3 percent, respectively, so that the RSE of the ratio is estimated by

\[
\text{RSE} (P') = (0.131)^2 - (0.103)^2 = 0.081.
\]

The two standard error interval around the 20-percent estimate is of width \( (20) (0.081) (2) = 3 \) percent, the value given in parentheses following the statistic.

The relative standard error of an estimate for a collapsed population subgroup was approximated by the relative standard error of the same type of statistic with about the same value, for a population subgroup with a similar estimated number of buildings. For example, the first paragraph in the "Building Type" section of the "Summary of Findings" states that office buildings, retail sales and service buildings, and warehouse and storage buildings together consumed 43 percent (+3) of the total energy used in commercial buildings. These three building types comprise an estimated 1,679,000 buildings and an estimated 2.324 quadrillion Btu of consumption (Table 2). The population subgroup with the consumption estimate closest to this value is buildings for which weatherstripping or caulking has been added since 1974, with an estimated 2.297 quadrillion Btu consumed by 1,435,000 buildings. Since the number of buildings in this subgroup is reasonably close to the combined total for three building types, the estimated RSE of 0.075 for the consumption estimate (Table C2) is used as the RSE of the 2.324 quadrillion Btu value for the combined building types. Total commercial consumption, an estimated 5.457 quadrillion Btu, has an RSE of 0.064 (Tables 2 and C2); therefore, the RSE for the 43-percent estimate is given by

\[
\text{RSE} (0.43) = (0.075)^2 - (0.064)^2 = 0.039,
\]

and the two standard error interval around the estimate is of width \( (43) (0.039) (2) = 3 \) percent, the value given in parentheses.
Using Error Estimates to Test Statistical Hypotheses

The analytical statements in this report can be divided into three types. The first type is the expository statement, which presents a statistic for its own sake, without reference or comparison to any other statistic. An example of such a statement is found in sentence 3 of the second paragraph in the "Summary of Findings": "Average consumption was 115,100 Btu per square foot (+10,000) and 85 million Btu per employee (+9)." No statistical tests of hypotheses are needed or were performed for such statements; twice the standard error is given in parentheses after the estimate. This value serves as a measure of the level of variability in the statistic and allows the reader to compute an approximate 95-percent confidence interval for the estimate by adding and subtracting the value in parentheses.

The second type of statement is the descriptive statement, which is intended as a summary statement of a data relationship or relationships that exist in a table. An example of this type of statement is found in the first sentence of the second to last paragraph in the "Fuel Oil" section of the "Summary of Findings": "Fuel oil buildings that had undertaken conservation measures usually had lower estimates of consumption per square foot than those that did not (although the differences were not significant)." Such statements are meant to give general impressions and are not subject to statistical justification.

The third, and most commonly occurring type of statement, is the stated or implied comparison between two or more statistics. Such comparisons are meant to point out specific similarities and differences between population subgroups, sometimes in support of the summary statements discussed earlier. Since these statements imply specific relationships among population subgroups based on sample data, they are inferential and subject to statistical testing. Examples of such comparisons are:

1. The last sentence in the "Building Type" section: "The average price per million Btu varied widely by building type, ranging from $5.02 (+ $0.54) for health care buildings to $8.30 (+ $1.28) for office buildings."

2. The second sentence of the third paragraph in the "Location" section: "Average per building consumption and expenditures were about twice as high for buildings in the Northeast ... as in the South and West regions."

The test used to check this kind of statement is the standard normal deviate test. To test the significance of the difference between estimates $Y'$ and $Y$, $X'$ and $Y'$ are assumed to be normally distributed by appeal to the Central Limit Theorem. Then the test statistic

$$ Z = \frac{X' - Y'}{S_{X'}^2 + S_{Y'}^2} $$

is computed, with $Z$ having approximately a standard normal distribution. The null hypothesis, that there is no difference between $X'$ and $Y'$, is rejected if $Z$ is greater than some critical value $G$. In this report, $G$ is set so that the level of significance of the test (the probability of incorrectly detecting a significant difference) is 0.05. Ordinarily, this level of significance corresponds to a critical value of 1.96, and when a comparison is the only possible one of its type, 1.96 is the correct value. However, most of the statements in this report involve comparisons that were selected from a larger set of possible comparisons, each of which had an opportunity to be tested and
falsely yield a significant difference. To attain a true level of significance no greater than 0.05 for a particular test from such a set, the critical value \( G \) was adjusted so that the probability of falsely detecting any significant difference was \( 0.05/G \). The rationale for this adjustment is based on the Bonferroni inequality, which is discussed elsewhere (see References 9 and 10).

The normal test of a hypothesis with adjusted critical value can be applied to the examples as follows:

1. The range statement for price variability (for all five fuels combined) implies a significant difference between the two prices shown. The number of possible comparisons among the 12 building-type categories is the combinational \( \binom{12}{2} = 66 \), so the critical value for the test is the normal two-tailed \( 0.05/66 = 0.00076 \) critical value, which, from the normal tables, is 3.40.

   The test statistic for the comparison is

   \[
   Z = \frac{\$8.30 - \$5.02}{\sqrt{\left(\$0.64\right)^2 + \left(\$0.27\right)^2}} = \frac{3.28}{0.70} = 4.69.
   \]

   The \( Z \) value exceeds the critical value of 3.40, so the difference is significant and the statement is justified.

2. The pertinent parameter and error estimates came from Tables 2 and C2, and are summarized below:

<table>
<thead>
<tr>
<th>Region</th>
<th>Consumption per Building (Million Btu)</th>
<th>Expenditures per Building (Thousand Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Estimate</td>
<td>Standard Error</td>
</tr>
<tr>
<td>Northeast</td>
<td>2,039</td>
<td>285</td>
</tr>
<tr>
<td>South</td>
<td>1,058</td>
<td>105</td>
</tr>
<tr>
<td>West</td>
<td>1,044</td>
<td>129</td>
</tr>
</tbody>
</table>


The total number of possible regional comparisons for each of the two statistics is the combinational \( \binom{2}{2} = 6 \), so the total number of possible comparisons is 12. The critical value for all tests is, therefore, the normal two-tailed \( 0.05/12 = 0.042 \) critical value, which, from the normal tables, is 2.865.
Four different comparisons are being made: Northeast versus South and West for average consumption and average expenditures. The test statistics for these comparisons are

\[
Z_1 = \frac{2039 - 1058}{(285)^2 + (105)^2} = \frac{918}{304} = 3.23
\]

\[
Z_2 = \frac{2039 - 1044}{(285)^2 + (129)^2} = \frac{995}{312} = 3.19
\]

\[
Z_3 = \frac{15.4 - 7.7}{(1.8)^2 + (0.5)^2} = \frac{7.7}{1.9} = 4.05
\]

\[
Z_4 = \frac{15.4 - 6.8}{(1.8)^2 + (1.3)^2} = \frac{8.6}{2.2} = 3.91
\]

All four Z values exceed the critical value of 2.865, so the differences are significant and the statement is justified.
References


Appendix C

Relative Standard Error Tables

571 MILLION Btu (± 273)
Table C1. Total Square Footage for Commercial Buildings, as of January 1, 1980—Relative Standard Errors (Percent)

<table>
<thead>
<tr>
<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL BUILDINGS (THOUSANDS)</th>
<th>AVERAGE FEET PER BUILDING</th>
<th>MEDIAN FEET PER BUILDING</th>
<th>TOTAL SQUARE FOOTAGE BY BUILDING SQUARE FOOTAGE CATEGORIES (MILLION SQUARE FEET)</th>
<th>FOOD</th>
<th>FOR LESS</th>
<th>TO 5,000</th>
<th>TO 10,000</th>
<th>TO 15,000</th>
<th>TO 25,000</th>
<th>OVER 50,000</th>
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<td>4.0</td>
<td>4.6</td>
<td>6.0</td>
<td>9.3</td>
<td>5.4</td>
<td>7.3</td>
<td>7.9</td>
<td>9.1</td>
<td>7.6</td>
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</tr>
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<td>END USE BY FUEL TYPE......</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
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<td>3.6</td>
<td>3.9</td>
<td>6.0</td>
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<td>4.6</td>
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<td>9.5</td>
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<td>12.1</td>
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<td>9</td>
<td>Q</td>
<td>Q</td>
<td>Q</td>
<td>Q</td>
<td>Q</td>
<td>Q</td>
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<td>12.9</td>
<td>27.2</td>
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SEE NOTES AT END OF TABLE

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
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## Appendix C (Continued)

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See notes at end of table.

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
## Appendix C (Continued)

### Table C1. (Continued)

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<th>MEDIAN SQUARE FEET PER</th>
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**PERCENT OF BUILDING HEATED**

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<th>51 TO 75</th>
<th>76 TO 99</th>
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**PERCENT OF BUILDING COOLED**

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**AIR CONDITIONING SYSTEM**

| WINDOW UNITS               | 6.2     | 7.8      | 9.1      | 10.9     | 20.5 | 7.4   |
|                            | 12.9    | 6.5      | 6.0      | 9.3      | 17.0 | 17.8  |
| PACKAGE UNITS              | 7.2     | 7.4      | 8.0      | 8.3      | 15.0 | 9.0   |
| CENTRAL SYSTEM             | 10.3    | 12.7     | 22.5     | 9.5      | 47.5 | 19.2  |
| MO AIR CONDITIONING        | 9.1     | 5.5      | 6.4      | 10.4     | 11.3 | 9.9   |

See notes at end of table.
### Table C1. (Continued)

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### Table C1. (Continued)

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### Table C1. (Continued)

#### BUILDING CHARACTERISTICS

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**NOTE:** A "-" = NOT APPLICABLE. Q = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. DATA MAY NOT SUM TO TOTALS DUE TO ROUNDING OR MULTIPLE ENERGY SOURCES. SEE GLOSSARY FOR DEFINITIONS OF TERMS USED IN THIS TABLE. SEE APPENDIX B FOR DISCUSSION OF LIMITATIONS OF DATA.

**Source:** Residential and Commercial Branch, Energy End Use Division, Office of Energy Markets and End Use, Energy Information Administration, the 1979 Nonresidential Buildings Energy Consumption Survey.
### Table C2. Consumption and Expenditures for Major Fuels (Natural Gas, Electricity, Fuel Oil or Kerosene, LPG, and Steam) in Commercial Buildings Supplied with One or More of These Fuels, 1979—Relative Standard Errors (Percent)

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**see Notes at end of Table**

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**Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures Steam, Fuel Oil, LPG, and All Fuels**

Energy Information Administration
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ENERGY SOURCES SUPPLIED TO THE BUILDING

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Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
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### HEATING SYSTEM

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### PERCENT OF BUILDING HEATED

| 1 TO 25                | 8.6 | 9.4 | 7.1 | 13.7 | 12.7 | 11.6 | 12.9 | 11.6 | 10.3 | 11.9 |
| 26 TO 50               | 11.1| 10.9| 9.2 | 16.6 | 15.3 | 15.1 | 15.1 | 15.9 | 20.2 | 19.2 |
| 51 TO 75               | 10.6| 10.3| 9.3 | 16.1 | 15.1 | 14.7 | 14.9 | 16.0 | 16.4 | 16.4 |
| 76 TO 99               | 12.9| 11.3| 11.6| 14.8 | 17.0 | 17.7 | 18.6 | 17.9 | 17.7 | 17.7 |
| 100                    | 6.2 | 7.0 | 4.2 | 9.8 | 5.5 | 5.3 | 6.0 | 5.8 | 5.0 | 5.0 |
| NONE                   | 16.9| 15.7| 14.8| 17.7 | 16.7 | 15.8 | 17.8 | 17.0 | 17.3 | 17.3 |

### PERCENT OF BUILDING COOLED

| 1 TO 25                | 7.9 | 7.1 | 5.1 | 14.9 | 15.3 | 14.7 | 14.9 | 16.5 | 9.5 | 9.5 |
| 26 TO 50               | 9.4 | 9.6 | 5.4 | 11.6 | 11.3 | 11.2 | 9.6 | 9.6 | 9.6 | 9.6 |
| 51 TO 75               | 9.7 | 7.1 | 12.1| 9.0 | 12.7 | 6.3 | 7.6 | 20.4 | 12.6 | 12.6 |
| 76 TO 99               | 13.4| 10.3| 14.1| 11.9 | 15.3 | 5.3 | 6.5 | 21.5 | 13.9 | 13.9 |
| 100                    | 12.7| 11.2| 8.5 | 10.5 | 9.4 | 5.9 | 7.0 | 12.1 | 7.1 | 7.1 |
| NONE                   | 9.1 | 10.5| 5.8 | 9.1 | 5.3 | 7.4 | 7.0 | 6.6 | 6.3 | 6.3 |

### AIR CONDITIONING SYSTEM

| WINDOW UNITS       | 6.2 | 10.9| 7.8 | 21.6 | 20.9 | 21.3 | 22.1 | 23.5 | 12.9 | 13.1 |
| PACKAGE UNITS      | 12.9| 9.3 | 6.5 | 9.2 | 8.7 | 5.6 | 7.0 | 9.7 | 6.2 | 6.2 |
| CENTRAL SYSTEM     | 7.2 | 6.3 | 7.4 | 6.7 | 6.0 | 4.6 | 7.0 | 7.9 | 6.0 | 6.0 |
| COMBINATION/OTHER | 10.3| 9.5 | 12.7| 11.2| 14.9| 8.9| 13.7| 13.3| 9.0| 9.0 |
| NO AIR CONDITIONING| 9.1 | 10.5| 5.8 | 9.1 | 5.3 | 7.4 | 7.0 | 6.6 | 6.3 | 6.3 |

See Notes at End of Table
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**Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures**
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
Table C2. (Continued)

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NOTE: A "-" = NOT APPLICABLE. Q = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. DATA MAY NOT SUM TO TOTALS DUE TO REcoupon OF MULTIPLE ENERGY SOURCES. SEE GLOSSARY FOR DEFINITIONS OF TERMS USED IN THIS TABLE. SEE APPENDIX 5 FOR DISCUSSION OF LIMITATIONS OF DATA.

SOURCE: RESIDENTIAL AND COMMERCIAL BRANCH, ENERGY END USE DIVISION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY INFORMATION ADMINISTRATION, THE 1979 NONRESIDENTIAL BUILDINGS ENERGY CONSUMPTION SURVEY.

Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
Table C3. Consumption and Expenditures for Major Fuels (Natural Gas, Electricity, Fuel Oil, LPG, and Steam) in Commercial Buildings Supplied with One or More of These Fuels, 1979—Relative Standard Errors (Percent), Census Region: Northeast

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Table C3. (Continued)
Census Region: Northeast

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Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures - Steam, Fuel Oil, LPG, and All Fuels Energy Information Administration
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Census Region: Northeast

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**Nonresidential Buildings Energy Consumption Survey:**
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration

SEE NOTES AT END OF TABLE
### Table C3. (Continued)
Census Region: Northeast

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Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
### Table C3. (Continued)
Census Region: Northeast

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Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
### Table C3. (Continued)
Census Region: North Central

#### END USE BY FUEL TYPE
- **Heating Fuel Used**: Natural Gas: 10.6, Other: 11.2, Electric: 15.2, Fuel Oil/Kerosene: 21.3, Steam: 21.6, Other: 22.9
- **No Heating Fuel Used**: Natural Gas: 37.1, Other: 55.7

#### Air Conditioning Fuel Used
- **Commercial Buildings**: Natural Gas: 10.9, Electric: 12.6, Other: 13.8
- **No Air Conditioning Fuel Used**: Natural Gas: 62.0, Electric: 34.6, Other: 24.8

#### Water-Heating Fuel Used
- **Commercial Buildings**: Natural Gas: 11.2, Electric: 16.0, Other: 1.6
- **No Water-Heating Fuel Used**: Natural Gas: 39.3, Electric: 28.6, Other: 28.2

#### Manufacturing Fuel Used
- **Commercial Buildings**: Natural Gas: 11.4, Electric: 14.7, Other: 6.8
- **No Manufacturing Done**: Natural Gas: 14.3, Electric: 11.6, Other: 11.1

#### Cooking Fuel Used
- **Commercial Buildings**: Natural Gas: 13.2, Other: 6.3
- **No Cooking Fuel**: Natural Gas: 12.1, Other: 10.5

### SEE NOTES AT END OF TABLE

---

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration

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### Table C3. (Continued)

Census Region: North Central

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<th>Total Buildings (Thousands)</th>
<th>Total Square Feet (MILLIONS)</th>
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Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
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Census Region: North Central

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| FUEL COMBINATIONS USED   |                             |                              |                                             |                                     |                                          |                                          |                                                  |
| ONE FUEL USED            | 36.1                        | 29.3                         | 12.8                                        | 32.7                                | 27.3                                     | 22.7                                     | 27.3                                            |
| TWO FUELS USED           | 25.8                        | 19.6                         | 7.9                                         | 25.3                                | 20.1                                     | 13.8                                     | 20.1                                            |
| ELEC., NATURAL GAS.      | 26.9                        | 19.6                         | 7.9                                         | 25.3                                | 20.1                                     | 13.8                                     | 20.1                                            |
| ELEC., FUEL OIL/KEROSENE.| 36.7                        | 45.0                         | 14.5                                        | 41.4                                | 29.2                                     | 23.3                                     | 23.3                                            |
| ELEC., LPG               | 16.0                        | 32.2                         | 12.5                                        | 25.5                                | 13.3                                     | 18.9                                     | 18.9                                            |
| ELEC., GAS, OTHER        | 25.8                        | 53.3                         | 25.6                                        | 43.5                                | 28.7                                     | 22.9                                     | 22.9                                            |
| ELEC., FUEL OIL/KEROSENE.| 22.3                        | 35.9                         | 14.6                                        | 46.9                                | 31.3                                     | 26.2                                     | 26.2                                            |
| ELEC., FUEL OIL/KEROSENE, LPG | 16.0 | 32.2 | 12.5 | 25.5 | 13.3 | 18.9 | 18.9 |
| ELEC., GAS, OTHER        | 35.7                        | 53.3                         | 14.6                                        | 46.9                                | 31.3                                     | 26.2                                     | 26.2                                            |
| FOUR OR MORE FUELS USED. | 50.2                        | 57.3                         | 12.1                                        | 43.5                                | 28.7                                     | 22.9                                     | 22.9                                            |

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Census Region: North Central

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Nonresidential Buildings Energy Consumption Survey: 1974 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
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**Census Region: North Central**

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Census Region: North Central

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Note: A "-" = Not applicable. Q = Data withheld because of a large variance. Data may not sum to totals due to rounding or multiple energy sources. See glossary for definitions of terms used in this table. See Appendix E for discussion of limitations of data.

### Appendix C (Continued)

**Table C3.** (Continued)  
Census Region: South

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#### End Use by Fuel Type

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*Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures*  
*Steam, Fuel Oil, LPG, and All Fuels*  
*Energy Information Administration*
## Appendix C (Continued)

### Table C3. (Continued)
Census Region: South

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#### Heating and Cooling Degree-Days

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See notes at end of table.

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Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
### Appendix C (Continued)

#### Table C3. (Continued)
Census Region: South

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**FUEL COMBINATIONS USED**

| ONE FUEL USED            | 27.1            | 25.8              | 12.7                                | 29.5                                     | 11.7                                                | 12.4                   | 35.9                                    | 12.1                            | 7.1                                 |                                 |
| TWO FUELS USED           | 14.4            | 17.1              | 8.6                                 | 33.7                                     | 8.7                                                | 6.6                    | 13.6                                    | 10.8                            | 7.5                                 |                                 |
| ELEC., NATURAL GAS       | 21.6            | 22.3              | 13.3                                | 17.0                                     | 15.7                                                | 16.1                   | 16.8                                    | 14.5                            | 7.9                                 |                                 |
| ELEC., FUEL OIL/KEROSENE | 21.7            | 25.4              | 4.8                                 | 24.2                                     | 13.0                                                | 31.2                   | 26.6                                    | 16.6                            | 7.6                                 |                                 |
| ELEC., LPG               | 21.7            | 31.5              | 16.6                                | 31.6                                     | 22.7                                                | 25.5                   | 34.8                                    | 20.9                            | 16.2                                |                                 |
| OTHER                    | 39.3            | 41.6              | 27.6                                | 40.6                                     | 47.3                                                | Q                     | Q                                       | 47.7                            | 42.9                                | 14.6                            |

**THREE FUELS USED**

| ELEC., GAS, FUEL OIL/ KEROSENE | 15.4          | 18.1              | 23.1                                | 22.4                                     | 12.1                                                | 12.1                   | 18.3                                    | 25.6                            | 6.6                                 |                                 |
| ELEC., FUEL OIL/KEROSENE, LPG | 29.3          | 23.0              | 19.9                                | 27.0                                     | 30.3                                                | 17.6                   | 27.3                                    | 33.0                            | 10.7                                |                                 |
| ELEC., GAS, OTHER         | 32.5          | 42.6              | 36.4                                | 45.2                                     | 36.1                                                | Q                     | 21.5                                    | 40.1                            | 12.0                                |                                 |
| OTHER                     | 59.6          | 61.7              | 39.7                                | 39.7                                     | 35.2                                                | 20.3                   | 40.1                                    | Q                               | 10.9                                |                                 |
| FOUR OR MORE FUELS USED   | 37.1          | 33.2              | 38.7                                | 31.0                                     | 30.6                                                | 32.5                   | Q                                       | 25.7                            |                                     |                                 |

**ENERGY SOURCES SUPPLIED TO THE BUILDING**

| ELECTRICITY               | 10.6           | 12.0              | 6.2                                 | 11.1                                     | 9.0                                                 | 11.1                   | 10.8                                    | 7.9                             | 6.6                                 | 10.6                            |
| NATURAL GAS              | 20.5           | 19.3              | 14.6                                | 38.2                                     | 11.1                                                | 11.1                   | 10.8                                    | 34.7                            | 7.4                                 |                                 |
| FUEL OIL/KEROSENE        | 17.4           | 17.3              | 8.8                                 | 19.2                                     | 16.2                                                | 13.2                   | 8.0                                     | 16.1                            | 9.4                                 | 8.6                              |
| LIQUID PETROLEUM GAS     | 16.8           | 26.3              | 17.2                                | 20.5                                     | 19.9                                                | 25.3                   | 30.1                                    | 10.3                            | 11.8                                | 15.3                            |
| OTHER                    | 16.3           | 20.6              | 31.1                                | 37.5                                     | 30.2                                                | 27.8                   | 23.3                                    | 27.4                            | 34.9                                | 14.1                            |

**SEE NOTES AT END OF TABLE**

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration

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### Table C3. (Continued)
Census Region: South

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1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
### Table C3. (Continued)

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See notes at end of table.

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Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
### Table C3. (Continued)

#### Census Region: South

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<th>AVERAGE AMOUNT CONSUMED PER BUILDING (MILLION BTU)</th>
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**NOTE:** A "-" = NOT APPLICABLE. Q = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. DATA MAY NOT SUM TO TOTALS DUE TO ROUNDING OR MULTIPLE ENERGY SOURCES. SEE GLOSSARY FOR DEFINITIONS OF TERMS USED IN THIS TABLE. SEE APPENDIX 8 FOR DISCUSSION OF LIMITATIONS OF DATA.

**SOURCE:** RESIDENTIAL AND COMMERCIAL BRANCH, ENERGY END USE DIVISION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY INFORMATION ADMINISTRATION, THE 1979 NONRESIDENTIAL BUILDINGS ENERGY CONSUMPTION SURVEY.
### Building Characteristics

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<th>Average Square Feet (Millions)</th>
<th>Average Amount Consumed Per Building (Million BTU)</th>
<th>Average Amount Consumed Per Individual</th>
<th>Average Amount Consumed Per Employee (Dollars)</th>
<th>Average Square Feet Employed (Million Dollars)</th>
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**End Use by Fuel Type**

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**Energy Information Administration**
### Appendix C (Continued)

#### Table C3. (Continued)

Census Region: West

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**Total Square Footage**

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**Number of Floors**

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**Year Constructed**

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**SEE NOTES AT END OF TABLE**

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Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
Table C3. (Continued)
Census Region: West

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<tr>
<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL BUILDINGS (THOUSANDS)</th>
<th>TOTAL SQUARE FEET (MILLIONS)</th>
<th>AVERAGE AMOUNT CONSUMED PER BUILDING (MILLION BTU)</th>
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Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
## Table C3. (Continued)

### Census Region: West

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<td>13.6</td>
<td>24.9</td>
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### AIR CONDITIONING SYSTEM

| WINDOW UNITS.................... | 13.4                         | 16.9                         | 21.1                                        | 13.6                                     | 16.3                                    | 13.6                                    | 15.9                                 | 16.8                                   | 31.6                                   | 18.0                                   | 10.2                                  |
| PACKAGE UNITS.................... | 14.5                         | 9.0                         | 13.4                                        | 15.6                                     | 15.0                                    | 19.0                                    | 10.7                                 | 13.0                                   | 10.0                                   | 7.0                                    | 7.0                                  |
| CENTRAL SYSTEM................... | 25.9                         | 0.9                         | 30.6                                        | 20.1                                     | 25.6                                    | 5.6                                      | 15.0                                 | 22.6                                   | 21.4                                   | 5.4                                    | 5.4                                  |
| COMBINATION/OTHER............... | 42.0                         | 35.9                         | 30.8                                        | 20.9                                     | 23.6                                    | 26.7                                    | 25.0                                 | 32.0                                   | 18.0                                   | 10.3                                   | 10.3                                 |
| NO AIR CONDITIONING............. | 21.7                         | 20.6                         | 13.9                                        | 27.8                                     | 13.6                                    | 12.7                                    | 13.6                                 | 24.9                                   | 8.1                                    | 9.7                                   | 10.2                                 |

### OCCUPANCY CHARACTERISTICS

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<th>18.0</th>
<th>39.0</th>
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</table>

### MULTIPLE ESTABLISHMENT BUILDING OWNER OR AGENT IS OCCUPANT.................. | 19.0                         | 26.3                         | 31.0                                        | 23.7                                     | 23.6                                    | 8.7                                      | 21.1                                 | 29.4                                   | 28.5                                   | 9.0                                    | 9.0                                  |
| owner or agent is not occupant....................................................... | 13.3                         | 15.6                         | 8.5                                         | 16.6                                     | 15.2                                    | 13.6                                    | 17.6                                 | 37.6                                   | 33.9                                   | 21.1                                  | 21.1                                 |

### GOVERNMENT-OWNED AND OCCUPIED.................................................. | 20.1                         | 35.0                         | 23.0                                        | 30.6                                     | 15.5                                    | 13.0                                    | 16.1                                 | 31.5                                   | 17.9                                   | 16.9                                  | 16.9                                 |
| NOT REPORTED.......................................................... | 39.4                         | 26.7                         | Q                                           | Q                                        | Q                                      | Q                                       | Q                                    | Q                                      | Q                                      | Q                                      | Q                                    |

### NUMBER OF PEOPLE WORKING IN THE BUILDING

| LESS THAN 10......................... | 20.0                         | 21.6                         | 7.2                                         | 25.6                                     | 13.9                                    | 15.0                                    | 11.7                                 | 19.9                                   | 7.8                                    | 10.5                                  | 10.5                                 |
| 10 TO 19............................... | 19.5                         | 8.5                         | 39.3                                        | 9.9                                      | 15.1                                    | 6.4                                      | 38.4                                 | 13.3                                   | 13.0                                   | 9.9                                    | 9.9                                  |
| 20 TO 49.............................. | 18.3                         | 20.7                         | 12.2                                        | 20.4                                     | 19.7                                    | 35.7                                    | 21.4                                 | 34.6                                   | 32.6                                   | 17.9                                  | 17.9                                 |
| 50 TO 99............................... | 13.6                         | 11.4                         | 10.7                                        | 17.6                                     | 12.2                                    | 11.6                                    | 10.9                                 | 15.4                                   | 9.4                                    | 7.2                                   | 7.2                                  |
| 100 OR MORE........................... | 39.7                         | 34.5                         | 44.5                                        | 20.7                                     | 37.6                                    | 16.1                                    | 17.6                                 | 21.0                                   | 38.3                                   | 6.2                                   | 6.2                                  |

SEE NOTES AT END OF TABLE

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures Steam, Fuel Oil, LPG, and All Fuels Energy Information Administration
### Table C3. (Continued)

Census Region: West

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<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL BUILDINGS (THOUSANDS)</th>
<th>TOTAL SQUARE FEET (MILLIONS)</th>
<th>AVERAGE SQUARE FEET PER BUILDING (MILLION BTU)</th>
<th>AVERAGE AMOUNT CONSUMED PER EMPLOYEE (MILLION BTU)</th>
<th>AVERAGE AMOUNT CONSUMED PER THOUSAND FOOT (MILLION BTU)</th>
<th>AVERAGE AMOUNT CONSUMED PER MILLION BTU (DOLLARS)</th>
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NOTE: A "-" = NOT APPLICABLE. Q = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. DATA MAY NOT SUM TO TOTALS DUE TO BUILDING OR MULTIPLE ENERGY SOURCES. SEE GLOSSARY FOR DEFINITIONS OF TERMS USED IN THIS TABLE. SEE APPENDIX B FOR DISCUSSION OF LIMITATIONS OF DATA.

SOURCE: RESIDENTIAL AND COMMERCIAL BRANCH, ENERGY END USE DIVISION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY INFORMATION ADMINISTRATION, THE 1979 NONRESIDENTIAL BUILDINGS ENERGY CONSUMPTION SURVEY.
Table C4. Average Prices per Million Btu for Major Fuels for Commercial Buildings, 1979—Relative Standard Errors (Percent)

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SEE NOTES AT END OF TABLE

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Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
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Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures Steam, Fuel Oil, LPG, and All Fuels Energy Information Administration
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AVERAGE PRICE PER MILLION BTU (DOLLARS)

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YEAR CONSTRUCTED

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FUEL COMBINATIONS USED

| ONE FUEL USED | 31.6 | 6.0 | 6.1 | 29.0 | Q | Q |
| TWO FUELS USED | 1.6 | 4.1 | 3.9 | 1.0 | 2.4 | 4.4 |
| ELEC., NATURAL GAS | 1.9 | 2.9 | 4.5 | - | - | - |
| ELEC., FUEL OIL/KEROSENE | - | 9.0 | 6.7 | 1.9 | - | - |
| ELEC., LPG | - | 19.3 | 12.8 | - | 2.5 | - |
| OTHER | 0 | 19.0 | 7.9 | 0 | 0 | 6.4 |
| THREE FUELS USED | 3.6 | 7.6 | 5.2 | 1.8 | 3.0 | 6.0 |
| ELEC., GAS, FUEL OIL/ KEROSENE | 4.3 | 12.4 | 5.5 | 1.8 | - | - |
| ELEC., FUEL OIL/KEROSENE, LPG | - | 8.7 | 11.4 | 7.0 | 6.7 | - |
| ELEC., GAS, OTHER | 4.9 | 8.6 | 10.2 | - | 9.3 | 7.5 |
| ELEC., FUEL OIL/KEROSENE, OTHER | - | 11.6 | 26.2 | 3.6 | - | 10.7 |
| OTHER | 0 | 8.2 | 6.9 | 0 | 3.5 | 8.1 |
| FOUR OR MORE FUELS USED | 9.3 | 8.2 | 14.6 | 3.4 | 6.4 | 7.5 |

ENERGY SOURCES SUPPLIED TO THE BUILDING

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<th>NATURAL GAS</th>
<th>FUEL OIL/KEROSENE</th>
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<th>COAL</th>
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Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
## Appendix C (Continued)

### Table C4. (Continued)

#### AVERAGE PRICE PER MILLION BTU (DOLLARS)

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<td>CR KEROSENE</td>
<td>FOR AIR CONDITIONING</td>
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<th>76 TO 99</th>
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SEE NOTES AT END OF TABLE

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Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
## Table C4 (Continued)

### AVERAGE PRICE PER MILLION BTU (DOLLARS)

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<td>LIQUID PETROLEUM GAS</td>
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**See notes at end of table**

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Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
Table C4. (Continued)

<table>
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<tr>
<th>BUILDING CHARACTERISTICS</th>
<th>AVERAGE PRICE PER MILLION BTU (DOLLARS)</th>
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NOTE: A "-" = NOT APPLICABLE. 9 * DATA WITHHELD BECAUSE OF A LARGE VARIANCE. DATA MAY NOT SUM TO TOTALS DUE TO ROUNDING OR MULTIPLE ENERGY SOURCES. SEE GLOSSARY FOR DEFINITIONS OF TERMS USED IN THIS TABLE. SEE APPENDIX B FOR DISCUSSION OF LIMITATIONS OF DATA.

SOURCE: NONRESIDENTIAL BUILDINGS ENERGY CONSUMPTION SURVEY. 1979 CONSUMPTION AND EXPENDITURES.

Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
## Appendix C (Continued)

Table C5. Energy Consumption and Expenditures for Commercial Buildings by Fuel Type, 1979—Relative Standard Errors (Percent)

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<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL CONSUMPTION (QUADRILLION BTU)</th>
<th>TOTAL EXPENDITURES (HUNDRED MILLION DOLLARS)</th>
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<td>COMMERCIAL BUILDINGS</td>
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### END USE BY FUEL TYPE

- **HEATING FUEL USED**
  - NATURAL GAS: 6.5
  - FUEL OIL/KEROSENE: 10.3
  - LIQUID PETROLEUM GAS: 15.7
  - STEAM: 22.9
  - OTHER: 43.2

- **COOKING FUEL USED**
  - ELECTRICITY: 7.1
  - NATURAL GAS: 5.0
  - FUEL OIL/KEROSENE: 3.3
  - OTHER: 4.8

- **NO HEATING FUEL USED**
  - TOTAL CONSUMPTION: 16.6
  - TOTAL EXPENDITURES: 16.1

- **AIR CONDITIONING FUEL USED**
  - ELECTRICITY: 7.1
  - NATURAL GAS: 6.5
  - OTHER: 17.7

- **NO AIR CONDITIONING FUEL**
  - TOTAL CONSUMPTION: 9.2
  - TOTAL EXPENDITURES: 9.2

- **WATER-HEATING FUEL USED**
  - ELECTRICITY: 5.6
  - NATURAL GAS: 5.0
  - FUEL OIL/KEROSENE: 13.1
  - OTHER: 16.5

- **NO WATER-HEATING FUEL**
  - TOTAL CONSUMPTION: 6.3
  - TOTAL EXPENDITURES: 6.3

- **MANUFACTURING FUEL USED**
  - ELECTRICITY: 11.2
  - NATURAL GAS: 11.1
  - OTHER: 24.1

- **NO MANUFACTURING DONE**
  - TOTAL CONSUMPTION: 5.7
  - TOTAL EXPENDITURES: 6.1

- **COOKING FUEL USED**
  - ELECTRICITY: 7.5
  - NATURAL GAS: 9.3
  - LIQUID PETROLEUM GAS: 20.6

- **NO COOKING FUEL**
  - TOTAL CONSUMPTION: 5.3
  - TOTAL EXPENDITURES: 5.3

---

非住宅建筑物能源消费调查：
1979年消耗和支出
蒸汽、燃料油、LPG及所有燃料
能源信息行政管理局
### Table C5. (Continued)

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SEE NOTES AT END OF TABLE

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
### Table C5. (Continued)

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#### NUMBER OF FLOORS
- **ONE FLOOR**
  - 6.7
- **TWO FLOORS**
  - 8.6
- **THREE FLOORS**
  - 12.4
- **MORE THAN THREE**
  - 9.0

#### YEAR CONSTRUCTED
- **1900 OR BEFORE**
  - 14.6
- **1901 TO 1920**
  - 10.1
- **1921 TO 1945**
  - 7.6
- **1946 TO 1970**
  - 7.1
- **1971 TO 1979**
  - 9.1

#### FUEL COMBINATIONS USED
- **ONE FUEL USED**
  - 16.1
- **TWO FUELS USED**
  - 6.9
- **THREE FUELS USED**
  - 3.2
- **MORE THAN THREE FUELS USED**
  - 1.1

#### ENERGY SOURCES SUPPLIED TO THE BUILDINGS
- **ELECTRICITY**
  - 5.5
- **NATURAL GAS**
  - 7.7
- **FUEL OIL/KEROSENE**
  - 10.3
- **LIQUID PETROLEUM GAS**
  - 13.9
- **COAL**
  - 22.3
- **STEAM**
  - 20.6
- **OTHER**
  - 25.2

---

**Nonresidential Buildings Energy Consumption Survey:**
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
### Appendix C (Continued)

#### Table C5. (Continued)

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#### PERCENT OF BUILDING HEATED

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Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures Steam, Fuel Oil, LPG, and All Fuels Energy Information Administration
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Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
### Table C5. (Continued)

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| WEATHERSTRIPPING OR CAULKING, AND INSULATION ADDED |       |      |      |      |       |      |      |      |
| YES                      | 6.4   | 0.0  | 10.4 | 11.1 | 12.9 | 21.0 | 29.8 | 9.3   |
| NO                       | 5.9   | 6.8  | 10.4 | 8.4  | 10.7 | 18.6 | 13.8 | 6.8   |
| DON'T KNOW/NOT REPORTED | 9.4   | 15.1 | 21.7 | 28.4 | 22.9 | Q    | Q    | 11.4  |

| REDUCED HEATING |       |      |      |      |       |      |      |      |
| YES                      | 5.7   | 7.0  | 10.5 | 7.9  | 9.9  | 13.3 | 15.6 | 6.5   |
| NO                       | 7.6   | 10.2 | 13.1 | 18.4 | 17.1 | Q    | 26.1 | 9.7   |
| NOT REPORTED/ NOT APPLICABLE | 15.2 | 17.5 | 32.2 | 19.4 | 36.2 | 47.7 | Q    | 17.8  |

| REDUCED COOLING |       |      |      |      |       |      |      |      |
| YES                      | 7.0   | 6.8  | 8.6  | 6.9  | 15.3 | 19.6 | 15.8 | 7.8   |
| NO                       | 13.1  | 16.2 | 22.4 | 15.7 | 24.9 | Q    | 43.3 | 28.3  |
| NOT REPORTED/ NOT APPLICABLE | 6.9  | 10.7 | 19.3 | 9.7  | 9.9  | 15.5 | 27.8 | Q    |

| REDUCED HEATING OR REDUCED COOLING |       |      |      |      |       |      |      |      |
| YES                      | 5.7   | 6.6  | 9.9  | 7.5  | 9.3  | 13.0 | 15.7 | 6.2   |
| NO                       | 6.6   | 15.0 | 16.7 | 15.4 | 29.3 | Q    | 32.0 | 12.7  |
| NOT REPORTED/ NOT APPLICABLE | 15.5 | 26.2 | 40.6 | 29.7 | Q    | Q    | 24.5 | 25.7  |

**Note:** A "-" = NOT APPLICABLE, Q = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. DATA MAY NOT SUM TO TOTALS DUE TO MULTIPLE ENERGY SOURCES. SEE GLOSSARY FOR DEFINITIONS OF TERMS USED IN THIS TABLE. SEE APPENDIX B FOR DISCUSSION OF LIMITATIONS OF DATA.


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Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures Steam, Fuel Oil, LPG, and All Fuels

Energy Information Administration
### Appendix C (Continued)

#### Table C6. Fuel Oil and Kerosene Consumption and Expenditures for Commercial Buildings That Use Fuel Oil or Kerosene or Both, 1979—Relative Standard Errors (Percent)

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**HEATING AND COOLING**

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**BUILDING TYPE**

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**TOTAL SQUARE FOOTAGE**

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SEE NOTES AT END OF TABLE

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
### Table C6. (Continued)

| BUILDING CHARACTERISTICS | - | TOTAL | AVERAGE | - | TOTAL | AVERAGE | - | TOTAL | AVERAGE | - | TOTAL | AVERAGE | - | TOTAL | AVERAGE | - | TOTAL | AVERAGE | - | TOTAL | AVERAGE | - | TOTAL | AVERAGE | - | TOTAL | AVERAGE | - | TOTAL | AVERAGE |
|--------------------------|---|-------|---------|---|-------|---------|---|-------|---------|---|-------|---------|---|-------|---------|---|-------|---------|---|-------|---------|---|-------|---------|---|-------|---------|
|                         | - | TOTAL | SQUARE  | FEET | AVERAGE | BUILDINGS | THOUSANDS | TOTAL | SQUARE  | FEET | COMSUMED | TOTAL | MILLION (MILLION) | BUILDINGS | THOUSANDS |
|                         | - | AMOUNT | PER | CONSUMED | (THOUSANDS) | SQUARE | FEET | BTU | AMOUNT | PER | BTU | AMOUNT | PER | BTU | AMOUNT | PER | BTU | AMOUNT | PER | BTU | AMOUNT | PER | BTU | AMOUNT |
| NUMBER OF FLOORS        |   |        |       |       |         |        |       |       |         |       |          |        |          |         |       |       |         |       |          |         |       |       |         |       |
| ONE FLOOR               | 24.1 | 21.5 | 19.8 | 29.3 | 29.3 | 23.5 | 15.9 | 17.4 | 26.3 | 21.0 | 2.9
| TWO FLOORS              | 24.1 | 21.5 | 19.8 | 29.3 | 29.3 | 23.5 | 15.9 | 17.4 | 26.3 | 21.0 | 2.9
| THREE FLOORS            | 17.9 | 13.2 | 12.9 | 13.3 | 13.3 | 14.3 | 17.3 | 13.3 | 27.4 | 3.7
| MORE THAN THREE         | 39.0 | 35.3 | 32.1 | 12.9 | 12.3 | 12.3 | 19.9 | 12.6 | 26.6 | 3.3
| YEAR CONSTRUCTED        |   |        |       |       |         |        |       |       |         |       |          |        |          |         |       |       |         |       |          |         |       |       |         |       |
| 1961 OR BEFORE          | 24.1 | 21.5 | 19.8 | 29.3 | 29.3 | 23.5 | 15.9 | 17.4 | 26.3 | 21.0 | 2.9
| 1951 TO 1960            | 24.1 | 21.5 | 19.8 | 29.3 | 29.3 | 23.5 | 15.9 | 17.4 | 26.3 | 21.0 | 2.9
| 1941 TO 1960            | 18.5 | 16.5 | 14.8 | 10.4 | 10.5 | 12.9 | 16.4 | 14.3 | 14.3 | 11.4 | 84.5 | 8.8 | 8.2 | 19.3 | 13.3 | 12.0 | 12.0 | 12.0 | 12.0 |
| 1971 TO 1979            | 22.1 | 15.7 | 29.6 | 25.5 | 24.1 | 13.1 | 20.6 | 22.6 | 22.6 | 22.6 |
| FUEL COMBINATIONS USED  |   |        |       |       |         |        |       |       |         |       |          |        |          |         |       |       |         |       |          |         |       |       |         |       |
| ONE FUEL USED           | 84.5 | 67.6 | 48.3 | Q     | Q     | Q     | Q     | Q     | Q     | Q     |
| TWO FUELS USED          | 12.4 | 13.3 | 2.1 | 13.2 | 13.2 | 11.1 | 10.1 | 11.5 | 11.5 | 11.5 |
| THREE FUELS USED        | 84.5 | 67.6 | 48.3 | Q     | Q     | Q     | Q     | Q     | Q     | Q     |
| FOUR OR MORE FUELS USED | 12.4 | 13.3 | 2.1 | 13.2 | 13.2 | 11.1 | 10.1 | 11.5 | 11.5 | 11.5 |
| ENERGY SOURCES SUPPLIED TO THE BUILDING |   |        |       |       |         |        |       |       |         |       |          |        |          |         |       |       |         |       |          |         |       |       |         |       |
| ELECTRICITY             | 10.4 | 8.8 | 5.7 | 9.0 | 9.0 | 8.4 | 7.3 | 9.0 | 9.0 | 9.0 |
| NATURAL GAS             | 11.0 | 9.3 | 8.2 | 11.7 | 11.8 | 12.3 | 10.5 | 13.7 | 11.5 | 11.5 |
| LIQUID PETROLEUM GAS    | 29.7 | 16.2 | 19.3 | 11.5 | 11.9 | 13.7 | 23.2 | 14.5 | 16.0 | 4.4 |
| WOOD                     | 30.5 | 35.0 | Q     | 31.8 | 32.4 | 20.4 | 41.4 | Q     | 33.9 | 29.4 |
| OTHER                    | 23.2 | 17.0 | 24.0 | Q     | Q     | Q     | Q     | Q     | Q     | Q     |

See notes at end of table.

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
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</table>

| PERCENT OF BUILDING COOLED |        |         |
| 1 TO 25                   | 26.6  | 24.2    |
| 26 TO 50                  | 17.6  | 17.5    |
| 51 TO 75                  | 15.4  | 20.8    |
| 76 TO 99                  | 39.0  | 22.0    |
| 100+                      | 9.3   | 8.8     |
| NON-HEATED                | 77.6  | 44.9    |

### Heating System

<table>
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<tr>
<th>SELF-CONTAINED UNITS</th>
<th>FORCED-AIR</th>
<th>RADIANT</th>
<th>COMBINATION/OTHER</th>
<th>NON-HEATED</th>
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<td>16.0</td>
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### Air Conditioning System

| WINDOW UNITS | 14.9 |
|              | 26.6 |
| PACKAGE UNITS | 10.3 |
| COMBINATION/OTHER | 15.6 |
| NO AIR CONDITIONING | 15.6 |

### Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures

Steam, Fuel Oil, LPG, and All Fuels

Energy Information Administration
### Table C6. (Continued)

<table>
<thead>
<tr>
<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL BUILDINGS</th>
<th>SQUARE FEET</th>
<th>CONSUMED AMOUNT</th>
<th>CONSUMED PER SQUARE FOOT</th>
<th>CONSUMED PER THOUSAND BTU</th>
<th>EXPENDED AMOUNT</th>
<th>EXPENDED MILLION DOLLARS</th>
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<td>16.1</td>
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<td>13.2</td>
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<td>17.4</td>
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<td>Government-owned and occupied</td>
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See notes at the end of the table.
### Table C6. (Continued)

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<th>TOTAL BUILDINGS</th>
<th>TOTAL FEET (THOUSANDS)</th>
<th>AVERAGE FEET PER BUILDING</th>
<th>TOTAL SQUARE FEET (MILLION)</th>
<th>AVERAGE SQUARE FEET (MILLION)</th>
<th>TOTAL CONSUMED (QUAD- FEET)</th>
<th>AVERAGE CONSUMED (QUAD- FEET)</th>
<th>TOTAL EXPEND. (MILLION BTU)</th>
<th>AVERAGE EXPEND. (MILLION BTU)</th>
<th>TOTAL EXPEND. (MILLION BTU)</th>
<th>AVERAGE EXPEND. (MILLION BTU)</th>
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**NOTE:** A "-" = NOT APPLICABLE. Q = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. DATA MAY NOT SUM TO TOTALS DUE TO Rounding OR MULTIPLE ENERGY SOURCES. SEE GLOSSARY FOR DEFINITIONS OF TERMS USED IN THIS TABLE. SEE APPENDIX B FOR DISCUSSION OF LIMITATIONS OF DATA.

### Table C7. Liquid Petroleum Gas Consumption and Expenditures for Commercial Buildings That Use Liquid Petroleum Gas, 1979—Relative Standard Errors (Percent)

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<th>Total</th>
<th>Average</th>
<th>Average</th>
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<td>20.9</td>
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**See notes at end of table.**
### Table C.7 (Continued)

#### Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration

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<th>AVERAGE AMOUNT CONSUMED (BILLION BTU)</th>
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SEE NOTES AT END OF TABLE
Table C7. (Continued)

| BUILDING CHARACTERISTICS | TOTAL BUILDINGS | AVERAGE BUILDING | TOTAL AMOUNT | AVERAGE AMOUNT | AVERAGE EXPEND. | TOTAL EXPEND. | PER MILLION BUILDING | PER MILLION | PER MILLION BUDDIES | PER MILLION SQUARE FEET | PER MILLION | PER MILLION Employee | PER BILLION BUDG | PER BILLION | PER BILLION | PER BILLION |
|--------------------------|----------------|------------------|--------------|----------------|----------------|---------------|----------------------|-------------|------------------|------------------------|-------------|-------------------|------------------|-------------|-------------|-------------|-------------|
| YEAR CONSTRUCTED         |                |                  |              |                |                |               |                      |             |                  |                        |             |                   |                  |             |             |             |             |
| 1900 OR BEFORE           | 19.6           | 33.0             | 41.4         | 39.5           | 39.0           | 39.0          |                      |             |                  |                        |             |                   |                  |             |             |             |             |
| 1901 TO 1920             | 33.6           | 27.7             | 28.0         | 40.6           | 40.6           | 40.6          |                      |             |                  |                        |             |                   |                  |             |             |             |             |
| 1921 TO 1946             | 17.6           | 32.6             | 37.1         | 31.8           | 31.8           | 31.8          |                      |             |                  |                        |             |                   |                  |             |             |             |             |
| 1946 TO 1960             | 26.8           | 21.9             | 28.0         | 49.6           | 49.6           | 49.6          |                      |             |                  |                        |             |                   |                  |             |             |             |             |
| 1961 TO 1970             | 10.6           | 44.6             | 48.9         | 31.6           | 31.6           | 31.6          |                      |             |                  |                        |             |                   |                  |             |             |             |             |
| 1971 TO 1973             | 18.6           | 29.7             | 38.3         | 19.3           | 19.3           | 19.3          |                      |             |                  |                        |             |                   |                  |             |             |             |             |
| 1974 TO 1979             | 13.2           | 25.0             | 21.9         | 31.8           | 31.8           | 31.8          |                      |             |                  |                        |             |                   |                  |             |             |             |             |

FUEL COMBINATIONS USED

| TWO FUELS USED            | 14.7           | 20.7             | 19.0         | 15.6           | 15.6           | 15.6          |                      |             |                  |                        |             |                   |                  |             |             |             |             |
| THREE FUELS USED          | 21.6           | 16.8             | 17.6         | 34.5           | 34.5           | 34.5          |                      |             |                  |                        |             |                   |                  |             |             |             |             |
| ELECTRICITY, FUEL OIL/KEROSENE, LPG | 29.6           | 16.6             | 20.3         | 48.9           | 48.9           | 48.9          |                      |             |                  |                        |             |                   |                  |             |             |             |             |
| OTHER                      | 27.8           | 35.6             | Q            | 39.5           | 39.5           | 39.5          |                      |             |                  |                        |             |                   |                  |             |             |             |             |
| FOUR OR MORE FUELS USED   | 28.8           | 26.7             | 23.0         | 37.1           | 37.1           | 37.1          |                      |             |                  |                        |             |                   |                  |             |             |             |             |

ENERGY SOURCES SUPPLIED TO THE BUILDING

| ELECTRICITY               | 15.9           | 35.0             | 11.5         | 36.8           | 36.8           | 36.8          |                      |             |                  |                        |             |                   |                  |             |             |             |             |
| NATURAL GAS              | 27.0           | 17.6             | 35.3         | 32.3           | 32.3           | 32.3          |                      |             |                  |                        |             |                   |                  |             |             |             |             |
| LIQUID PETROLEUM GAS     | 29.7           | 16.2             | 19.3         | 33.9           | 33.9           | 33.9          |                      |             |                  |                        |             |                   |                  |             |             |             |             |
| OTHER                     | 10.6           | 36.0             | 41.2         | 33.9           | 33.9           | 33.9          |                      |             |                  |                        |             |                   |                  |             |             |             |             |

HEATING SYSTEM

| SELF-CONTAINED UNITS     |                |                  |              |                |                |                |                      |             |                  |                        |             |                   |                  |             |             |             |             |
| FORCED-AIR              | 21.8           | 33.2             | 40.5         | 28.2           | 28.2           | 28.2          |                      |             |                  |                        |             |                   |                  |             |             |             |             |
| RADIANT                 | 38.3           | 36.4             | Q            | Q              | Q              | Q             |                      |             |                  |                        |             |                   |                  |             |             |             |             |
| COMBINATION/OTHER       | 17.3           | 28.6             | 22.7         | 39.0           | 39.0           | 39.0          |                      |             |                  |                        |             |                   |                  |             |             |             |             |
| CENTRAL SYSTEM           |                |                  |              |                |                |                |                      |             |                  |                        |             |                   |                  |             |             |             |             |
| FORCED-AIR              | 13.7           | 22.5             | 22.0         | 22.3           | 22.3           | 22.3          |                      |             |                  |                        |             |                   |                  |             |             |             |             |
| RADIANT                 | 56.6           | 37.4             | 35.1         | 39.9           | 39.9           | 39.9          |                      |             |                  |                        |             |                   |                  |             |             |             |             |
| COMBINATION/OTHER       | 25.9           | 29.3             | 32.0         | 33.2           | 33.2           | 33.2          |                      |             |                  |                        |             |                   |                  |             |             |             |             |
| NONE                     | 27.3           | 22.1             | 24.0         | 33.1           | 33.1           | 33.1          |                      |             |                  |                        |             |                   |                  |             |             |             |             |

SEE NOTES AT END OF TABLE

Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
### Table C7. (Continued)

#### Building Characteristics

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<th>PERCENT OF BUILDING COOLED</th>
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Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
### Table C7. (Continued)

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**NOTE:** A "-" = NOT APPPLICABLE. Q = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. DATA MAY NOT SUM TO TOTALS DUE TO ROUNDING OR MULTIPLE ENERGY SOURCES. SEE GLOSSARY FOR DEFINITIONS OF TERMS USED IN THIS TABLE. SEE APPENDIX B FOR DISCUSSION OF LIMITATIONS OF DATA.

**SOURCE:** RESIDENTIAL AND COMMERCIAL BRANCH, ENERGY END USE DIVISION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY INFORMATION ADMINISTRATION, THE 1979 NONRESIDENTIAL BUILDINGS ENERGY CONSUMPTION SURVEY.
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See notes at end of Table

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
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Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
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<td>71.1</td>
<td>Q</td>
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<td>Q</td>
<td>Q</td>
<td>Q</td>
<td>Q</td>
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<tr>
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<tr>
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<td>23.4</td>
<td>19.4</td>
<td>17.1</td>
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<td>15.6</td>
<td>16.7</td>
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<tr>
<td>No.</td>
<td>27.4</td>
<td>33.3</td>
<td>18.0</td>
<td>26.1</td>
<td>26.1</td>
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<td>18.0</td>
<td>20.8</td>
<td>30.7</td>
<td>9.8</td>
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<td>68.5</td>
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<td>Q</td>
<td>Q</td>
<td>Q</td>
<td>Q</td>
<td>Q</td>
<td>Q</td>
<td>Q</td>
</tr>
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<td></td>
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<td>43.2</td>
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<td>22.1</td>
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<td>32.2</td>
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<td>REDUCED HEATING OR REDUCED COOLING</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>22.7</td>
<td>19.7</td>
<td>19.5</td>
<td>15.7</td>
<td>15.7</td>
<td>17.4</td>
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<td>16.9</td>
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<tr>
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<td>Q</td>
<td>Q</td>
<td>Q</td>
</tr>
</tbody>
</table>

**Note:** A "-" = Not Applicable, Q = Data withheld because of a large variance, Data may not sum to totals due to rounding or multiple energy sources. See Glossary for definitions of terms used in this table. See Appendix B for discussion of limitations of data.

Table C9. Distribution of Commercial Buildings Supplied with Fuel Oil, by Number of Tanks, Tank Capacity, and Inventory, as of January 1, 1980—Relative Standard Errors (Percent)

<table>
<thead>
<tr>
<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL BUILDINGS [THOUSANDS]</th>
<th>TOTAL TANK CAPACITY IN GALLONS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO TANK</td>
<td>LESS THAN 500</td>
</tr>
<tr>
<td>COMMERCIAL BUILDINGS</td>
<td>10.3</td>
<td>35.6</td>
</tr>
<tr>
<td>NUMBER OF FUEL OIL TANKS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ONE</td>
<td>35.6</td>
<td>35.6</td>
</tr>
<tr>
<td>TWO OR MORE</td>
<td>11.0</td>
<td>-</td>
</tr>
<tr>
<td>INVENTORY</td>
<td>9.9</td>
<td>-</td>
</tr>
<tr>
<td>LESS THAN 500</td>
<td>19.0</td>
<td>35.6</td>
</tr>
<tr>
<td>500 TO 1,999</td>
<td>12.9</td>
<td>-</td>
</tr>
<tr>
<td>2,000 TO 4,999</td>
<td>18.1</td>
<td>-</td>
</tr>
<tr>
<td>5,000 TO 9,999</td>
<td>11.4</td>
<td>-</td>
</tr>
<tr>
<td>10,000 AND OVER</td>
<td>14.5</td>
<td>-</td>
</tr>
</tbody>
</table>

NOTE: A "-" REPRESENTS OR ROUNDS TO ZERO. Q = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. DATA MAY NOT SUM TO TOTALS DUE TO ROUNDING OR MULTIPLE ENERGY SOURCES. SEE GLOSSARY FOR DEFINITIONS OF TERMS USED IN THIS TABLE. SEE APPENDIX B FOR DISCUSSION OF LIMITATIONS OF DATA.

SOURCE: RESIDENTIAL AND COMMERCIAL BRANCH, ENERGY END USE DIVISION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY INFORMATION ADMINISTRATION, THE 1979 NONRESIDENTIAL BUILDINGS ENERGY CONSUMPTION SURVEY.
### Table C10. Total Fuel Oil Tank Capacity and Inventory by Number of Tanks, as of January 1, 1980—Relative Standard Errors (Percent)

<table>
<thead>
<tr>
<th>BUILDING CHARACTERISTICS</th>
<th>TOTAL</th>
<th>NUMBER OF FUEL OIL TANKS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ONE</td>
<td>TWO OR MORE</td>
</tr>
<tr>
<td></td>
<td>TOTAL TANK CAPACITY</td>
<td>TOTAL INVENTORY</td>
</tr>
<tr>
<td></td>
<td>TOTAL TANK CAPACITY</td>
<td>TOTAL INVENTORY</td>
</tr>
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<td>TOTAL INVENTORY</td>
</tr>
<tr>
<td></td>
<td>TOTAL INVENTORY</td>
<td>TOTAL INVENTORY</td>
</tr>
<tr>
<td>COMMERCIAL BUILDINGS</td>
<td>10.3</td>
<td>9.9</td>
</tr>
<tr>
<td>TOTAL TANK CAPACITY IN GALLONS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LESS THAN 500</td>
<td>13.3</td>
<td>13.4</td>
</tr>
<tr>
<td>500 TO 1,999</td>
<td>11.0</td>
<td>10.9</td>
</tr>
<tr>
<td>2,000 TO 4,999</td>
<td>21.1</td>
<td>20.5</td>
</tr>
<tr>
<td>5,000 TO 9,999</td>
<td>16.0</td>
<td>16.3</td>
</tr>
<tr>
<td>10,000 AND OVER</td>
<td>11.7</td>
<td>14.4</td>
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<tr>
<td>INVENTORY</td>
<td></td>
<td></td>
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<tr>
<td>NONE</td>
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<tr>
<td>LESS THAN 500</td>
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<tr>
<td>500 TO 1,999</td>
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<td>2,000 TO 4,999</td>
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<tr>
<td>5,000 TO 9,999</td>
<td>31.4</td>
<td>33.7</td>
</tr>
<tr>
<td>10,000 AND OVER</td>
<td>14.5</td>
<td>17.9</td>
</tr>
</tbody>
</table>

NOTE: A "-" = NOT APPLICABLE. Q = DATA WITHHELD BECAUSE OF A LARGE VARIANCE. DATA MAY NOT SUM TO TOTALS DUE TO ROUNDING OR MULTIPLE ENERGY SOURCES. SEE GLOSSARY FOR DEFINITIONS OF TERMS USED IN THIS TABLE. SEE APPENDIX B FOR DISCUSSION OF LIMITATIONS OF DATA.

SOURCE: RESIDENTIAL AND COMMERCIAL BRANCH, ENERGY END USE DIVISION, OFFICE OF ENERGY MARKETS AND END USE, ENERGY INFORMATION ADMINISTRATION, THE 1979 NONRESIDENTIAL BUILDINGS ENERGY CONSUMPTION SURVEY.
Hello, I'm __________________ from Westat, Inc., a private research firm.
We are conducting a study for the Department of Energy about energy consumption in non-residential buildings. May I speak with the building manager or a person knowledgeable about the types of energy coming into the building. May I have his or her name, title and where I might locate that person.

NAME: _______________________
TITLE: _______________________
LOCATION: ___________________ Phone (_____) _______________________

Hello, I'm __________________ from Westat, Inc., a social science research organization. We are conducting a study for the Department of Energy about energy consumption in non-residential buildings. (HAND LETTER.) Although your participation in this survey is voluntary, we do hope you will cooperate and participate in this important study of energy use.

IF ASKED ABOUT CONFIDENTIALITY, READ:

Any information we collect which will permit identification of respondents or their buildings will be confidential and used only for statistical purposes. Data that can be identified with individual respondents will not be disclosed or released to anyone (including the Department of Energy) for any other purpose, except as required by law.

Interviewer Name ______________________ ID No. ______________________
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
Appendix D (Continued)

First of all I need to be able to distinguish, or separate, one building from another.

1. Is the building at [MENTION ADDRESS(ES)], and the building at [MENTION ADDRESS(ES)] owned by the same person or persons?
   
   YES ........................1
   
   NO ........................2
   
   or
   
   DON’T KNOW ..............8
   
   DEFINITION: CONSIDER EACH SEPARATELY OWNED BUILDING AS A SEPARATE BUILDING.
   
   IF THE BUILDING IDENTIFIED ON THE LABEL TURNS OUT TO BE TWO OR MORE SEPARATE BUILDINGS AS DEFINED ABOVE, OBTAIN AN INTERVIEW FOR EACH BUILDING.
   
   GO TO BOX 2

2. Are there permanent walls that extend from the ground level to the top story of the building, at [MENTION ADDRESS(ES)], which totally separate it from the building at [MENTION ADDRESS(ES)]?
   
   YES ........................1
   
   NO ........................2
   
   DEFINITION: CONSIDER EACH BUILDING SEPARATED BY A PERMANENT WALL AS A SEPARATE BUILDING.
   
   IF THE BUILDING IDENTIFIED ON THE LABEL TURNS OUT TO BE TWO OR MORE SEPARATE BUILDINGS AS DEFINED ABOVE, OBTAIN AN INTERVIEW FOR EACH BUILDING.
   
   CONSIDER CONNECTED BUILDINGS AS ONE BUILDING.
   
   OBTAIN INTERVIEW AND INCLUDE ALL PARTS THAT ARE TO BE CONSIDERED AS "ONE" BUILDING.
   
   GO TO BOX 2

BOX 1

BASED UPON YOUR OBSERVATION, CHECK ONE BOX AND FOLLOW INSTRUCTION:

☐ IF BUILDING IS FREE-STANDING, IS A SHOPPING CENTER/MALL, OR IS SAMPLED FROM SPECIAL BUILDING LIST, SKIP TO THE TOP OF PAGE 2.

☐ IF BUILDING IS ATTACHED ON ANY SIDE TO ANOTHER BUILDING, CONTINUE.

BOX 2

ORIGINAL LISTING IS:

☐ CORRECT  ☐ INCORRECT
Appendix D (Continued)

The questions I will be asking you will all be about this building. I am referring to the structure(s) at [USE NUMBER(S) OR NAME]/the entire shopping center or mall at [USE NUMBER(S) OR NAME].

3. (IF NAME OF BUILDING IS NOT KNOWN, ASK): What is the correct name and address of this building? (IF KNOWN, SAY): Is the correct name and address of the building: [MENTION NAME AND ADDRESS]? (IF BUILDING HAS NO NAME, ASK, OR VERIFY, NAME OF MAJOR ESTABLISHMENT THAT OCCUPIES BUILDING)

   [CHECK ONE]
   
   [ ] Name of Building
   [ ] Name of Major Establishment in Building

4. What is the phone number of the building (establishment)?

   [ ] Area Code

5. What is the building’s Zip Code?

   [ ] Zip Code

   BOX 3  IF AREA LISTING: CHECK TO SEE IF YOUR ASSIGNED ZIP CODE AGREES WITH THE BUILDING’S ZIP (CHECK ONE BOX)
   [ ] AGREES - CONTINUE WITH INTERVIEW
   [ ] DOES NOT AGREE - CHECK THAT YOU ARE AT THE CORRECT ADDRESS AND WITHIN THE SEGMENT BOUNDARIES. IF SO, CONTINUE WITH INTERVIEW.

   IF SPECIAL BUILDING LIST, CHECK THAT YOU ARE AT CORRECT ADDRESS AND CONTINUE WITH INTERVIEW.

6. Is the building occupied by one, or more than one, organization, company or agency?

   One........................................1 (Q11)
   More than one..........................2 (Q7)

7. Is there any establishment in this building that receives its mail through any other Zip Code?

   Yes.........................................1 (Q8)
   No............................................2 (Q11)
   Don’t know................................8 (Q11)

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Appendix D (Continued)

8. Does the establishment that has a different ZIP code occupy 75% or more of the space in this building?
   
   Yes. ....................................... 1 (Q9)
   No. ....................................... 2 (Q11)
   Don't know. ................................ 6 (Q11)

9. What is the name of that establishment?
   ______________________________________
   (Name)

10. What is the ZIP Code for the establishment?
   ______________________________________
   (ZIP Code)

11. Is any part of the building occupied by any of the following categories?

   
   YES  |  NO  |  O  | 2  | 0  | 1
   A Federal Government Agency........... 1 | 2 | 6 | 1 | 2 |
   A State Government Agency............. 1 | 2 | 6 | 1 | 2 |
   A Local Government Agency............. 1 | 2 | 6 | 1 | 2 |

   * If YES is answered for any part of Q11, ask Q12. 
   * Otherwise, skip to Q13.

12. Is the building owned by an agency of the Federal, State or local government?
   
   Yes. ....................................... 1 (Q14)
   No. ....................................... 2 (Q13)
   Don't know. ................................ 6 (Q13)

13. Is the building owner or his agent an occupant of this building?
   
   Yes. ....................................... 1
   No. ....................................... 2

   IF YOU KNOW THE NAME, ADDRESS, TELEPHONE NUMBER, AND ZIP CODE OF
   THE MANAGEMENT OFFICE RECORD THE INFORMATION IN Q14 AND Q15, AND
   THEN SKIP TO Q18, OTHERWISE CONTINUE.

14. Is there a management office that supervises the building?
   
   Yes. ....................................... 1 (Q13)
   No. ....................................... 2 (Q16)
   Don't know. ................................ 6 (Q16)
Appendix D (Continued)

15. (What is/let me verify) the name, address, ZIP code, and phone number of the management office?
   Name:...........................................................................
   Address:...........................................................................
   ZIP Code:...........................................................................
   Telephone: ...........................................................................

16. I would now like to ask you some questions about the physical characteristics of the building. When was the major or largest portion of the building constructed?

   Year:...........................................................................
   Don't know............................................ 998 (Q17)

17. Here is a card which has several categories of years. Which category in your estimation best applies to the year the largest portion of the building was constructed?

   [HAND CARD]
   1. Before 1900 ............................................. 01
   2. 1901-1925 ............................................. 02
   3. 1926-1945 ............................................. 03
   4. 1946-1960 ............................................. 04
   5. 1961-1970 ............................................. 05
   6. 1971-1973 ............................................. 06
   7. 1974 to present ..................................... 07
   8. Don't know ............................................. 98

18. (If building built before 1974, ask): In the last five years has any weather stripping or caulking been added to the building shell?
   (If building built 1974 to present, ask): Since the building was constructed, has any weather stripping or caulking been added to the building shell?

   Yes.......................................................... 1 (Q19)
   No.......................................................... 2 (Q20)
   Don't know............................................ 998 (Q21)

19. In what year was it last added?

   Year:...........................................................................
   Don't know............................................ 998

20. Has any additional insulation been installed in the roof or walls since the building was constructed?

   Yes.......................................................... 1 (Q21)
   No.......................................................... 2 (Q22)
   Don't know............................................ 998 (Q23)

21. In what year was the insulation last added?

   Year:...........................................................................
   Don't know............................................ 998

   □-□ blank

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### Appendix D (Continued)

#### Question 22
Thinking of the amount of glass on the exterior surface of the building, would you estimate that glass covers 50% or more of the exterior surface of this building?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
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</table>

Is it 75% or more?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Is any of the exterior glass considered to be tinted, reflective, insulated, or the thermal pane type of glass?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Q24)</td>
<td>2 (Q26)</td>
<td>8 (Q26)</td>
</tr>
</tbody>
</table>

#### Question 23
Was the tinted, reflective, insulated or thermal pane type of glass installed at the time of construction or added since the building was constructed?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Q26)</td>
<td>2 (Q25)</td>
<td>8 (Q26)</td>
</tr>
</tbody>
</table>

#### Question 24
In approximately what year was the tinted, reflective, insulated, or thermal pane glass most recently installed?

<table>
<thead>
<tr>
<th>Year</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979</td>
<td>989</td>
</tr>
</tbody>
</table>

#### Question 25
Are there any window awnings or other window-shadings on the outside of the building?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Q27a)</td>
<td>2 (Q28)</td>
<td>8 (Q28)</td>
</tr>
</tbody>
</table>

#### Question 26
Were these window awnings or other shadings installed at the time of construction or added since that time?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Q28)</td>
<td>2 (Q27b)</td>
<td>8 (Q27b)</td>
</tr>
</tbody>
</table>

#### Question 27
In approximately what year were these window awnings or shadings most recently installed?

<table>
<thead>
<tr>
<th>Year</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979</td>
<td>989</td>
</tr>
</tbody>
</table>

#### Question 28
Are there any window shadings on the inside of the building such as shades, drapes, or venetian blinds?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>8</td>
</tr>
</tbody>
</table>

---

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29. How many floors are in the tallest section of the building? Please include any floors that may be used as a parking garage, basements, or any other floors below ground level.

   
   
   
   

30. What is the total square footage of all the space enclosed within the exterior walls of this building? Again, please include indoor parking facilities and basements, and all space such as hallways, lobbies, stairways and elevator shafts.

   
   
   
   

31. Here is a card that shows several space categories of total square feet. Which category in your estimate best applies to the total square feet in this building?

   
   
   
   

   1,000 or less........................................ 1
   1,001 to 7,500 sq. ft.............................. 2
   7,501 to 16,000 sq. ft............................ 3
   16,001 to 25,000 sq. ft......................... 4
   25,001 to 50,000 sq. ft......................... 5
   50,001 to 100,000 sq. ft....................... 6
   100,001 to 200,000 sq. ft..................... 7
   200,001 to 500,000 sq. ft................... 8
   500,001 to 1 million sq. ft................9
   Over 1 million sq. ft....................... 10
   Don't know..................................... 98

   The purpose of the next two questions is to find out about the kinds of activities that occur within this building.

   "Activities" we mean the building's purpose. What is it used for? For example, space in a building may be used for office work, retail sales, residential living quarters, for manufacturing, warehousing, laboratory, classroom activities, or any number of other purposes.

32. First of all, is any part of this building used for residential purposes? By residential we mean individual housekeeping units with kitchen facilities.

   
   
   
   
   Yes............................................. 1 (Q33)
   No.............................................. 2 (BOX 5)

33. Approximately what percentage of the square footage in the building is used for residential purposes?

   
   
   
   

   \( x \) (BOX 5)

   Don't know...................................... 99% (Q34)

   

   

   

   

   BOX 5

   CIRCLE CODE AND FOLLOW SKIP INSTRUCTION:

   254 or OVER........................................ 1 (Q39)
   NONE OR LESS THAN 25% RESIDENTIAL........... 2 (BOX 6)

---

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34. Would you estimate that 50% or more of the square feet in this building is used for residential purposes?
   Yes........ 1
   No........ 2

Is it 75% or more?
Yes........ 1 (Q39)
No........ 2 (Q39)

35. Considering all of the square feet in this building, would you estimate that over 75% of this space is used as offices for establishments or professionals?
   Yes........ 1 (Q41)
   No........ 2 (Q41)

36. Would you classify this building/complex of stores as being a shopping center or mall?
   Yes........ 1 (Q41)
   No........ 2 (Q41)

37. Considering all of the square feet in this building, is there one main activity that occupies over 75% of the space?
   Yes........ 1 (Q49)
   No........ 2 (Q49)

38. Could you describe that activity? A general description such as office work, laundry, restaurant, manufacturing, etc., is what I need.


Nonresidential Buildings Energy Consumption Survey:
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Appendix D (Continued)

39. Could you describe all the activities that occur within this building (other than residence)? A general description such as office work, laundry, restaurant, manufacturing, etc., is what I need.

ACTIVITIES

40. You have named the following activities (READ ACTIVITIES MENTIONED IN Q39.)
A. Which of these activities occupies most space in this building?

ACTIVITY:

B. About what percentage of the square feet in this building is used for (activity mentioned in A)?

C. Which activity occupies the next most space in this building?

ACTIVITY:

D. About what percentage of the square feet in this building is used for (activity mentioned in C)?

41. My next few questions are about the establishments in this building. Approximately, how many people work in all of the establishments that occupy the establishment that occupies this building? (If number varies throughout the year, ask for what occurs most of the year.)

NUMBER OF RANGE

Don't know or won't estimate.... 99999 (4)

42. Here is a card which shows categories. Which category in your estimation best applies to the number of people who work in the building?

CARD

CLAS

1

3

LESS THAN 10.

10-19.

20-49.

50-99.

100-249.

250-499.

500-999.

1,000-2,499.

2,500-4,999.

5,000 or more.

Don't know.

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Energy Information Administration
43. I would now like to ask you about the hours the building is "in operation." By "in operation" we mean the total hours people normally work in the building. For this building, what are the total number of hours each day that (the establishment [largest of the establishments are] "in operation"? Let's start with:

(READ EACH DAY)

<table>
<thead>
<tr>
<th>SCHEDULE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HOURLY REQUIREMENTS</strong></td>
</tr>
<tr>
<td>To enter: 14 hrs. Not operated: -</td>
</tr>
<tr>
<td><strong>DAY</strong></td>
</tr>
<tr>
<td>MONDAY</td>
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<tr>
<td>TUESDAY</td>
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<tr>
<td>WEDNESDAY</td>
</tr>
<tr>
<td>THURSDAY</td>
</tr>
<tr>
<td>FRIDAY</td>
</tr>
<tr>
<td>SATURDAY</td>
</tr>
<tr>
<td>SUNDAY</td>
</tr>
</tbody>
</table>

44. Are the hours you just mentioned the same throughout the year?

- Yes................................. [44]
- No.................................. [45]
- Don't know........................ [46]

[44] = Blank
45. During what months are the hours of operation changed, and what are the hours at those times?

<table>
<thead>
<tr>
<th>Days</th>
<th>HOURS FOR MOST ESTABLISHMENT(s)</th>
<th>Months</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(h) Oper.</td>
<td>24 hrs.</td>
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<tr>
<td>Monday</td>
<td></td>
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<td>Tuesday</td>
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<td></td>
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<td>Wednesday</td>
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<td>Saturday</td>
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<tr>
<td>Sunday</td>
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</tbody>
</table>

46a. My next few questions are about the heating and cooling systems that serve the building. Approximately what percentage of the [Mention Square Feet from Q24 or Q21] square feet in this building is heated?

[Blank space for answer]%

*IF ZERO PERCENT IS HEATED, SKIP TO Q53; OTHERWISE CONTINUE.*
Appendix D (Continued)

46b. The process of heating a building may be thought of in two parts: one, the system used to convert energy into heat, and two, the system that is used to distribute the heat throughout the building. First of all, just think of the system, or systems, that convert energy into heat; then look at this card, and pick the ONE choice that most nearly describes the energy conversion system for this building.

a. Self-contained units that may be installed either in the building or on the roof. These units both generate and deliver the heat to the area each unit serves.

b. A central system (furnace or boiler(s)) which is located within the building. This system generates the heat, but depends on an additional system for distribution of the heat.

c. A central system located outside of the building. This system converts energy to a heating substance (water or steam) which is then delivered to the building. The heated substance (water or steam) is then distributed through another system to specific areas within the building.

d. Something else or a combination of the above. (PLEASE SPECIFY)

46c. Here is a second card. This card shows various heat distribution systems. Which distribution system on this card most nearly describes the heat distribution system in use in this building?

I. Forced hot air (with fans) using:

a. Air handling unit with self-contained fan(s) which distribute heat to only part of the building.

b. Single central air handling unit separate from the energy conversion system, which distributes air throughout the building through ducts.

II. Forced or naturally circulated air using:

c. Electric baseboards.

d. Baseboard heating using hot water.

e. Baseboard heating using steam.

f. Radiators or convectors.

g. Heating panels in the walls or floor.

h. Something else (PLEASE SPECIFY)
Appendix D (Continued)

IF BUILDING: (CIRCLE CODE AND FOLLOW INSTRUCTION;

- HAS ANY RESIDENTIAL UNITS........................................ 1 (Q47) [ ]
- IS TOTALLY NON-RESIDENTIAL...................... 2 (Q50)

47. Do the residential occupants have control over the heating system; that is, are they able to turn the heat on or off or to set the temperature in their area?
   
   Yes.........................................................1 (Q50)
   No....................................................2 (Q46)

48a. During normal daytime hours, what interior temperature will you try to maintain in the residential part of this building when the heating system is operating this (coming) winter?
   
   (Interior Temperature)...........................................
   Don't know.................................998

48b. As far as you know, what interior temperature was maintained in the residential part of the building last winter?
   
   (Interior Temperature)...........................................
   Don't know.................................998

49. As part of the building's standard operating procedure for the residential portion of this building, is there a manual or an automatic reduction in the heat produced by the heating system at night?
   
   Yes.........................................................1 (Q52)
   No....................................................2

50. Do employees of the establishment/establishments in the building have control over the heating system; that is, are they able to turn the heat on or off or to set the temperature in their area?
   
   Yes.........................................................1 (Q52)
   No....................................................2 (Q52a)

51a. During normal working hours for this building, what interior temperature will you try to maintain when the heating system is operating this (coming) winter?
   
   (Interior Temperature)...........................................
   Don't know.................................998

51b. As far as you know, what interior temperature was maintained last winter?
   
   (Interior Temperature)...........................................
   Don't know.................................998

Nonresidential Buildings Energy Consumption Survey:
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Appendix D (Continued)

52. As part of the building's standard operating procedure, is there a manual or an automatic reduction in the heat produced by the heating system during the hours when the building is not in full use?
   Yes. ................................. 1
   No. ................................. 2

53. Now thinking of the cooling system or systems that serve the building. Approximately, what percentage of the REPR SEw SQUARE FEET OF Q30 OR SQUARE FEET IN THIS BUILDING is air conditioned for cooling purposes?

   Air Conditioned
   ___________________
   __________
   _
   __________

   IF "ZERO" PERCENT IS AIR CONDITIONED SKIP TO Q61.
   OTHERWISE CONTINUE.

54. What kind of cooling system or systems supply the air conditioning for this building? Please look at this card and pick the ONE choice that most nearly describes the air conditioning system here:
   a. Window units only................... 1 (Q61)
   b. One or more packaged units (i.e., built and assembled at a factory and installed as a unit at the building which cool all, or portions, of this building)............................... 2 (BOX 7)
   c. A single central system which serves all areas of the building that are air-conditioned and which was specially constructed for this building..................... 3 (BOX 7)
   d. Something else or any combination of the above (SPECIFY)

   BOX 7
   IF BUILDING: (CIRCLE CODE AND FOLLOW INSTRUCTION)
   • HAS ANY RESIDENTIAL UNITS................................. 1 (Q55)
   • IS TOTALLY NON-RESIDENTIAL............................. 2 (Q56)

55. Do the residential occupants have control over the central or packaged unit air conditioning system; that is, are they able to turn the air conditioning on or off or to set the temperature in their area?
   Yes. ................................. 1 (Q38)
   No. ................................. 2 (Q39)
56a. During normal daytime hours, what interior temperature did you try to maintain in the residential part of this building this past summer?

[Interior Temperature]  
Don't know: 998

56b. As far as you know, what interior temperature did you try to maintain in the residential part of the building the summer before; that is, the summer of 1978?

[Interior Temperature]  
Don't know: 998

57. As part of the building’s standard operating procedure for the residential portion of this building, is there a manual or an automatic reduction in the cooling produced by the air conditioning system at night?

Yes: [ ]  
No: [ ]

58. Do employees of (the establishment/the establishments) in the building have control over the central or package unit air conditioning system; that is, are they able to turn the air conditioning on or off or to set the temperature in their area?

Yes: [ ]  
No: [ ]

59a. During normal working hours for this building, what interior temperature did you try to maintain this past summer?

[Interior Temperature]
Don't know: 998

59b. As far as you know, what interior temperature did you try to maintain the summer before; that is, the summer of 1978?

[Interior Temperature]
Don't know: 998

60. As part of the building’s standard operating procedure, is there a manual or an automatic reduction in the cooling produced by the air conditioning system during the hours when the building is not in full use?

Yes: [ ]  
No: [ ]

61. Has any of the space in the building which is normally in use been vacant or unoccupied for at least 3 months in the past 12 months?

Yes: [ ]  
No: [ ]

62. Approximately, what percentage of the (MENTION SQUARE FEET FROM Q30 and Q31) square feet in the building would you estimate has been vacant or unoccupied for at least 3 months during the past 12 months?

% Unoccupied
Don't know: 998

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
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Energy Information Administration
During that time, was there a reduction in the amount of heat and/or cooling supplied to the vacant or unoccupied area?

Yes.................................................. 1
No.................................................. 2

The next few questions concern the actual equipment that supplied heating (and air conditioning) to the building. Is there a regular maintenance program for the heating (and air conditioning) system that is, is the equipment checked at least once a year even if there are no apparent problems?

Yes.................................................. 1
No.................................................. 2
Don't know........................................ 3

Are there any features that are part of the building's heating or cooling system which are specifically designed to help conserve energy?

Yes.................................................. 1
No.................................................. 2
Don't know........................................ 3

Could you describe those features?

<table>
<thead>
<tr>
<th>COLUMN A</th>
<th>COLUMN B</th>
<th>COLUMN C</th>
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</thead>
<tbody>
<tr>
<td>SPECIFY FEATURE(S) BELOW</td>
<td>READ: In what year was it installed?</td>
<td>IF &quot;1977&quot; READ: What month in 1977 was it installed?</td>
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<tr>
<th>COLUMN A</th>
<th>COLUMN B</th>
<th>COLUMN C</th>
</tr>
</thead>
<tbody>
<tr>
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<td>READ: In what year was it installed?</td>
<td>IF &quot;1977&quot; READ: What month in 1977 was it installed?</td>
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<tr>
<th>COLUMN A</th>
<th>COLUMN B</th>
<th>COLUMN C</th>
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</thead>
<tbody>
<tr>
<td>SPECIFY FEATURE(S) BELOW</td>
<td>READ: In what year was it installed?</td>
<td>IF &quot;1977&quot; READ: What month in 1977 was it installed?</td>
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</tbody>
</table>
### Appendix D (Continued)

**69.** Here is a card which lists various types of fuels or energy sources. Which of these fuels or energy sources are brought into this building?

**HANG CARD**

<table>
<thead>
<tr>
<th>RECORD ENERGY SOURCES IN COLUMN HEADINGS ON TOP OF FACING PAGE. IF ADDITIONAL COLUMNS ARE NEEDED TO RECORD ENERGY SOURCES, USE INITIATION BOOKLET.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IF FUEL OIL MENTIONED, ASK Q69a; OTHERWISE SKIP TO Q70.</td>
</tr>
</tbody>
</table>

**69a.** In how many tanks is the fuel oil stored?

<table>
<thead>
<tr>
<th>Tank #1</th>
<th>Q69b. How many gallons of fuel oil does (the/each) tank hold?</th>
<th>Q69c. At the present time, approximately how many gallons of fuel oil are in (the/each) tank?</th>
<th>Q69d. Would you estimate the tank to be (AGAC CATEGORIES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 gal.</td>
<td>Don’t know…..999998</td>
<td>gal. (Tank 2 or Q70)</td>
<td>Completely full….1</td>
</tr>
<tr>
<td>Don’t know…..999998</td>
<td>1/2 full….2</td>
<td>Empty….3</td>
<td></td>
</tr>
<tr>
<td>Don’t know…..999998</td>
<td>1/4 full….4</td>
<td>Don’t know….5</td>
<td></td>
</tr>
<tr>
<td>Don’t know…..999998</td>
<td>Empty….6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**FROM YOUR OBSERVATION**

1. Actual…1
2. Estimated….2

**Tank #2**

| Don’t know…..999998 | Don’t know…..999998 | Don’t know…..999998 | Don’t know…..999998 |
| 1/2 full….2 | 1/4 full….3 | Empty….4 | Don’t know….5 |
| Don’t know…..999998 | Don’t know…..999998 | Don’t know…..999998 | Don’t know…..999998 |
| Don’t know…..999998 | Don’t know…..999998 | Don’t know…..999998 | Don’t know…..999998 |

**Tank #3**

| Don’t know…..999998 | Don’t know…..999998 | Don’t know…..999998 | Don’t know…..999998 |
| 1/2 full….2 | 1/4 full….3 | Empty….4 | Don’t know….5 |
| Don’t know…..999998 | Don’t know…..999998 | Don’t know…..999998 | Don’t know…..999998 |
| Don’t know…..999998 | Don’t know…..999998 | Don’t know…..999998 | Don’t know…..999998 |

**Tank #4**

| Don’t know…..999998 | Don’t know…..999998 | Don’t know…..999998 | Don’t know…..999998 |
| 1/2 full….2 | 1/4 full….3 | Empty….4 | Don’t know….5 |
| Don’t know…..999998 | Don’t know…..999998 | Don’t know…..999998 | Don’t know…..999998 |
| Don’t know…..999998 | Don’t know…..999998 | Don’t know…..999998 | Don’t know…..999998 |

---

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures Steam, Fuel Oil, LPG, and All Fuels Energy Information Administration
Appendix D (Continued)

ENERGY SOURCES

<table>
<thead>
<tr>
<th>Type of Energy</th>
<th>Type of Energy</th>
<th>Type of Energy</th>
<th>Type of Energy</th>
</tr>
</thead>
</table>

Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
## Appendix D (Continued)

76. Which fuels or energy sources are used to supply the building’s need for: (Record responses by checking appropriate column(s) on facing page.)

<table>
<thead>
<tr>
<th>NOT PENDING IN BUILDING</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Heating. ..................</td>
</tr>
<tr>
<td>b. Air conditioning for cooling purposes.</td>
</tr>
<tr>
<td>c. Water heating other than for heating the building.</td>
</tr>
<tr>
<td>d. Electricity generation.</td>
</tr>
<tr>
<td>e. Manufacturing or any other type of industrial activity.</td>
</tr>
<tr>
<td>f. Cooking. ........................</td>
</tr>
</tbody>
</table>

73a. Have you converted from fuel oil to some other energy source since January 1, 1979 for: (Read categories)

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Heating. ...........................................</td>
<td></td>
</tr>
<tr>
<td>b. Air conditioning for cooling purposes. ..................</td>
<td></td>
</tr>
<tr>
<td>c. Water heating other than for heating the building.</td>
<td></td>
</tr>
<tr>
<td>d. Electricity generation. ..................................</td>
<td></td>
</tr>
<tr>
<td>e. Manufacturing or any other type of industrial activity.</td>
<td></td>
</tr>
<tr>
<td>f. Cooking. .............................................</td>
<td></td>
</tr>
</tbody>
</table>

71. Are there any boilers in the building?
   - Yes................................................. 1 (Q72)
   - No................................................ 2 (Q74)
   - Don’t know........................................... 8 (Q74)

72. How many boilers are there?

   [Number of Boilers]
   - Don’t know........................................... 8

73. Which fuels or energy sources are used to fire the boiler(s)?
### ENERGY SOURCES

<table>
<thead>
<tr>
<th>Type of Energy</th>
<th>Type of Energy</th>
<th>Type of Energy</th>
<th>Type of Energy</th>
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<td>...</td>
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</table>

#### Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
Appendix D (Continued)

ASK Q74-84 CONSECUTIVELY FOR EACH ENERGY SOURCE.

The following questions deal with specific companies that supply fuel to this building. The Department of Energy would like specific information on energy consumption that can only be collected by going directly to energy companies and suppliers. For this reason, I would like to find out who supplies the building's fuels or other types of energy.

74. In the past year, who has supplied the building's (MENTION ENERGY SOURCE)? IF MORE THAN ONE SUPPLIER IS MENTIONED, RECORD ADDITIONAL SUPPLIERS IN CONTINUATION BOOKLET.

Name..............................
Address............................
Zip Code...........................

FOR ELECTRICITY AND NATURAL GAS ENERGY SOURCES, SKIP TO BOX 8. FOR OTHER SOURCES CONTINUE.

75. Has the same supplier been used for the past year?

Yes......................
No......................

76. How many suppliers have been used in the past year?

77. What is/are the name(s) and address(es) of the other company(ies) that supplied (MENTION ENERGY SOURCE) in the past year? RECORD INFORMATION IN CONTINUATION BOOKLET.

BOX 8

IF MULTI-TENANT BUILDING, CONTINUE WITH Q78; OTHERWISE SKIP TO Q81.

78. How is the (MENTION ENERGY SOURCE) from (NAME OF SUPPLIER FROM Q74) billed; that is, are any of the tenants billed separately by the (NAME OF SUPPLIER) or is there just one bill for the entire building?

One bill......................
More than one bill.........

Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
### Appendix D (Continued)

**ESE:RGY SOURCES**

<table>
<thead>
<tr>
<th>Type of Energy</th>
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76.

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<th># of suppliers</th>
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78.

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*Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures*  
Steam, Fuel Oil, LPG, and All Fuels  
Energy Information Administration*
Appendix D (Continued)

70. How many separate bills are there?

80. We would like to contact each tenant who receives a bill from [NAME OF SUPPLIER] to obtain information about their energy consumption. Could you tell me the name of each tenant who is billed separately?

IF LIST IS NOT PROVIDED, RECORD NAME AND ADDRESS OF EACH TENANT WHO RECEIVES A SEPARATE BILL ON PAGES 28-31.

81. What is the name and address of the person or company who receives the bill for this building’s use of [MENTION ENERGY SOURCE] from the [NAME OF SUPPLIER]?

Name:............
Address:............

Zip Code:............

82. Does the bill you receive from [NAME OF SUPPLIER] cover just the square footage in this building or does it cover more than this building?

Just this building:............
More than this building:............
Don’t know:............

83. What is the name and address of the other building or facility that the bill covers?

Name:............
Address:............

Zip Code:............

IF BILLING ARRANGEMENT INCLUDES OTHER BUILDING, OBTAIN AS MUCH INFORMATION AS POSSIBLE. RECORD THIS INFORMATION ON THE PAGES 28-31 AND CONTACT SUPERVISOR.

84. Could you tell me how many meters you have for the [ENERGY SOURCE] coming into the building?

RETURN TO QUESTION 74 FOR OTHER ENERGY SOURCES; IF NO OTHER ENERGY SOURCES, CONTINUE.
### ENERGY SOURCES

<table>
<thead>
<tr>
<th>Type of Energy</th>
<th>Type of Energy</th>
<th>Type of Energy</th>
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</thead>
<tbody>
<tr>
<td>79. 1 of 20.6</td>
<td>2 of 25.85</td>
<td>3 of 25.85</td>
<td>4 of 25.85</td>
</tr>
<tr>
<td>81.</td>
<td>82.</td>
<td>83.</td>
<td>84.</td>
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<tr>
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<td>1 (284)</td>
<td>1 (284)</td>
<td>1 (284)</td>
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<tr>
<td>4 (284)</td>
<td>4 (284)</td>
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<td>4 (284)</td>
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<tr>
<td>84.</td>
<td>84.</td>
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</tr>
</tbody>
</table>

*If more, go to continuation sheet*
The President has issued a set of new Federal regulations which are designed to reduce the temperature in buildings. I have a few questions to find out if information about this program has been received by buildings across the country.

85. Informational booklets which look like this and contain information about the President's program are being sent to building managers nationwide. Have you, or has anyone else in this building received such a packet?

<table>
<thead>
<tr>
<th>SHOW INFORMATIONAL BOOKLET</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>Don't Know</td>
</tr>
</tbody>
</table>

86. The informational booklet contains a certificate which is to be displayed in the building. Has a certificate, which looks like this, been posted in this building?

<table>
<thead>
<tr>
<th>SHOW CERTIFICATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>Don't Know</td>
</tr>
</tbody>
</table>

87. Which of these three boxes on this certificate has been checked?

<table>
<thead>
<tr>
<th>POINT OUT BOXES ON CERTIFICATE READ CATEGORIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full compliance</td>
</tr>
<tr>
<td>Exempted compliance</td>
</tr>
<tr>
<td>Don't know</td>
</tr>
</tbody>
</table>

IF ASKED ABOUT COMPLIANCE WITH THE TEMPERATURE SETBACK PROGRAM, READ CONFIDENTIALITY STATEMENT ON COVER PLUS STATEMENT BELOW.

The purpose of this survey is to collect information which is necessary to evaluate the effectiveness of energy conservation programs. Information on participation in any of these programs by individuals will not be released to anyone for any purpose.

TIME ENDS
Appendix D (Continued)

ENERGY SOURCES

<table>
<thead>
<tr>
<th>Type of Energy</th>
<th>Type of Energy</th>
<th>Type of Energy</th>
<th>Type of Energy</th>
</tr>
</thead>
</table>

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
<table>
<thead>
<tr>
<th>BOX 9</th>
<th>WAIVER INSTRUCTIONS FOR EACH SUPPLIER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>One bill for entire building, obtain one waiver.</td>
</tr>
<tr>
<td></td>
<td>Obtained..........</td>
</tr>
<tr>
<td></td>
<td>Not obtained.......</td>
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<tr>
<td></td>
<td>Three bills or less, obtain waiver for each.</td>
</tr>
<tr>
<td></td>
<td>Obtained..........</td>
</tr>
<tr>
<td></td>
<td>Not obtained.......</td>
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<tr>
<td></td>
<td>Four bills or more, obtain waiver from building owner/manager only.</td>
</tr>
<tr>
<td></td>
<td>Obtained..........</td>
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<tr>
<td></td>
<td>Not obtained.......</td>
</tr>
<tr>
<td>Type of Energy</td>
<td>Type of Energy</td>
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</tr>
<tr>
<td>RECORD BELOW WAIVER RESULTS</td>
<td>RECORD BELOW WAIVER RESULTS</td>
</tr>
<tr>
<td>01 (Reason)</td>
<td>01 (Reason)</td>
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<tr>
<td>11 (Reason)</td>
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<td>21 (Reason)</td>
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Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
Appendix D (Continued)

ENERGY SOURCE: ____________________________________________
SUPPLIER’S NAME: __________________________________________

<table>
<thead>
<tr>
<th>Q. 80</th>
<th>LIST OF TENANTS RECEIVING SEPARATE BILLS</th>
<th>WAIVERS OBTAINED</th>
<th>NON NECESSARY</th>
<th>ADDITIONAL INFORMATION TO EXPLAIN BILLING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>Name</td>
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</tbody>
</table>

Use additional pages as needed to list separately billed tenants.

Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
### Appendix D (Continued)

ENERGY SOURCE:  

SUPPLIER'S NAME:  

<table>
<thead>
<tr>
<th>Q. 80</th>
<th>LIST OF TENANTS RECEIVING SEPARATE BILLS</th>
<th>WAIVER OBTAINED</th>
<th>YES</th>
<th>NO</th>
<th>NEEDED</th>
<th>ADDITIONAL INFORMATION TO EXPLAIN REASON</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
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</tbody>
</table>

Use additional pages as needed to list separately billed tenants.

*Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures Steam, Fuel Oil, LPG, and All Fuels*
*Energy Information Administration*
Appendix D (Continued)

ENERGY SOURCE: 
SUPPLIER’S NAME: 

<table>
<thead>
<tr>
<th>Q. 80</th>
<th>LIST OF TENANTS RECEIVING SEPARATE BILLS</th>
<th>WAIVERS OBTAINED</th>
<th>YES</th>
<th>NO</th>
<th>NOT NECESSARY</th>
<th>ADDITIONAL INFORMATION TO EXPLAIN BILLING</th>
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<tbody>
<tr>
<td>1</td>
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<td>Address</td>
<td></td>
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<td>2</td>
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</tbody>
</table>

Use additional pages as needed to list separately billed tenants.

Nonresidential Buildings Energy Consumption Survey:  
1979 Consumption and Expenditures  
Steam, Fuel Oil, LPG, and All Fuels  
Energy Information Administration
Appendix D (Continued)

<table>
<thead>
<tr>
<th>Q. NO</th>
<th>TENANTS RECEIVING SEPARATE BILLS</th>
<th>UNIVERSE ESTIMATED</th>
<th>NEEDED</th>
<th>ADDITIONAL INFORMATION TO EXPLAIN AS NEEDED</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Yes</td>
<td>No</td>
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<td></td>
<td>Address</td>
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<td>Name</td>
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<td>Name</td>
<td>Yes</td>
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<td>4)</td>
<td>Name</td>
<td>Yes</td>
<td>No</td>
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<td>5)</td>
<td>Name</td>
<td>Yes</td>
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<td>6)</td>
<td>Name</td>
<td>Yes</td>
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<td>7)</td>
<td>Name</td>
<td>Yes</td>
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<td>8)</td>
<td>Name</td>
<td>Yes</td>
<td>No</td>
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<td>Address</td>
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</tr>
</tbody>
</table>

Use additional pages as needed to list separately billed tenants.

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
INTERVIEWER OBSERVATIONS

IF LISTING DISAGREES WITH INTERVIEW DEFINITION OF BUILDING (I.E., IF BOX 2 IS CHECKED "INCORRECT" ON PAGE 1 OF QUESTIONNAIRE), COMPLETE QUESTION 1; OTHERWISE, SKIP TO QUESTION 2.

1. A. Please indicate the name and address(es) of the building from the listing sheet.
   Name: ____________________________
   Address: ____________________________

   B. Please indicate the name and address of the building as defined for the interview.
   Name: ____________________________
   Address: ____________________________

   C. Please explain the circumstances of the disagreement between listing and interview definition of the building.

   __________________________________________________________________________

2. Did you contact any other respondent than the person recorded on the front cover of the questionnaire?
   YES. ____________________________ 1 (Q3)
   NO. ____________________________ 2 (Q4)

3. Please list all respondents.
   Name: ____________________________
   Title: ____________________________
   Location: ____________________________
   Phone No.: ____________________________

   Name: ____________________________
   Title: ____________________________
   Location: ____________________________
   Phone No.: ____________________________

4. What is your observation of the type of building or kind of business that occurs within the building? Please be thorough in your description.

   __________________________________________________________________________

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
Appendix D (Continued)

5. Is this building free standing or attached to another building?
   - Free standing: 1
   - Attached: 2

6. Please describe any unusual circumstances you may have encountered in obtaining the waiver.

7. If shopping center/mall:
   A. Is this a strip shopping center or enclosed mall?
      - Strip shopping center: 1
      - Enclosed mall: 2
   B. Approximately how many establishments are in this shopping center/mall?
      - Less than 10: 1
      - 10-24: 1
      - 25-49: 1
      - 50-74: 1
      - 75-100: 1
      - Over 100: 1
Appendix D (Continued)

NON-INTERVIEW REPORT

1. Please explain in detail the reason you were unable to complete the interview.

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

2. What is your observation of the type of building or kind of business that occurs within the building?

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

3. Approximately how many square feet would you estimate to be in this building?

1,000 or less.............. 01
1,001 to 5,000.............. 02
5,001 to 10,000............ 03
10,001 to 25,000........... 04
25,001 to 50,000........... 05
50,001 to 100,000.......... 06
100,001 to 200,000........ 07
200,001 to 500,000........ 08
500,001 to 1 million....... 09
Over 1 million............. 10
Don't know.................. 98

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
## Record of Contacts

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Type of Contact</th>
<th>Contact Relates To</th>
<th>Results of Contact</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Interview</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Waiver</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Final Status on Interview and Waiver

(Circle one code)

- Interview Complete with all waivers . . . . 1
- Interview Complete without all waivers . . . 7
- Non-Respondent (Not eligible, not able to deliver)
- Non-Respondent (Not available, not interested)
- In need of respondent, other . . . . . . . . 5
- Insufficient Info. , out of segment; not a bldg. according to study
- Insufficient Info. , listing and interview not possible at this bldg. , see escape of bldg .
This appendix contains samples of the survey forms used to obtain consumption and expenditures data from the buildings' energy suppliers. The actual forms used were color-coded by fuel type. The color is indicated by a letter in the form number, i.e., "Y" stands for yellow (electricity), "B" for blue (natural gas), "P" for pink (fuel oil), and "G" for green (all other fuels).

For each fuel type, there were five forms, each covering a different situation. Form 1 (included here) was for an individual building with a single occupant. Form 2 was for an individual building with multiple occupants where a single waiver was obtained for the entire building. Form 3 covered individual buildings with multiple occupants where a waiver was obtained for each occupant. Form 4 covered individual buildings with multiple occupants where waivers were obtained for some, but not all occupants. Form 5 was for a group of buildings in the supplier's service area for which no waivers were obtained.
Appendix E (Continued)

Consumption data is to be provided for the building described above.

Data may be submitted directly on the reporting form inside this folder, or in any other format, such as a computer print-out, which provides the same information and is convenient for your company.

IF YOU HAVE ANY QUESTIONS, PLEASE CALL COLLECT TO: DONNA MORRIS (301) 881-5233

Information as required is authorized by Section 138 of the Federal Energy Administration Act of 1974 (PL 93-797), as amended, the Emergency Petroleum Allocation Act (PL 93-117), and the Energy Emergency Conservation Act (PL 94-162).

Any information we collect which will permit identification of respondents or their buildings will be confidential and used only for statistical purposes. Data that can be identified with individual respondents will not be disclosed or released to anyone (including the Department of Energy) for any other purpose except as required by law.
## ELECTRICITY USAGE

From December 1, 1979 through January 31, 1980:

### Important:
- Indicate in the box below the code name of the rate structure applicable to this customer.

**Code Name of Rate Schedule:**

<table>
<thead>
<tr>
<th>Consumption Period</th>
<th>Billing Period</th>
<th>Number of Hrs. Used</th>
<th>Demand</th>
<th>Total Dollar Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
<td></td>
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<td></td>
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<td>2</td>
<td>E</td>
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</table>

*Total Dollar Amount should include:*
- State and Local taxes,
- Fuel adjustment charges,
- System charges, and
- Demand charges.

*Total Dollar Amount should exclude:*
- Merchandise,
- Repair charges,
- Service charges, and
- Any other charges not specifically requested.

**If this customer is on a budgeted bill, do not provide the budgeted bill, provide instead the dollar amount that is the cost of the actual consumption in the period.**

According to your records, how many customers do you supply in this building? [ ]
Appendix E (Continued)

I hereby give permission to Nestal, Inc. to obtain energy consuming information for confidential use in connection with their survey for the U.S. Department of Energy. This authorization covers the total amount of fuels and the total price charged for fuels consumed during the 11 month period of December 1, 1978 to January 31, 1979 by the building in the box below.

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.

<table>
<thead>
<tr>
<th>BUILDING NAME</th>
<th>ADDRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CITY</td>
<td>STATE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SIGNATURE OF PERSON AUTHORIZING</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>EMPLOYED BY</th>
<th>ADDRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>TITLE</td>
<td>ADDRESS</td>
</tr>
<tr>
<td>TELEPHONE</td>
<td></td>
</tr>
</tbody>
</table>

CITY | STATE | ZIP CODE

PLEASE COMPLETE ONE BLOCK BELOW FOR EACH COMPANY THAT SUPPLIES FUEL USED BY YOUR NON-RESIDENTIAL BUILDING DURING DECEMBER, 1978.

<table>
<thead>
<tr>
<th>PRINT FULL NAME OF COMPANY</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADDRESS (IF KNOWN)</td>
</tr>
<tr>
<td>TELEPHONE:</td>
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<table>
<thead>
<tr>
<th>PRINT FULL NAME OF COMPANY</th>
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<tr>
<td>ADDRESS (IF KNOWN)</td>
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<td>TELEPHONE:</td>
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</table>

<table>
<thead>
<tr>
<th>PRINT FULL NAME OF COMPANY</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADDRESS (IF KNOWN)</td>
</tr>
<tr>
<td>TELEPHONE:</td>
</tr>
</tbody>
</table>

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures Steam, Fuel Oil, LPG, and All Fuels Energy Information Administration
Appendix E (Continued)

U.S. DEPARTMENT OF ENERGY
NON-RESIDENTIAL BUILDING ENERGY CONSUMPTION STUDY
Conducted by:
WESTAT
An Employee-Owned Research Corporation

Consumption data is to be provided for the building described above.

Data may be submitted directly on the reporting form inside this folder, or in any other format, such as a computer print-out, which provides the same information and is convenient for your company.

IF YOU HAVE ANY QUESTIONS, PLEASE CALL COLLECT TO: DONNA MORRIS (301) 881-5310

Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
Appendix E (Continued)

UTILITY GAS USAGE
From December 1, 1978 to January 31, 1983

<table>
<thead>
<tr>
<th>Code Name of Rate Schedule:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Utility Gas Usage</th>
<th>Quantity Used Expensed in Terms Of</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>100 Cubic Ft</td>
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<tr>
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<tr>
<td>14</td>
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</tr>
</tbody>
</table>

TOTAL DOLLAR AMOUNT should include:
- State and Local taxes,
- Fuel adjustment charges,
- System charges, and
- Demand charges.

TOTAL DOLLAR AMOUNT should exclude:
- Merchandise,
- Repair charges,
- Service charges, and
- Any other charges not specifically requested.

IF THIS CUSTOMER IS ON A BUDGETED BILL, DO NOT PROVIDE THE BUDGETED BILL, PROVIDE INSTEAD THE DOLLAR AMOUNT THAT IS THE COST OF THE ACTUAL CONSUMPTION IN THE PERIOD.

According to your records, how many customers do you supply in this building?

Form completed by: ____________________________ (Name) _______ (Telephone) _______ (Date)

Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
Appendix E (Continued)

U.S. DEPARTMENT OF ENERGY SURVEY
Authorization Form for Nonresidential Building Energy Consumption Survey

I hereby give permission to Westat, Inc. to obtain energy consumption information for confidential use in connection with their survey for the U.S. Department of Energy.

This authorization covers the total amount of fuels and the total price charged for fuels consumed during the 12 month period of December 1, 1978 to January 31, 1980 by the building in the box below.

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.

[Table]

<table>
<thead>
<tr>
<th>BUILDING NAME</th>
<th>ADDRESS</th>
<th>CITY</th>
<th>STATE</th>
<th>ZIP CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

SIGNATURE OF PERSON AUTHORIZING:

[Signature]

EMPLOYED BY: ADDRESS OF PERSON AUTHORIZING IF DIFFERENT FROM ABOVE:

[Employed By]

ADDRESS: TELEPHONE:

[Address]

[Telephone]

ADDRESS: TELEPHONE:

[Address]

[Telephone]

PLEASE COMPLETE ONE BLOCK BELOW FOR EACH COMPANY THAT SUPPLIES FUEL USED BY YOUR NON-RESIDENTIAL BUILDING SINCE DECEMBER, 1978.

[Table]

<table>
<thead>
<tr>
<th>ENERGY SOURCE</th>
<th>ADDRESS (IF KNOWN) - CITY AND STATE - ZIP CODE</th>
<th>TELEPHONE:</th>
<th>ACCOUNT NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
Appendix E (Continued)

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
Appendix E (Continued)

FUEL OIL

Please check each type of fuel oil supplied.

- Residential
- Commercial
- Industrial
- Other (Specify)

What is the present storage capacity of this customer's fuel oil tank(s)?

What was the storage capacity of this customer's fuel oil tank(s) on December 1, 1978?

Approximately, how much fuel oil did the customer's tanks contain on December 1, 1978?

Following the heating season each year, is there a date by which this customer's tanks are usually filled?

<table>
<thead>
<tr>
<th>Date</th>
<th>Gallons Delivered</th>
<th>Total Dollar Amount*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

Please report all fuel delivered between December 1, 1978 and January 31, 1980.

*Total Dollar Amount should include state and local taxes and exclude all merchant-

dise, repair, or service charges.

Form completed by: ________________________ Date: ____________

Telephone: ____________

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
Appendix E (Continued)

U.S. DEPARTMENT OF ENERGY
Non-Residential Building Energy Consumption Survey

I hereby give permission to Nestar, Inc. to obtain energy consumption information for confidential use in connection with their survey for the U.S. Department of Energy.

This authorization covers the total amount of fuel used and the total price charged for fuels consumed during the 12 month period of December 1, 1978 to January 30, 1980 by the building in the box below.

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.

BUILDING NAME

ADDRESS

CITY STATE ZIP

SIGNATURE OF PERSON AUTHORIZING

EMPLOYED BY

ADDRESS

TITLE

ADDRESS

CITY STATE ZIP

TELEPHONE 

Please complete one block below for each company that supplies fuel used by your non-residential building since December, 1978.

PRINT FULL NAME OF COMPANY

ENERGY SOURCE

ADDRESS (IF KNOWN) - CITY AND STATE - ZIP CODE

TELEPHONE: ACCOUNT NUMBER

PRINT FULL NAME OF COMPANY

ENERGY SOURCE

ADDRESS (IF KNOWN) - CITY AND STATE - ZIP CODE

TELEPHONE: ACCOUNT NUMBER

PRINT FULL NAME OF COMPANY

ENERGY SOURCE

ADDRESS (IF KNOWN) - CITY AND STATE - ZIP CODE

TELEPHONE: ACCOUNT NUMBER

Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
U.S. DEPARTMENT OF ENERGY
NON-RESIDENTIAL BUILDING ENERGY CONSUMPTION STUDY

Conducted by:

WESTAT
An Employee-Owned Research Corporation

Consumption data is to be provided for the building described above.

Data may be submitted directly on the reporting form inside this folder, or in any other format, such as a computer print-out, which provides the same information and is convenient for your company.

IF YOU HAVE ANY QUESTIONS, PLEASE CALL COLLECT TO: DONNA MORRIS (301) 881-5310

Participating in this survey is authorized by Section 114 of the Federal Energy Administration Act of 1974 (PL 93-275, as amended), the Emergency Petroleum Allocation Act (PL 95-159), and the Energy Emergency Conservation Act (PL 96-202).

Any information we collect which will allow identification of respondents or their buildings will be confidential and used only for statistical purposes. Data that can be identified with individual respondents will not be disclosed or released to anyone (including the Department of Energy) for any other purpose except as required by law.

Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
Appendix E (Continued)

INDIVIDUAL

Please check each type of fuel supplied:

- Anthracite Coal
- Propane
- Bituminous Coal
- Other (Please Specify)


<table>
<thead>
<tr>
<th>Time Period</th>
<th>Delivery Date</th>
<th>QUANTITY Expressed in: (Please specify unit, e.g., gallons, tons, etc.)</th>
<th>Total Dollar Amount*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td></td>
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<tr>
<td>14</td>
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<td></td>
</tr>
</tbody>
</table>

*Total Dollar Amount should include state and local taxes and exclude all merchandise, repair or service charges.

Form completed by: ___________________________  Name  ____________  Telephone  ____________  Date  ____________

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures Steam, Fuel Oil, LPG, and All Fuels Energy Information Administration
Appendix E (Continued)

U.S. DEPARTMENT OF ENERGY SURVEY
Authorization Form For
Non-Residential Building Energy Consumption Survey

I hereby give permission to Westat, Inc. to obtain energy consumption information
for confidential use in connection with their survey for the U.S. Department of Energy.
This authorization covers the total amount of fuels and the total price charged for
fuels consumed during the 14 month period of December 1, 1978 to January 30, 1980 by
the building in the box below.
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.

BUILDING NAME
ADDRESS
CITY STATE ZIP CODE

SIGNATURE OF PERSON AUTHORIZING

EMPLOYED BY
ADDRESS

ADDRESS OF PERSON AUTHORIZING IF DIFFERENT FROM ABOVE:
TITLE
ADDRESS

TELEPHONE 

PLEASE COMPLETE ONE BLOCK BELOW FOR EACH COMPANY THAT SUPPLIES FUEL USED BY

ENERGY SOURCE PRINT FULL NAME OF COMPANY
ADDRESS (IF KNOWN) - CITY AND STATE - ZIP CODE
TELEPHONE:
ACCOUNT NUMBER

ENERGY SOURCE PRINT FULL NAME OF COMPANY
ADDRESS (IF KNOWN) - CITY AND STATE - ZIP CODE
TELEPHONE:
ACCOUNT NUMBER

ENERGY SOURCE PRINT FULL NAME OF COMPANY
ADDRESS (IF KNOWN) - CITY AND STATE - ZIP CODE
TELEPHONE:
ACCOUNT NUMBER

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ADDRESS (IF KNOWN) - CITY AND STATE - ZIP CODE
TELEPHONE:
ACCOUNT NUMBER

Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
Appendix F

U.S. Weather Zone Map
Weather Zones

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

U.S. Census Regions and Divisions
U.S. Census Regions and Divisions

Appendix G

Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration

241
**Glossary**

Air Conditioning refers to the cooling of air by a refrigeration unit. It does not include fans, blowers, or evaporative cooling systems that are not connected to a refrigeration unit. Air-conditioning units which are not currently in working condition or not used but are in place in a building are included in this survey.

**Btu (British Thermal Units).** A Btu is the amount of energy required to raise the temperature of one pound of water, one degree Fahrenheit at or near 39.2 degrees Fahrenheit and one atmosphere of pressure.

Btu conversion factors for this survey are:

<table>
<thead>
<tr>
<th>Source</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>3,412 Btu/kilowatt-hour</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>1,019 Btu/cubic foot</td>
</tr>
<tr>
<td>Fuel Oil/Kerosene</td>
<td></td>
</tr>
<tr>
<td>Distillate</td>
<td>138,690 Btu/gallon</td>
</tr>
<tr>
<td>Residual</td>
<td>149,690 Btu/gallon</td>
</tr>
<tr>
<td>Kerosene</td>
<td>133,000 Btu/gallon</td>
</tr>
<tr>
<td>Grade Not Specified</td>
<td>140,000 Btu/gallon</td>
</tr>
<tr>
<td>Liquid Petroleum Gas</td>
<td>91,333 Btu/gallon</td>
</tr>
<tr>
<td>Steam</td>
<td>1,000 Btu/pound</td>
</tr>
</tbody>
</table>

Building Activity refers to the primary business, commerce, or function carried out by the occupants of a building. The activity categories were designed to group buildings having similar patterns of energy consumption after controlling for weather and size.

Building Conservation Features refer to the four types of materials or fixtures included in this survey, which may be installed in, or added to, a building to reduce the amount of energy consumed during the heating and/or cooling of the building.

Building Type is derived from the predominant activity in which the occupants of a building are engaged. For this report, mixed-use buildings (those buildings where 75 percent or more of the floorspace was not devoted to a single activity) have been categorized according to the predominant building activity. Each category is described below.

Assembly refers to large buildings used for the gathering of 50 or more persons for purposes such as social, recreational, or religious activities. Included in this category are the following building types:

- **Social/Public/Civic Assembly (fixed seating):** (meeting hall/lodge hall, convention hall/assembly hall, town hall, auditorium, lecture hall, student union, etc.)
- **Religious Assembly:** (Church, chapel, synagogue, mosque, etc.)
- **Recreational Assembly:** (Church, chapel, synagogue, mosque, etc.)
- **Recreational Facility:**
  - Gymnasium/YMCA or YWCA/indoor racket sports, recreation center/athletic facility
  - Poolroom
  - Amusement arcade
  - Skating rink
  - Bowling alley
  - Indoor pool
  - Other
- **Entertainment Building:**
  - Archive/library, museum/art gallery/exhibit hall
  - Observatory/planetarium

Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
(Building Type Continued, "Assembly")

- Concert hall
- Coliseum/arena (enclosed)
- Theater/movie/cinema
- Radio/TV studio or station
- Nightclub
- Other

Other Enclosed Assembly Building:
- Passenger terminal
- Armory
- Other

Nonenclosed or Partial Structure:
- Stadium
- Grandstand
- Other

Automotive Sales and Service Buildings include:
- Gas Stations
- Automobile Dealers
- Motor Vehicle Repair/Service

Education buildings house academic or technical instruction. This category includes:
- Preschool
- Elementary
- Junior High
- Senior High
- College or University
- Vocational School

Specific Building Types (on school campuses)
- Administration (see Office)
- Auditorium (see Assembly)
- Dormitory (see Lodging)
- Gymnasium (see Assembly)
- Infirmary (see Health Care)
- Library (see Assembly)
- Museum (see Assembly)
- Student union (see Assembly)
- School for mentally retarded (see Health Care)
- Stadium (see Assembly)

Food Sales and Service buildings include:

Cafeterias

Full-Service Restaurant: (Diner - limited menu, bar and grill - limited menu, coffee shop - limited menu, full menu service, bar, etc.)

Carry-Out Service: (Caterer, pizza parlor, sandwich shop, fast food etc.)
Glossary (Continued)

(Building Type Continued, "Food Sales and Service")

Retail Food Sales:
- Supermarket
- Specialty food store
- Meat/seafood market
- Retail bakery
- Farmer's market, fruit/vegetable market
- Other

Food-Related Activities/Other Activity Except Office or Residential (Mixed-Use):
- Food Sales or Service/Other Retail Sales
- Food Sales or Service/Other Service Activity
- Food Sales or Service/Storage (except supermarket)
- Other

Health Care buildings house diagnostic and treatment facilities for both in- and out-patient care. In-patient facilities treat the mentally or physically ill. Buildings for overnight care are also included. This type includes:

Medical Care Hospital: [General medical and surgical; chronic disease; medical infirmary (connected with institution); tuberculosis/other respiratory disease; orthopedic; maternity; ear, eye, nose, and throat; etc.]

Mental Facility: (Psychiatric, mental retardation)

Rehabilitation: (Narcotic/drug addiction, physical therapy, alcoholism, etc.)

Veterinary: (Hospital, kennel)

(Out-patient care may be medical, dental, or psychiatric. A building housing out-patient veterinary practices also falls into this category.) Buildings of this type include:
- Medical Clinic: (Abortion; ear, eye, nose, and throat; general)
- Mental Health Clinic
- Dental Clinic
- Veterinary Clinic

Lodging facilities refer to buildings offering multiple accommodations for long- or short-term residents. Included are

Short-Term Residence:
- Shelter home
- Motel
- Tourist home
- Hotel
- Convention hotel
- Inn
- Other

Long-Term Residence:
- Boarding house
- Orphanage

Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
Glossary (Continued)

(Building Type Continued, "Lodging")

- Home for aged, nursing home
- Convent/monastery
- Dormitory/sorority/fraternity
- Other

Office buildings are used for general office space, professional offices, and administrative offices. Included are

Professional Office Building: (Management consulting, engineering, medical, law, corporate, administration of an institution, mixed professional)

Financial Office Building: (Bank, insurance, securities, brokerage firm, real estate, etc.)

Data Processing:
- Computer center
- Other data processing

Offices/Other Activity (Except Residential): Mixed Use
- Office with retail (except food)
- Office with food sales or service
- Offices/services activity (other than food)
- Office/warehouse or storage
- Real estate/other commercial
- State or Federal capitol

Residential buildings serve as living quarters and have individual kitchen facilities.

Multi-Family:
- High-rise apartments
- Low-rise apartments

Single-Family:
- Detached
- Duplex
- Triplex
- Quadruplex
- Townhouse/rowhouse

Mobile Homes

Residential/Other Building Type (Mixed-Use):
- Residential/food-related
- Residential/sales (nonfood)
- Residential/office space
- Residential/service activity
- Residential/other use than above-mentioned

Retail Sales and Personal Services buildings are those housing sales and displays of goods or services (excluding food). Included are

Shopping Mall
Strip Shopping Center

Nonresidential Buildings Energy Consumption Survey: 1979 Consumption and Expenditures:
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
Glossary (Continued)

(Building Type Continued, "Retail Sales and Personal Services")

Retail Sales (Single establishment):
- Building materials, hardware, garden supply stores
- Department stores, apparel stores
- Furniture, home furnishings, and equipment stores
- Drugstores
- Multi-retail establishments
- Other retail stores

Wholesale Goods (except food)

Services (except food):
- Laundry/dry cleaner/car wash
- Post office
- Personal service
- Multi-service establishment
- Other service

Building Housing Two or More Services, Retail or Wholesale Establishments Not Previously Mentioned:
- Service/retail
- Retail/wholesale
- Service/wholesale
- Retail/wholesale/service

Warehouse and Storage buildings are used for the storage of goods, merchandise, raw materials, or manufactured products. Included are

Agricultural
- Warehouse—nonrefrigerated
- Refrigerated storage

Other

Storage/Retail, Wholesale, or Manufacturing:
- Storage/food processing
- Storage/retail sales (nonfood)
- Storage/wholesale (nonfood)
- Storage/manufacturing (nonfood)

Other buildings are those that do not fit into any of the previous categories. Included are

Crematorium
- Parking garage
- Hangar
- Telephone exchange

(Also included in the Other category are the building types Laboratory and Public Order and Safety)

Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
(Building Type Continued, "Other")

Laboratory buildings house equipment for experimental testing or for analysis. Included are:
- Mechanical/Electrical
- Medical/Dental
- Agricultural
- Other

Public Order and Safety buildings house establishments engaged in the preservation of law and order or in public safety.
- Fire station
- Police station
- Jail
- Reformatory
- Penitentiary
- Courthouse
- Sheriff's Office
- Other

Campus or complex refers to a well-defined geographic area containing a group of separate buildings that are operated as a unit (such as a college or university campus).

Census Region is an area consisting of various States selected according to population size and physical location. In this survey, the States were grouped into four regions:
- North Central - Ohio, Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, Kansas, Nebraska, North Dakota, and South Dakota.
- South - Maryland, Delaware, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Arkansas, Oklahoma, and Texas.

(Note: Alaska and Hawaii are normally considered parts of the western region but were not included in the sample for this survey.)

Central Air Conditioning serves all areas of the building that are air conditioned. Such systems are specially designed for each building.

Nonresidential Buildings Energy Consumption Survey:
1979 Consumption and Expenditures
Steam, Fuel Oil, LPG, and All Fuels
Energy Information Administration
Glossary (Continued)

Central Heating Systems. This heating equipment category represents two types of systems depending upon the location of the system. A central system located within the building (such as a furnace or a boiler) generates the heat but depends upon an additional system to distribute the heat. A central system located outside the building converts energy to a heated substance such as steam or hot water, which is then distributed to the heated parts of the building by a separate system wholly contained within the building.

Combination Air-Conditioning Systems are air-cooling systems composed of various types of equipment that are either combinations of window units, package units, or central systems.

Commercial Buildings are all nonresidential buildings with the exception of those where industrial activities occupy more of the total square footage than any other type of activity (see Nonresidential Buildings).

Conservation Practices refer to three types of actions that building owners or occupants may initiate, manually or automatically, to reduce the amount of energy consumed to heat or cool a building. The actions include reducing the heat or the cooling produced when the building is not in full use and having a regular maintenance program for the heating and/or air-conditioning systems.

Consumed refers to the amount of energy used by or delivered to the building during the 365-day period of calendar year 1979.

Cooling Degree-Days refer to the number of degrees the average daily temperature is above 65 degrees Fahrenheit. Normally, cooling is not required in a building when the outdoor average daily temperature is below 65 degrees. Cooling degree-days are determined by subtracting the base of 65 from the average daily temperature. For example, a day with an average temperature of 85 degrees has 20 cooling degree-days (85-65=20), while one with an average daily temperature of 65 degrees or lower has none.

Cubic foot (cu. ft.) is the amount of gas contained in a cube whose edge is one foot.

Electricity refers to the electric power supplied to a building by a central utility via underground or aboveground powerlines. It does not refer to electric power generated onsite for the exclusive use of the building. In this case, the fuel used for the generator would be indicated.

Energy Suppliers are the companies that provide electricity, natural gas, fuel oil, coal, or other forms of energy to the buildings and to the individual customers within the buildings.

 Establishment, as defined by the Standard Industrial Classification Manual, is "an economic unit, generally, at a single physical location where business is conducted or where services or industrial operations are performed."

Expenditures refer to the cost of energy consumed during the 365-day period of calendar year 1979. The total dollar amount includes State and local taxes, fuel adjustment charges, system charges, and demand charges. The total dollar amount excludes merchandise, repair charges, service charges, and any other charges not specifically requested. If the building (or separately billed establishments within a building) receives a budgeted bill, the budgeted bill is not provided. Instead, the actual consumption and expenditures are provided.
Forced Hot Air refers to a heat distribution system consisting of two types of units that distribute heat via fans: (1) a self-contained air-handling unit serving only a part of the building, and (2) a single central air-handling unit separate from the energy conversion system that distributes air throughout the building through ducts.

Fuel Oil refers to distillate fuel oil (No. 1, No. 2, or No. 4), residual fuel oil (No. 5 or No. 6), or kerosene that is burned for space- or water-heating purposes.

Glass as a Percentage of Exterior Surface refers to the proportion of glass to the exterior wall structure of the surface.

Heating Degree-Days refer to the number of degrees the average daily temperature is below 65 degrees Fahrenheit. Normally, heating is not required in a building when the outdoor average daily temperature is above 65 degrees. Heating degree-days are determined by subtracting the average daily temperature below 65 degrees from the base 65. For example, a day with an average temperature of 50 degrees has 15 heating degree-days (65 - 50 = 15), while one with an average daily temperature of 65 degrees or higher has none.

Hours of Operation During a Typical Week refer to the number of hours per week that a building is occupied by regular employees (employees responsible for carrying out the primary activity or activities of the building) and excludes hours when the building is occupied only by maintenance, security, or other support personnel. Many buildings do not maintain the same hours of operation during the year. Alternate schedules were reported for these buildings, but for this report "hours of operation" refer to the schedule followed most often. Other buildings do not have any regular schedule of hours, are open intermittently, or by appointment only, or are open without being staffed (this last category includes automatic bank tellers and roadside rest stops). These buildings were recorded as having zero operating hours, according to the definition given by the questionnaire, even though they were not vacant.

Imputation is a statistical method used to estimate the response to specific unanswered questions that should have been answered or were unknown at the time of the interview.

Insulation is any material (such as fiberglass, foam, loose fill, etc.) which, when placed between the interior of the building and the outdoor environment, reduces the amount of heat or cold lost to the environment.

KWh (kilowatt-hour) is a unit of work or energy equal to that expended by one kilowatt (100 watts) in one hour.

Kerosene is a generic name referring to a distilled product of oil or coal. Kerosene is similar to No. 1 distillate fuel oil and is used for space heating, water heating, cooking, or lighting.

LPG or Liquid Petroleum Gas is any gas fuel supplied to a building in liquid form. It is usually delivered by tank truck and stored near the building in a tank or a cylinder until used. Propane and butane are liquefied petroleum gases.

Master-Metering is the method used by utility companies (i.e., electricity and natural gas) to measure the total volume of energy used by several individual customers collectively.

Metropolitan refers to buildings located within Standard Metropolitan Statistical Areas (SMSA’s) as defined in the 1970 Census. Except in New England, an SMSA is a county or a group of contiguous counties that contains at least one city of 50,000 inhabitants or more or "twin cities."
with a combined population of at least 50,000. The contiguous counties are included in an SMSA if they are essentially metropolitan in character and are socially and economically integrated with the central city. In New England, SMSA's consist of towns and cities rather than counties. "Nonmetropolitan" refers to buildings not located within SMSA's as defined in the 1970 Census.

Multiple Building Unit is a single building address that at the time of the interview was discovered to be two or more separate buildings.

Natural Gas is utility gas supplied by pipeline to individual buildings by a central utility company. It does not refer to privately owned gas wells operated by a building owner.

Nonresidential Building is a roofed and walled structure that is used for some purpose other than just residential. The scope of this definition is quite broad and includes some buildings that are primarily residential (as well as commercial and industrial buildings). The term "residential" applies to structures where the primary activity is that of a dwelling for one or more households. Residential buildings were within the scope of the survey if they showed evidence of some kind of commercial or industrial activity. For example, a residential building, such as an apartment building, which also contained some obvious nonresidential activity, such as a store or an office, was considered a nonresidential building for the purposes of this survey. For a private residence to have been selected for this survey, it had to have a sign (large enough to be visible from the street) advertising the presence of some commercial or industrial activity.

Number of People Working in the Building is the normal number of people working in the building during a typical workday or during most of the year.

Number of Floors is the count of building levels in the tallest section of the building including parking areas, basements, or other floors below ground level.

Outside Shading includes window awnings or other features of the building that shade the exterior windows and thereby reduce the rate of solar penetration into the building. The outside shading may have been installed at the time of construction or since construction (retrofitted). In some buildings, outside shading may have been installed both at the time of construction and since construction. These buildings are reported in both categories. As a result, the total number of buildings for which outside shading is currently present is not a simple sum of these two categories.

Package Units refer to air-conditioning units that are built and assembled at a factory and installed as a unit to cool all, or portions of, a building.

Reduced Cooling refers to the manual or automatic reduction in the cooling produced by the air-conditioning system during the hours a building is not in full use. Buildings without air-conditioning systems or with only window air-conditioning units are reported as "Not Applicable."

Reduced Heating refers to the manual or automatic reduction in the heat produced by the heating system during the hours a building is not in full use. Buildings that do not have heating systems are reported as "Not Applicable."

Regular Maintenance refers to a systematic program for checking the heating and/or air-conditioning equipment on a regular basis (at least once a year), even if there are no apparent problems. Buildings that lack both...
heating and air-conditioning systems are reported as "Not Applicable." Buildings with only window air-conditioning units and no heating system are also reported as "Not Applicable."

Self-Contained Heating Units are units installed either in the building or on the roof that generate and deliver heat to the area served.

Separate Metering refers to the method by which utility companies, (i.e., electricity and natural gas) measure the volume of energy consumed by individual customers in the building.

Special Building List. Part of the sampling procedure entailed locating "large" buildings within the sampled PSU's. "Large" buildings were defined as those with 250,000 or more square feet of enclosed floorspace in PSU's that are Standard Metropolitan Statistical Areas. In the remaining one-third of the PSU's, buildings of 100,000 square feet or more were listed.

Special Zip Codes are allocated by the U.S. Postal Service to business establishments, government agencies, or buildings that have a high mail volume.

Steam Energy Source refers to buildings that purchase steam from steam generation and distribution companies serving municipal areas such as natural gas distributors. This does not refer to buildings that use purchased fuels to generate their own steam for use in the building or other buildings in a campus/complex situation.

Structure Type refers to whether the building is detached (stands alone), attached to other buildings on one or more sides, or is part of a shopping mall.

Tank Capacity is the amount of fuel oil or kerosene a tank can hold.

Tank Inventory is the amount of fuel oil or kerosene stored in the tank at the time of the building interview.

Total Square Footage refers to all the space enclosed within the exterior walls of the building. This includes indoor parking facilities and basements, and all space such as hallways, lobbies, stairways, and elevator shafts.

Treated Glass includes tinted, reflective, insulated, or thermal pane type of glass that, when installed in the exterior windows of a building, serve to reduce the rate of solar penetration into the building or the rate of heat or cold loss to the environment. Such forms of glass may have been installed at the time of construction or since construction (retrofitted). In some cases, treated glass may have been installed both at the time of construction and since construction. These buildings are reported in both categories. As a result, the total number of buildings for which treated glass is currently present is not a simple sum of these two categories.

Waiver is an authorization form instructing energy-supplying companies serving the buildings to release the volumes and costs of energy the buildings consumed over a specified period.

Weatherstripping or Caulking refers to any material that is placed between the door or window and the door or window frame in order to reduce the rate of heat or cold loss.
Glossary (Continued)

Window Unit air conditioners are self-contained units that are installed in a window or through the wall.

Year Constructed is the year in which the major or largest portion of a building was constructed.

Nonresidential Buildings Energy Consumption Survey:
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