

**Table C36. Total district heat consumption and expenditures, 2018**

|  | All buildings<br>using district heat |   | District heat<br>consumption                            |   | District heat<br>expenditures |
|--|--------------------------------------|---|---|---|-------------------------------|
|  | Number of<br>buildings<br>(thousand) | Total<br>floorspace<br>(million<br>square feet) | Floorspace<br>per building<br>(thousand<br>square feet) | Total<br>(trillion<br>British thermal<br>units [Btu]) | Total<br>(million<br>dollars) |
| <b>All buildings</b>                     | 86                                   | 6,745   | 78.1  | 305   | \$4,303                       |
| <b>Building floorspace (square feet)</b> |                                      |   |   |   |                               |
| 1,001 to 25,000                          | 47                                   | 554   | 11.8  | 30  | \$393                         |
| 25,001 to 50,000                         | 10                                   | 390   | 37.6  | 16  | \$180                         |
| 50,001 to 100,000                        | 15                                   | 1,117   | 74.1  | 53  | \$629                         |
| 100,001 to 200,000                       | 7                                    | 952   | 129.2   | 45  | \$600                         |
| 200,001 to 500,000                       | 5                                    | 1,450   | 312.3   | 73  | \$926                         |
| Over 500,000                             | 2                                    | 2,281   | 1064.3  | 88  | \$1,575                       |
| <b>Principal building activity</b>       |                                      |   |   |   |                               |
| Education                                | 39                                   | 1,375   | 35.5  | 60  | \$721                         |
| Food sales                               | N                                    | N   | N   | N   | N                             |
| Food service                             | Q                                    | Q   | Q   | Q   | Q                             |
| Health care                              | 2                                    | 887   | 355.1   | 39  | \$493                         |
| Inpatient                                | 1                                    | 743   | 556.9   | 36  | \$448                         |
| Outpatient                               | Q                                    | Q   | Q   | Q   | Q                             |
| Lodging                                  | 9                                    | 813   | 93.9  | 26  | \$335                         |
| Mercantile                               | Q                                    | Q   | Q   | Q   | Q                             |
| Retail (other than mall)                 | Q                                    | Q   | Q   | Q   | Q                             |
| Enclosed and strip malls                 | N                                    | N   | N   | N   | N                             |
| Office                                   | 10                                   | 1,853   | 185.3   | 57  | \$1,262                       |
| Public assembly                          | 13                                   | 942   | 75.2  | 63  | \$732                         |
| Public order and safety                  | Q                                    | Q   | Q   | Q   | Q                             |
| Religious worship                        | Q                                    | Q   | Q   | Q   | Q                             |
| Service                                  | Q                                    | Q   | Q   | Q   | Q                             |
| Warehouse and storage                    | Q                                    | Q   | Q   | Q   | Q                             |
| Other                                    | 3                                    | 433   | Q   | 36  | \$437                         |
| Vacant                                   | Q                                    | Q   | Q   | Q   | Q                             |
| <b>Year constructed</b>                  |                                      |   |   |   |                               |
| Before 1920                              | Q                                    | 333   | Q   | 17  | \$292                         |
| 1920 to 1945                             | 11                                   | 1,023   | 95.2  | 41  | \$827                         |
| 1946 to 1959                             | 20                                   | 686   | 34.0  | 34  | \$361                         |
| 1960 to 1969                             | 14                                   | 1,174   | 86.5  | 56  | \$738                         |
| 1970 to 1979                             | 8                                    | 985   | 122.0   | 45  | \$603                         |
| 1980 to 1989                             | 6                                    | 727   | 114.4   | 26  | \$344                         |
| 1990 to 1999                             | 8                                    | 585   | 76.4  | 24  | \$332                         |
| 2000 to 2009                             | 6                                    | 721   | 119.5   | 43  | \$557                         |
| 2010 to 2018                             | 4                                    | 511   | 140.7   | 19  | \$249                         |

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|                                       | All buildings using district heat |  | District heat consumption                      |  | District heat expenditures |
|---------------------------------------|-----------------------------------|--|--|--|----------------------------|
|                                       | Number of buildings (thousand)    | Total floorspace (million square feet) | Floorspace per building (thousand square feet) | Total (trillion British thermal units [Btu]) | Total (million dollars)    |
| <b>All buildings</b>                  | 86                                | 6,745                                  | 78.1   | 305  | \$4,303                    |
| <b>Census region and division</b>     |                                   |  |  |  |                            |
| Northeast                             | 29                                | 1,823                                  | 63.1   | 87   | \$1,465                    |
| New England                           | 16                                | 394                                    | 24.7   | 19   | \$266                      |
| Middle Atlantic                       | 13                                | 1,430                                  | 110.4  | 67   | \$1,199                    |
| Midwest                               | 15                                | 1,507                                  | 98.2   | 88   | \$1,017                    |
| East North Central                    | 10                                | 1,204                                  | 124.1  | 71   | \$810                      |
| West North Central                    | Q                                 | 303                                    | Q  | 18   | \$207                      |
| South                                 | 25                                | 2,130                                  | 85.3   | 91   | \$1,374                    |
| South Atlantic                        | Q                                 | 1,234                                  | Q  | Q  | \$829                      |
| East South Central                    | Q                                 | 294                                    | Q  | 6  | \$72                       |
| West South Central                    | 8                                 | Q                                      | 79.2   | Q  | Q                          |
| West                                  | 17                                | 1,284                                  | 74.7   | 39   | \$447                      |
| Mountain                              | 3                                 | 401                                    | Q  | 12   | \$120                      |
| Pacific                               | 14                                | 883                                    | 63.9   | 27   | \$328                      |
| <b>Climate zone<sup>a</sup></b>       |                                   |  |  |  |                            |
| Cold or very cold                     | 9                                 | 372                                    | 42.5   | 21   | \$243                      |
| Cool                                  | 22                                | 1,677                                  | 74.6   | 88   | \$992                      |
| Mixed mild                            | 26                                | 2,747                                  | 104.9  | 138  | \$2,424                    |
| Warm                                  | 25                                | 1,588                                  | 64.6   | 50   | \$547                      |
| Hot or very hot                       | 4                                 | 360                                    | 82.1   | 7  | \$96                       |
| <b>Number of floors</b>               |                                   |  |  |  |                            |
| 1                                     | 22                                | 320                                    | 14.3   | 18   | \$213                      |
| 2                                     | 23                                | 579                                    | 25.3   | 31   | \$389                      |
| 3                                     | 12                                | 770                                    | 65.1   | 34   | \$395                      |
| 4 to 9                                | 25                                | 3,052                                  | 121.4  | 143  | \$1,732                    |
| 10 or more                            | 4                                 | 2,023                                  | 487.6  | 79   | \$1,573                    |
| <b>Number of workers (main shift)</b> |                                   |  |  |  |                            |
| Fewer than 5                          | Q                                 | Q                                      | Q  | Q  | Q                          |
| 5 to 9                                | 15                                | 352                                    | 23.6   | 20   | \$257                      |
| 10 to 19                              | 15                                | 387                                    | 26.4   | 19   | \$218                      |
| 20 to 49                              | 12                                | 737                                    | 59.7   | 32   | \$391                      |
| 50 to 99                              | 8                                 | 1,019                                  | 120.6  | 49   | \$594                      |
| 100 to 249                            | 5                                 | 930                                    | 174.5  | 41   | \$531                      |
| 250 or more                           | 6                                 | 2,934                                  | 483.1  | 126  | \$2,104                    |

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|---|-----------------------------------|--|--|--|----------------------------|
|   | Number of buildings (thousand)    | Total floorspace (million square feet) | Floorspace per building (thousand square feet) | Total (trillion British thermal units [Btu]) | Total (million dollars)    |
| <b>All buildings</b>  | 86                                | 6,745                                  | 78.1   | 305  | \$4,303                    |
| <b>Weekly operating hours</b>   |                                   |  |  |  |                            |
| Fewer than 40   | Q                                 | Q                                      | Q  | Q  | Q                          |
| 40 to 48  | 13                                | 560                                    | 42.4   | 18   | \$219                      |
| 49 to 60  | 25                                | 1,253                                  | 51.1   | 39   | \$565                      |
| 61 to 84  | 19                                | 1,235                                  | 66.0   | 67   | \$974                      |
| 85 to 167   | 6                                 | 654                                    | 118.0  | 40   | \$443                      |
| Open continuously   | 15                                | 2,821                                  | 182.7  | 133  | \$2,010                    |
| <b>Ownership and occupancy</b>  |                                   |  |  |  |                            |
| Nongovernment owned   | 53                                | 3,637                                  | 68.8   | 159  | \$2,408                    |
| Owner occupied  | 48                                | 2,933                                  | 61.4   | 138  | \$2,031                    |
| Leased to tenant or tenants   | Q                                 | 688                                    | Q  | 21   | \$374                      |
| Unoccupied  | Q                                 | Q                                      | Q  | Q  | Q                          |
| Government owned  | 34                                | 3,107                                  | 92.7   | 146  | \$1,895                    |
| Federal   | Q                                 | 475                                    | Q  | 24   | \$527                      |
| State   | 26                                | 2,007                                  | 78.5   | 98   | \$1,085                    |
| Local   | 5                                 | 625                                    | 119.5  | 24   | \$283                      |
| <b>Party responsible for operation of energy systems</b>              |                                   |  |  |  |                            |
| Building owner  | 83                                | 6,326                                  | 76.4   | 295  | \$4,149                    |
| Business owner or tenant  | Q                                 | Q                                      | Q  | Q  | Q                          |
| Property management   | Q                                 | Q                                      | Q  | Q  | Q                          |
| Other   | Q                                 | Q                                      | Q  | Q  | Q                          |
| <b>Provider of direct input on energy-related equipment purchases</b> |                                   |  |  |  |                            |
| Building owner  | 82                                | 6,348                                  | 77.8   | 288  | \$4,067                    |
| Business owner or tenant  | Q                                 | Q                                      | Q  | Q  | Q                          |
| Property management   | Q                                 | Q                                      | Q  | Q  | Q                          |
| Other   | Q                                 | 221                                    | Q  | Q  | \$124                      |
| <b>Number of establishments</b>                                       |                                   |  |  |  |                            |
| 1   | 74                                | 4,517                                  | 60.8   | 212  | \$2,812                    |
| 2 to 5  | 9                                 | 1,005                                  | 110.3  | 46   | \$600                      |
| 6 to 10   | 1                                 | 322                                    | 396.1  | 9  | \$192                      |
| 11 to 20  | 1                                 | 221                                    | 362.1  | 10   | \$162                      |
| More than 20  | 1                                 | 648                                    | 605.6  | 26   | \$532                      |
| Currently unoccupied  | Q                                 | Q                                      | Q  | Q  | Q                          |

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|  | All buildings using district heat |  | District heat consumption                      |  | District heat expenditures |
|--|-----------------------------------|--|--|--|----------------------------|
|  | Number of buildings (thousand)    | Total floorspace (million square feet) | Floorspace per building (thousand square feet) | Total (trillion British thermal units [Btu]) | Total (million dollars)    |
| <b>All buildings</b>                                       | 86                                | 6,745                                  | 78.1   | 305  | \$4,303                    |
| <b>Predominant exterior wall material</b>                  |                                   |  |  |  |                            |
| Brick, stone, or stucco                                    | 63                                | 3,905                                  | 61.7   | 178  | \$2,563                    |
| Concrete (block or poured)                                 | 11                                | 1,214                                  | 109.1  | 52   | \$677                      |
| Concrete panels  | 2                                 | 647                                    | 271.3  | 30   | \$409                      |
| Siding or shingles   | Q                                 | Q                                      | Q  | Q  | Q                          |
| Metal panels   | Q                                 | Q                                      | Q  | Q  | Q                          |
| Window glass   | 1                                 | 621                                    | 450.8  | 27   | \$399                      |
| Other  | Q                                 | Q                                      | Q  | Q  | Q                          |
| <b>Predominant roof material</b>                           |                                   |  |  |  |                            |
| Metal surfacing  | 7                                 | 341                                    | 47.0   | 15   | \$228                      |
| Synthetic or rubber  | 22                                | 2,434                                  | 110.7  | 99   | \$1,245                    |
| Built-up   | 18                                | 2,169                                  | 120.0  | 113  | \$1,768                    |
| Slate or tile shingles                                     | 11                                | 417                                    | 37.9   | 17   | \$233                      |
| Wooden materials (including shingles)                      | N                                 | N                                      | N  | N  | N                          |
| Asphalt, fiberglass, or other shingles                     | 25                                | 778                                    | 31.2   | 35   | \$455                      |
| Concrete   | Q                                 | Q                                      | Q  | Q  | Q                          |
| Other  | 1                                 | 305                                    | 274.8  | 10   | \$186                      |
| <b>Roof tilt</b>   |                                   |  |  |  |                            |
| Flat   | 49                                | 5,420                                  | 110.3  | 245  | \$3,470                    |
| Shallow pitch  | 18                                | 616                                    | 34.8   | 36   | \$468                      |
| Steeper pitch  | 20                                | 709                                    | 36.2   | 24   | \$364                      |
| <b>Cool roof characteristics (more than one may apply)</b> |                                   |  |  |  |                            |
| White or reflective coating or paint                       | 23                                | 2,409                                  | 106.3  | 94   | \$1,274                    |
| White or reflective tiles or shingles                      | 2                                 | 205                                    | 123.6  | 9  | \$122                      |
| Aluminum coating   | Q                                 | Q                                      | Q  | Q  | Q                          |
| Ballasted roof system                                      | Q                                 | 709                                    | Q  | 35   | \$513                      |
| Other cool roof property                                   | Q                                 | Q                                      | Q  | Q  | Q                          |

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| <b>All buildings</b>                                    | 86                                | 6,745                                  | 78.1   | 305  | \$4,303                    |
| <b>Renovations since 2000 (more than one may apply)</b> |                                   |  |  |  |                            |
| Any type of renovation                                  | 39                                | 4,305                                  | 109.8  | 194  | \$2,773                    |
| Addition or annex                                       | Q                                 | 972                                    | Q  | 51   | \$658                      |
| Reduction in floorspace                                 | Q                                 | Q                                      | Q  | Q  | Q                          |
| Roof replacement  | 24                                | 2,058                                  | 86.6   | 88   | \$1,277                    |
| Interior wall reconfiguration                           | 20                                | 2,877                                  | 144.7  | 127  | \$1,891                    |
| Window replacement                                      | 14                                | 1,360                                  | Q  | 56   | \$871                      |
| HVAC equipment upgrade                                  | 27                                | 3,323                                  | 122.6  | 142  | \$2,119                    |
| Lighting upgrade  | 30                                | 3,474                                  | 116.2  | 147  | \$2,144                    |
| Electrical upgrade                                      | 20                                | 2,332                                  | 116.6  | 94   | \$1,403                    |
| Plumbing system upgrade                                 | 19                                | 2,224                                  | 119.8  | 94   | \$1,429                    |
| Insulation upgrade                                      | Q                                 | 1,188                                  | Q  | 41   | \$689                      |
| Fire, safety, or security upgrade                       | 25                                | 2,586                                  | 102.6  | 109  | \$1,657                    |
| Structural upgrade                                      | Q                                 | 719                                    | Q  | 28   | \$419                      |
| Other   | Q                                 | Q                                      | Q  | Q  | Q                          |
| No renovations  | 45                                | 2,061                                  | 46.2   | 99   | \$1,379                    |
| Buildings constructed 2013 or later                     | 3                                 | 379                                    | 147.3  | 12   | \$151                      |
| <b>Energy sources (more than one may apply)</b>         |                                   |  |  |  |                            |
| Electricity   | 86                                | 6,745                                  | 78.1   | 305  | \$4,303                    |
| Natural gas   | 38                                | 4,333                                  | 113.2  | 178  | \$2,420                    |
| Fuel oil  | 14                                | 2,990                                  | 210.7  | 115  | \$1,876                    |
| District heat   | 86                                | 6,745                                  | 78.1   | 305  | \$4,303                    |
| District chilled water                                  | 40                                | 3,471                                  | 86.3   | 160  | \$2,052                    |
| Propane   | Q                                 | 327                                    | Q  | 9  | \$139                      |
| Solar   | 5                                 | 664                                    | 121.2  | 30   | \$429                      |
| Wood, coal, and other                                   | Q                                 | Q                                      | Q  | Q  | Q                          |
| <b>Space-heating energy sources</b>                     |                                   |  |  |  |                            |
| District heat   | 83                                | 6,547                                  | 79.3   | 301  | \$4,269                    |
| District heat main                                      | 78                                | 6,090                                  | 78.0   | 293  | \$4,154                    |
| District heat secondary                                 | 5                                 | 729                                    | Q  | 17   | \$229                      |
| Other excluding district heat                           | Q                                 | Q                                      | Q  | Q  | Q                          |
| Buildings without heating                               | Q                                 | Q                                      | Q  | Q  | Q                          |

**Table C36. Total district heat consumption and expenditures, 2018**

|  | All buildings<br>using district heat |   | District heat<br>consumption                            |   | District heat<br>expenditures |
|--|--------------------------------------|---|---|---|-------------------------------|
|  | Number of<br>buildings<br>(thousand) | Total<br>floorspace<br>(million<br>square feet) | Floorspace<br>per building<br>(thousand<br>square feet) | Total<br>(trillion<br>British thermal<br>units [Btu]) | Total<br>(million<br>dollars) |
| <b>All buildings</b>                                 | 86                                   | 6,745   | 78.1  | 305   | \$4,303                       |
| <b>Primary space-heating<br/>energy source</b>       |                                      |   |   |   |                               |
| Electricity  | Q                                    | 258   | Q   | Q   | Q                             |
| Natural gas  | Q                                    | 378   | Q   | 8   | \$91                          |
| Fuel oil   | N                                    | N   | N   | N   | N                             |
| District heat  | 78                                   | 6,090   | 78.0  | 293   | \$4,154                       |
| Propane  | N                                    | N   | N   | N   | N                             |
| Other sources <sup>b</sup>                           | N                                    | N   | N   | N   | N                             |
| <b>Cooling energy sources</b>                        |                                      |   |   |   |                               |
| District heat  | Q                                    | Q   | Q   | Q   | Q                             |
| Other excluding district heat                        | 73                                   | 6,335   | 87.1  | 274   | \$3,903                       |
| Buildings without cooling                            | Q                                    | Q   | Q   | Q   | Q                             |
| <b>Water-heating energy sources</b>                  |                                      |   |   |   |                               |
| District heat  | 38                                   | 4,206   | 109.6   | 209   | \$3,121                       |
| Other excluding district heat                        | 46                                   | 2,452   | 53.3  | 93  | \$1,155                       |
| Buildings without water heating                      | Q                                    | Q   | Q   | Q   | Q                             |
| <b>Cooking energy sources</b>                        |                                      |   |   |   |                               |
| District heat  | 2                                    | 768   | Q   | 33  | \$429                         |
| Other excluding district heat                        | 16                                   | 2,785   | 172.4   | 128   | \$1,862                       |
| Buildings without cooking                            | 68                                   | 3,191   | 47.0  | 143   | \$2,013                       |
| <b>Energy end uses<br/>(more than one may apply)</b> |                                      |   |   |   |                               |
| Buildings with space heating                         | 85                                   | 6,726   | 79.5  | 305   | \$4,302                       |
| Buildings with cooling                               | 74                                   | 6,554   | 89.1  | 292   | \$4,158                       |
| Buildings with water heating                         | 84                                   | 6,657   | 78.9  | 303   | \$4,277                       |
| Buildings with cooking                               | 19                                   | 3,553   | 192.1   | 162   | \$2,290                       |
| Buildings with manufacturing                         | 1                                    | 284   | 301.6   | 15  | Q                             |
| Buildings with electricity<br>generation             | 20                                   | 3,848   | 189.3   | 155   | \$2,347                       |
| Buildings with lighting                              | 86                                   | 6,745   | 78.1  | 305   | \$4,303                       |
| <b>Percent of floorspace heated</b>                  |                                      |   |   |   |                               |
| Not heated   | Q                                    | Q   | Q   | Q   | Q                             |
| 1% to 50%  | Q                                    | Q   | Q   | Q   | Q                             |
| 51% to 99%   | 19                                   | 2,154   | 113.0   | 94  | \$1,366                       |
| 100%   | 65                                   | 4,432   | 68.5  | 209   | \$2,919                       |

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| <b>All buildings</b>   | 86                                | 6,745                                  | 78.1   | 305  | \$4,303                    |
| <b>Heating equipment (more than one may apply)</b>           |                                   |  |  |  |                            |
| Packaged heating units                                       | 8                                 | 1,169                                  | 155.6  | 35   | \$483                      |
| Furnaces   | Q                                 | Q                                      | Q  | Q  | Q                          |
| Individual space heaters                                     | 7                                 | 794                                    | 114.9  | 29   | \$416                      |
| Boilers  | Q                                 | 617                                    | Q  | 21   | \$282                      |
| Heat pumps   | 5                                 | 738                                    | Q  | 16   | \$235                      |
| District heat  | 83                                | 6,547                                  | 79.3   | 301  | \$4,269                    |
| Duct reheat  | Q                                 | 489                                    | Q  | 17   | \$277                      |
| Other  | Q                                 | Q                                      | Q  | Q  | Q                          |
| <b>HVAC features (more than one may apply)</b>               |                                   |  |  |  |                            |
| Economizer cycle   | 30                                | 4,645                                  | 155.8  | 209  | \$3,068                    |
| Variable air volume (VAV) system                             | 39                                | 4,814                                  | 123.1  | 216  | \$3,104                    |
| Dedicated outside air system (DOAS)                          | 9                                 | 1,411                                  | 151.2  | 59   | \$763                      |
| Demand controlled ventilation (DCV)                          | 8                                 | 989                                    | 122.6  | 48   | \$631                      |
| Regular HVAC maintenance                                     | 78                                | 6,492                                  | 83.1   | 289  | \$4,105                    |
| Building automation system (BAS) controls heating or cooling | 48                                | 5,493                                  | 114.7  | 252  | \$3,657                    |
| Internet-connected or smart thermostat                       | Q                                 | Q                                      | Q  | Q  | Q                          |
| Programmable thermostat                                      | Q                                 | Q                                      | Q  | Q  | Q                          |
| <b>Water-heating equipment</b>                               |                                   |  |  |  |                            |
| Centralized system   | 63                                | 4,583                                  | 72.9   | 217  | \$3,025                    |
| Distributed system   | 16                                | 772                                    | 48.7   | 31   | \$491                      |
| Combination of centralized and distributed systems           | 6                                 | 1,302                                  | Q  | 54   | \$761                      |
| <b>Generation technologies (more than one may apply)</b>     |                                   |  |  |  |                            |
| Reciprocating engine generators                              | 14                                | 3,250                                  | 224.3  | 135  | \$2,080                    |
| Solar panels   | 5                                 | 647                                    | 129.2  | 27   | \$401                      |
| Other generation technology                                  | 3                                 | 353                                    | 139.7  | 9  | \$157                      |

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| <b>All buildings</b>   | 86                                | 6,745                                  | 78.1   | 305  | \$4,303                    |
| <b>Food preparation or serving areas in non-food service buildings (more than one may apply)</b> |                                   |  |  |  |                            |
| Snack bar, concession stand, or coffee shop  | 4                                 | 1,722                                  | 408.1  | 75   | \$993                      |
| Fast food or small restaurant  | 3                                 | 1,064                                  | Q  | 51   | \$665                      |
| Cafeteria or large restaurant  | 4                                 | 2,009                                  | 458.8  | 82   | \$1,255                    |
| Commercial kitchen or food preparation area  | 5                                 | 1,960                                  | 399.2  | 80   | \$1,212                    |
| Small kitchen area   | 10                                | 1,725                                  | 174.1  | 66   | \$975                      |

Data source: U.S. Energy Information Administration, Forms EIA-871A and D of the *2018 Commercial Buildings Energy Consumption Survey*  
Notes: Because of rounding, data may not sum to totals. The *Guide to the 2018 CBECS Tables* and *CBECS Terminology* contain definitions of terms used in these tables and comparisons between previous CBECS tables. You can access both references from <http://www.eia.gov/consumption/commercial/data/2018/>.

Data are sample survey estimates with relative standard errors published in a tab on the Excel worksheet for this table.

Estimates in the *energy end uses* category represent total consumption and expenditures in buildings that have the end use but not the consumption and expenditures specifically for that end use.

HVAC = Heating, ventilation, and air conditioning.

<sup>a</sup>*Climate zones* are based on ASHRAE Standard 169-2021; see <https://www.eia.gov/consumption/commercial/maps.php#defined>.

<sup>b</sup>*Other sources* includes wood, coal, solar, and all other energy sources.

Q = Data withheld either because the relative standard error was greater than 50% or the reporting sample had fewer than 20 buildings.

N = No buildings in reporting sample.



**Relative standard errors (RSEs) for Table C36. Total district heat consumption and expenditures, 2018**

|  | RSEs for all buildings using district heat |                  |                         | RSEs for district heat consumption | RSEs for district heat expenditures |
|--|--|------------------|-------------------------|------------------------------------|-------------------------------------|
|  | Number of buildings                        | Total floorspace | Floorspace per building | Total                              | Total                               |
| <b>All buildings</b>                     | 14.7                                       | 11.4             | 12.3                    | 14.3                               | 14.5                                |
| <b>Building floorspace (square feet)</b> |  |                  |                         |                                    |                                     |
| 1,001 to 25,000                          | 22.5                                       | 22.2             | 11.7                    | 27.7                               | 28.1                                |
| 25,001 to 50,000                         | 27.8                                       | 27.1             | 3.9                     | 34.0                               | 33.6                                |
| 50,001 to 100,000                        | 19.7                                       | 20.3             | 3.3                     | 28.1                               | 32.7                                |
| 100,001 to 200,000                       | 24.1                                       | 21.8             | 3.9                     | 29.7                               | 34.1                                |
| 200,001 to 500,000                       | 20.2                                       | 18.2             | 5.2                     | 21.5                               | 18.7                                |
| Over 500,000                             | 13.1                                       | 13.2             | 8.9                     | 12.7                               | 17.2                                |
| <b>Principal building activity</b>       |  |                  |                         |                                    |                                     |
| Education                                | 24.5                                       | 21.0             | 22.9                    | 29.4                               | 35.7                                |
| Food sales                               | 0.0  | 0.0              | 0.0                     | 0.0                                | 0.0                                 |
| Food service                             | 79.3                                       | 81.8             | 116.8                   | 88.3                               | 88.6                                |
| Health care                              | 34.0                                       | 16.4             | 34.3                    | 15.0                               | 15.9                                |
| Inpatient                                | 20.1                                       | 15.9             | 12.9                    | 15.1                               | 15.4                                |
| Outpatient                               | 67.7                                       | 53.1             | 47.5                    | 45.0                               | 54.3                                |
| Lodging                                  | 30.6                                       | 24.8             | 19.6                    | 29.8                               | 27.6                                |
| Mercantile                               | 70.4                                       | 70.4             | 0.0                     | 70.4                               | 70.4                                |
| Retail (other than mall)                 | 70.4                                       | 70.4             | 0.0                     | 70.4                               | 70.4                                |
| Enclosed and strip malls                 | 0.0  | 0.0              | 0.0                     | 0.0                                | 0.0                                 |
| Office                                   | 27.0                                       | 15.2             | 29.2                    | 15.1                               | 19.6                                |
| Public assembly                          | 28.9                                       | 16.9             | 23.7                    | 18.8                               | 17.5                                |
| Public order and safety                  | 54.0                                       | 47.5             | 74.2                    | 64.2                               | 65.0                                |
| Religious worship                        | 110.3                                      | 104.2            | 440.1                   | 109.3                              | 108.3                               |
| Service                                  | 74.4                                       | 64.1             | 38.5                    | 81.5                               | 74.6                                |
| Warehouse and storage                    | 69.7                                       | 86.2             | 70.8                    | 85.2                               | 87.2                                |
| Other                                    | 46.6                                       | 32.8             | 63.9                    | 35.7                               | 36.0                                |
| Vacant                                   | 84.7                                       | 62.3             | 146.4                   | 63.8                               | 64.1                                |
| <b>Year constructed</b>                  |  |                  |                         |                                    |                                     |
| Before 1920                              | 55.0                                       | 33.8             | 63.9                    | 47.3                               | 46.7                                |
| 1920 to 1945                             | 39.0                                       | 29.6             | 45.3                    | 27.0                               | 30.1                                |
| 1946 to 1959                             | 34.5                                       | 23.5             | 26.3                    | 22.3                               | 21.2                                |
| 1960 to 1969                             | 36.4                                       | 22.8             | 43.0                    | 29.9                               | 26.4                                |
| 1970 to 1979                             | 32.4                                       | 14.9             | 30.4                    | 18.2                               | 16.0                                |
| 1980 to 1989                             | 33.9                                       | 16.2             | 25.1                    | 23.5                               | 22.0                                |
| 1990 to 1999                             | 36.6                                       | 20.2             | 37.5                    | 20.6                               | 21.5                                |
| 2000 to 2009                             | 28.3                                       | 16.7             | 21.2                    | 22.2                               | 22.1                                |
| 2010 to 2018                             | 32.8                                       | 30.4             | 19.9                    | 39.1                               | 45.9                                |

**Relative standard errors (RSEs) for Table C36. Total district heat consumption and expenditures, 2018**

|                                       | RSEs for all buildings<br>using district heat |                     |                            | RSEs for district<br>heat<br>consumption | RSEs for district<br>heat<br>expenditures |
|---------------------------------------|---|---------------------|----------------------------|--|---|
|                                       | Number of<br>buildings                        | Total<br>floorspace | Floorspace<br>per building | Total                                    | Total                                     |
| <b>All buildings</b>                  | 14.7  | 11.4                | 12.3                       | 14.3                                     | 14.5                                      |
| <b>Census region and division</b>     |   |                     |                            |  |   |
| Northeast                             | 23.2  | 9.5                 | 18.3                       | 11.0                                     | 10.4                                      |
| New England                           | 35.8  | 29.5                | 26.8                       | 25.7                                     | 25.9                                      |
| Middle Atlantic                       | 27.8  | 9.4                 | 25.0                       | 12.5                                     | 11.6                                      |
| Midwest                               | 29.3  | 18.6                | 31.2                       | 16.4                                     | 16.6                                      |
| East North Central                    | 33.3  | 24.2                | 36.6                       | 20.3                                     | 20.6                                      |
| West North Central                    | 54.5  | 17.2                | 77.5                       | 20.4                                     | 23.6                                      |
| South                                 | 35.2  | 30.2                | 26.0                       | 40.2                                     | 39.3                                      |
| South Atlantic                        | 54.9  | 44.2                | 53.2                       | 51.0                                     | 44.5                                      |
| East South Central                    | 74.3  | 49.6                | 55.0                       | 46.4                                     | 46.8                                      |
| West South Central                    | 49.4  | 53.4                | 20.3                       | 78.2                                     | 83.5                                      |
| West                                  | 26.8  | 16.5                | 30.5                       | 30.4                                     | 29.2                                      |
| Mountain                              | 47.5  | 33.8                | 51.0                       | 39.2                                     | 36.8                                      |
| Pacific                               | 31.3  | 18.4                | 39.1                       | 40.3                                     | 37.6                                      |
| <b>Climate zone<sup>a</sup></b>       |   |                     |                            |  |   |
| Cold or very cold                     | 47.6  | 24.8                | 29.8                       | 27.1                                     | 29.5                                      |
| Cool                                  | 31.4  | 20.6                | 30.8                       | 17.7                                     | 17.6                                      |
| Mixed mild                            | 24.8  | 17.9                | 17.5                       | 23.7                                     | 22.3                                      |
| Warm                                  | 35.3  | 31.8                | 32.7                       | 48.5                                     | 43.5                                      |
| Hot or very hot                       | 31.0  | 25.5                | 39.6                       | 18.8                                     | 20.5                                      |
| <b>Number of floors</b>               |   |                     |                            |  |   |
| 1                                     | 34.6  | 25.4                | 24.9                       | 35.0                                     | 34.0                                      |
| 2                                     | 32.5  | 20.5                | 24.1                       | 23.9                                     | 25.5                                      |
| 3                                     | 27.7  | 22.6                | 18.1                       | 26.2                                     | 26.2                                      |
| 4 to 9                                | 22.2  | 16.8                | 12.0                       | 20.3                                     | 22.4                                      |
| 10 or more                            | 12.1  | 16.3                | 10.0                       | 17.1                                     | 17.5                                      |
| <b>Number of workers (main shift)</b> |   |                     |                            |  |   |
| Fewer than 5                          | 31.8  | 26.8                | 23.9                       | 35.5                                     | 34.5                                      |
| 5 to 9                                | 34.5  | 24.8                | 23.6                       | 32.2                                     | 35.2                                      |
| 10 to 19                              | 38.4  | 25.6                | 29.1                       | 30.9                                     | 30.0                                      |
| 20 to 49                              | 22.6  | 23.1                | 11.3                       | 31.1                                     | 34.4                                      |
| 50 to 99                              | 27.4  | 26.1                | 14.3                       | 33.3                                     | 39.8                                      |
| 100 to 249                            | 21.3  | 17.4                | 12.5                       | 21.5                                     | 24.1                                      |
| 250 or more                           | 20.8  | 12.0                | 18.6                       | 13.0                                     | 15.2                                      |

**Relative standard errors (RSEs) for Table C36. Total district heat consumption and expenditures, 2018**

|   | RSEs for all buildings<br>using district heat |                     |                            | RSEs for district<br>heat<br>consumption | RSEs for district<br>heat<br>expenditures |
|---|---|---------------------|----------------------------|--|---|
|   | Number of<br>buildings                        | Total<br>floorspace | Floorspace<br>per building | Total                                    | Total                                     |
| <b>All buildings</b>  | 14.7  | 11.4                | 12.3                       | 14.3                                     | 14.5                                      |
| <b>Weekly operating hours</b>   |   |                     |                            |  |   |
| Fewer than 40   | 43.3  | 27.7                | 28.4                       | 30.6                                     | 31.2                                      |
| 40 to 48  | 36.5  | 25.2                | 32.3                       | 30.1                                     | 29.8                                      |
| 49 to 60  | 31.8  | 20.9                | 34.8                       | 21.8                                     | 21.8                                      |
| 61 to 84  | 34.4  | 26.8                | 28.2                       | 36.3                                     | 39.2                                      |
| 85 to 167   | 21.6  | 18.1                | 13.3                       | 20.9                                     | 21.5                                      |
| Open continuously   | 21.5  | 13.5                | 15.5                       | 14.8                                     | 15.2                                      |
| <b>Ownership and occupancy</b>  |   |                     |                            |  |   |
| Nongovernment owned   | 19.3  | 13.0                | 17.7                       | 17.5                                     | 18.4                                      |
| Owner occupied  | 20.2  | 14.1                | 18.4                       | 19.5                                     | 21.1                                      |
| Leased to tenant or tenants   | 52.2  | 19.7                | 72.2                       | 25.3                                     | 18.4                                      |
| Unoccupied  | 51.6  | 51.6                | 0.0                        | 51.6                                     | 51.6                                      |
| Government owned  | 22.3  | 17.3                | 17.5                       | 19.8                                     | 19.4                                      |
| Federal   | 73.1  | 34.9                | 160.2                      | 36.5                                     | 46.6                                      |
| State   | 27.2  | 26.0                | 24.6                       | 27.9                                     | 25.9                                      |
| Local   | 33.2  | 17.8                | 32.9                       | 18.0                                     | 17.0                                      |
| <b>Party responsible for operation of energy systems</b>              |   |                     |                            |  |   |
| Building owner  | 15.1  | 12.2                | 13.0                       | 14.8                                     | 14.8                                      |
| Business owner or tenant  | 37.6  | 38.9                | 28.8                       | 27.0                                     | 40.1                                      |
| Property management   | 55.9  | 28.1                | 39.8                       | 43.4                                     | 38.8                                      |
| Other   | 70.6  | 37.2                | 167.5                      | 42.3                                     | 48.0                                      |
| <b>Provider of direct input on energy-related equipment purchases</b> |   |                     |                            |  |   |
| Building owner  | 15.2  | 12.1                | 13.2                       | 15.0                                     | 14.9                                      |
| Business owner or tenant  | 40.3  | 21.2                | 33.6                       | 73.0                                     | 64.2                                      |
| Property management   | 58.7  | 59.7                | 81.2                       | 68.0                                     | 58.1                                      |
| Other   | 56.9  | 31.4                | 57.1                       | 54.2                                     | 47.8                                      |
| <b>Number of establishments</b>                                       |   |                     |                            |  |   |
| 1   | 15.9  | 15.1                | 14.3                       | 18.6                                     | 19.6                                      |
| 2 to 5  | 37.6  | 15.4                | 44.7                       | 16.1                                     | 17.2                                      |
| 6 to 10   | 28.1  | 34.1                | 27.4                       | 26.4                                     | 31.5                                      |
| 11 to 20  | 35.8  | 36.0                | 31.5                       | 49.0                                     | 44.8                                      |
| More than 20  | 23.0  | 18.2                | 20.6                       | 19.1                                     | 25.4                                      |
| Currently unoccupied  | 94.1  | 75.1                | 184.7                      | 74.6                                     | 74.7                                      |

**Relative standard errors (RSEs) for Table C36. Total district heat consumption and expenditures, 2018**

|  | RSEs for all buildings<br>using district heat |                     |                            | RSEs for district<br>heat<br>consumption | RSEs for district<br>heat<br>expenditures |
|--|---|---------------------|----------------------------|--|---|
|  | Number of<br>buildings                        | Total<br>floorspace | Floorspace<br>per building | Total                                    | Total                                     |
| <b>All buildings</b>   | 14.7  | 11.4                | 12.3                       | 14.3                                     | 14.5                                      |
| <b>Predominant exterior wall material</b>                      |   |                     |                            |  |   |
| Brick, stone, or stucco  | 18.4  | 18.0                | 15.5                       | 20.4                                     | 20.5                                      |
| Concrete (block or poured)                                     | 31.2  | 24.0                | 33.8                       | 24.1                                     | 22.1                                      |
| Concrete panels  | 16.6  | 19.0                | 15.7                       | 25.2                                     | 26.9                                      |
| Siding or shingles   | 87.9  | 54.6                | 191.8                      | 48.1                                     | 55.6                                      |
| Metal panels   | 49.3  | 40.6                | 47.9                       | 39.0                                     | 42.1                                      |
| Window glass   | 31.6  | 19.3                | 29.1                       | 17.4                                     | 16.4                                      |
| Other  | 52.7  | 46.4                | 58.8                       | 59.8                                     | 69.5                                      |
| <b>Predominant roof material</b>                               |   |                     |                            |  |   |
| Metal surfacing  | 37.3  | 24.0                | 34.3                       | 29.4                                     | 33.9                                      |
| Synthetic or rubber  | 24.7  | 16.1                | 19.3                       | 15.0                                     | 14.7                                      |
| Built-up   | 31.1  | 16.7                | 35.4                       | 22.2                                     | 23.8                                      |
| Slate or tile shingles   | 33.9  | 26.0                | 23.6                       | 35.7                                     | 30.8                                      |
| Wooden materials (including<br>shingles)                       | 0.0   | 0.0                 | 0.0                        | 0.0                                      | 0.0                                       |
| Asphalt, fiberglass, or<br>other shingles                      | 30.4  | 16.9                | 27.8                       | 19.0                                     | 18.1                                      |
| Concrete   | 34.9  | 33.7                | 11.1                       | 50.3                                     | 46.3                                      |
| Other  | 32.1  | 25.9                | 33.6                       | 19.6                                     | 23.4                                      |
| <b>Roof tilt</b>   |   |                     |                            |  |   |
| Flat   | 17.4  | 11.7                | 14.9                       | 14.0                                     | 14.1                                      |
| Shallow pitch  | 30.5  | 27.1                | 24.1                       | 32.7                                     | 33.9                                      |
| Steeper pitch  | 37.3  | 22.1                | 37.0                       | 22.1                                     | 25.3                                      |
| <b>Cool roof characteristics (more than one<br/>may apply)</b> |   |                     |                            |  |   |
| White or reflective coating or paint                           | 26.9  | 17.5                | 20.1                       | 23.1                                     | 25.0                                      |
| White or reflective tiles or shingles                          | 42.4  | 22.3                | 38.1                       | 29.4                                     | 28.2                                      |
| Aluminum coating   | 58.2  | 35.8                | 58.2                       | 45.1                                     | 43.5                                      |
| Ballasted roof system  | 52.0  | 14.5                | 75.2                       | 20.8                                     | 19.3                                      |
| Other cool roof property                                       | 44.2  | 32.9                | 21.2                       | 39.6                                     | 29.5                                      |

**Relative standard errors (RSEs) for Table C36. Total district heat consumption and expenditures, 2018**

|   | RSEs for all buildings using district heat |                  |                         | RSEs for district heat consumption | RSEs for district heat expenditures |
|---|--|------------------|-------------------------|------------------------------------|-------------------------------------|
|   | Number of buildings                        | Total floorspace | Floorspace per building | Total                              | Total                               |
| <b>All buildings</b>                                    | 14.7                                       | 11.4             | 12.3                    | 14.3                               | 14.5                                |
| <b>Renovations since 2000 (more than one may apply)</b> |  |                  |                         |                                    |                                     |
| Any type of renovation                                  | 22.3                                       | 11.8             | 20.7                    | 14.1                               | 14.2                                |
| Addition or annex                                       | 64.0                                       | 15.6             | 122.7                   | 18.5                               | 18.5                                |
| Reduction in floorspace                                 | 41.0                                       | 26.2             | 75.2                    | 37.1                               | 34.4                                |
| Roof replacement  | 33.4                                       | 12.5             | 32.7                    | 15.3                               | 14.3                                |
| Interior wall reconfiguration                           | 38.1                                       | 12.6             | 41.9                    | 16.6                               | 17.6                                |
| Window replacement                                      | 39.8                                       | 20.8             | 50.5                    | 21.0                               | 21.8                                |
| HVAC equipment upgrade                                  | 28.5                                       | 12.1             | 28.1                    | 14.0                               | 13.0                                |
| Lighting upgrade  | 26.2                                       | 12.9             | 25.8                    | 14.0                               | 12.9                                |
| Electrical upgrade                                      | 31.1                                       | 17.2             | 33.3                    | 15.7                               | 14.2                                |
| Plumbing system upgrade                                 | 30.2                                       | 16.4             | 34.6                    | 15.1                               | 14.8                                |
| Insulation upgrade                                      | 50.8                                       | 24.6             | 75.7                    | 18.2                               | 21.9                                |
| Fire, safety, or security upgrade                       | 30.1                                       | 13.2             | 31.7                    | 13.5                               | 14.5                                |
| Structural upgrade                                      | 61.3                                       | 32.6             | 100.9                   | 27.3                               | 27.4                                |
| Other   | 81.4                                       | 56.6             | 156.0                   | 62.9                               | 63.9                                |
| No renovations  | 21.0                                       | 16.0             | 17.2                    | 19.5                               | 21.2                                |
| Buildings constructed 2013 or later                     | 32.9                                       | 33.9             | 24.2                    | 33.0                               | 34.7                                |
| <b>Energy sources (more than one may apply)</b>         |  |                  |                         |                                    |                                     |
| Electricity   | 14.7                                       | 11.4             | 12.3                    | 14.3                               | 14.5                                |
| Natural gas   | 18.5                                       | 12.0             | 15.8                    | 14.6                               | 14.9                                |
| Fuel oil  | 19.3                                       | 13.3             | 19.3                    | 13.2                               | 15.6                                |
| District heat   | 14.7                                       | 11.4             | 12.3                    | 14.3                               | 14.5                                |
| District chilled water                                  | 21.9                                       | 14.4             | 18.2                    | 20.0                               | 21.9                                |
| Propane   | 61.8                                       | 32.5             | 98.6                    | 30.0                               | 30.9                                |
| Solar   | 35.0                                       | 22.2             | 37.4                    | 29.3                               | 34.3                                |
| Wood, coal, and other                                   | 109.6                                      | 56.6             | 3,787.1                 | 68.2                               | 63.5                                |
| <b>Space-heating energy sources</b>                     |  |                  |                         |                                    |                                     |
| District heat   | 15.4                                       | 11.6             | 12.9                    | 14.5                               | 14.6                                |
| District heat main                                      | 15.8                                       | 12.6             | 13.9                    | 15.0                               | 15.2                                |
| District heat secondary                                 | 41.5                                       | 32.2             | 54.9                    | 32.0                               | 32.1                                |
| Other excluding district heat                           | 80.9                                       | 50.3             | 207.2                   | 53.4                               | 70.6                                |
| Buildings without heating                               | 54.9                                       | 54.9             | 0.0                     | 54.9                               | 54.9                                |

Relative standard errors (RSEs) for Table C36. Total district heat consumption and expenditures, 2018

|  | RSEs for all buildings<br>using district heat |                     |                            | RSEs for district<br>heat<br>consumption | RSEs for district<br>heat<br>expenditures |
|--|---|---------------------|----------------------------|--|---|
|  | Number of<br>buildings                        | Total<br>floorspace | Floorspace<br>per building | Total                                    | Total                                     |
| <b>All buildings</b>                                 | 14.7  | 11.4                | 12.3                       | 14.3                                     | 14.5                                      |
| <b>Primary space-heating energy source</b>           |   |                     |                            |  |   |
| Electricity  | 56.0  | 27.2                | 78.4                       | 54.2                                     | 59.1                                      |
| Natural gas  | 58.6  | 32.7                | 80.7                       | 32.7                                     | 37.0                                      |
| Fuel oil   | 0.0   | 0.0                 | 0.0                        | 0.0                                      | 0.0                                       |
| District heat  | 15.8  | 12.6                | 13.9                       | 15.0                                     | 15.2                                      |
| Propane  | 0.0   | 0.0                 | 0.0                        | 0.0                                      | 0.0                                       |
| Other sources <sup>b</sup>                           | 0.0   | 0.0                 | 0.0                        | 0.0                                      | 0.0                                       |
| <b>Cooling energy sources</b>                        |   |                     |                            |  |   |
| District heat  | 58.3  | 31.8                | 60.5                       | 38.9                                     | 32.0                                      |
| Other excluding district heat                        | 15.8  | 12.1                | 13.0                       | 15.3                                     | 15.9                                      |
| Buildings without cooling                            | 43.6  | 34.2                | 21.0                       | 45.6                                     | 44.8                                      |
| <b>Water-heating energy sources</b>                  |   |                     |                            |  |   |
| District heat  | 17.4  | 12.8                | 13.9                       | 14.7                                     | 15.0                                      |
| Other excluding district heat                        | 22.2  | 14.1                | 20.8                       | 17.8                                     | 17.5                                      |
| Buildings without water heating                      | 67.8  | 41.0                | 33.0                       | 46.4                                     | 45.2                                      |
| <b>Cooking energy sources</b>                        |   |                     |                            |  |   |
| District heat  | 43.2  | 31.8                | 53.3                       | 29.6                                     | 28.4                                      |
| Other excluding district heat                        | 21.0  | 10.6                | 19.2                       | 11.7                                     | 12.0                                      |
| Buildings without cooking                            | 17.5  | 15.8                | 15.3                       | 21.7                                     | 22.3                                      |
| <b>Energy end uses<br/>(more than one may apply)</b> |   |                     |                            |  |   |
| Buildings with space heating                         | 15.1  | 11.4                | 12.6                       | 14.3                                     | 14.5                                      |
| Buildings with cooling                               | 15.7  | 11.6                | 12.9                       | 14.7                                     | 14.9                                      |
| Buildings with water heating                         | 14.6  | 11.5                | 12.3                       | 14.3                                     | 14.5                                      |
| Buildings with cooking                               | 20.1  | 11.9                | 18.8                       | 13.3                                     | 12.3                                      |
| Buildings with manufacturing                         | 27.5  | 29.5                | 22.8                       | 38.2                                     | 50.8                                      |
| Buildings with electricity generation                | 16.0  | 12.6                | 15.4                       | 14.3                                     | 15.0                                      |
| Buildings with lighting                              | 14.7  | 11.4                | 12.3                       | 14.3                                     | 14.5                                      |
| <b>Percent of floorspace heated</b>                  |   |                     |                            |  |   |
| Not heated   | 54.9  | 54.9                | 0.0                        | 54.9                                     | 54.9                                      |
| 1% to 50%  | 39.0  | 53.0                | 46.3                       | 65.2                                     | 67.0                                      |
| 51% to 99%   | 29.9  | 19.8                | 31.8                       | 23.0                                     | 17.9                                      |
| 100%   | 17.0  | 10.7                | 13.8                       | 15.0                                     | 16.8                                      |

**Relative standard errors (RSEs) for Table C36. Total district heat consumption and expenditures, 2018**

|  | RSEs for all buildings using district heat |                  |                         | RSEs for district heat consumption | RSEs for district heat expenditures |
|--|--|------------------|-------------------------|------------------------------------|-------------------------------------|
|  | Number of buildings                        | Total floorspace | Floorspace per building | Total                              | Total                               |
| <b>All buildings</b>   | 14.7                                       | 11.4             | 12.3                    | 14.3                               | 14.5                                |
| <b>Heating equipment (more than one may apply)</b>           |  |                  |                         |                                    |                                     |
| Packaged heating units                                       | 29.7                                       | 22.6             | 32.6                    | 21.1                               | 20.6                                |
| Furnaces   | 56.0                                       | 44.6             | 52.7                    | 51.2                               | 50.7                                |
| Individual space heaters                                     | 32.4                                       | 21.0             | 33.7                    | 24.6                               | 28.7                                |
| Boilers  | 64.7                                       | 19.1             | 169.2                   | 22.4                               | 23.0                                |
| Heat pumps   | 42.1                                       | 33.7             | 56.5                    | 37.7                               | 33.4                                |
| District heat  | 15.4                                       | 11.6             | 12.9                    | 14.5                               | 14.6                                |
| Duct reheat  | 67.1                                       | 23.3             | 144.1                   | 27.2                               | 26.9                                |
| Other  | 111.5                                      | 76.6             | 12,630.8                | 74.7                               | 97.2                                |
| <b>HVAC features (more than one may apply)</b>               |  |                  |                         |                                    |                                     |
| Economizer cycle   | 16.9                                       | 11.3             | 13.2                    | 12.8                               | 13.6                                |
| Variable air volume (VAV) system                             | 22.9                                       | 14.2             | 20.8                    | 17.4                               | 18.2                                |
| Dedicated outside air system (DOAS)                          | 28.9                                       | 15.6             | 26.0                    | 19.2                               | 17.2                                |
| Demand controlled ventilation (DCV)                          | 36.1                                       | 14.9             | 35.1                    | 21.8                               | 24.3                                |
| Regular HVAC maintenance                                     | 15.6                                       | 11.8             | 12.9                    | 14.9                               | 15.0                                |
| Building automation system (BAS) controls heating or cooling | 18.5                                       | 10.2             | 16.8                    | 13.9                               | 15.3                                |
| Internet-connected or smart thermostat                       | 60.1                                       | 66.8             | 87.6                    | 67.4                               | 61.3                                |
| Programmable thermostat                                      | 51.4                                       | 31.3             | 40.5                    | 48.0                               | 38.2                                |
| <b>Water-heating equipment</b>                               |  |                  |                         |                                    |                                     |
| Centralized system   | 17.5                                       | 15.6             | 14.2                    | 18.6                               | 18.9                                |
| Distributed system   | 38.7                                       | 16.7             | 38.8                    | 18.1                               | 22.6                                |
| Combination of centralized and distributed systems           | 41.3                                       | 14.7             | 50.5                    | 18.8                               | 17.5                                |
| <b>Generation technologies (more than one may apply)</b>     |  |                  |                         |                                    |                                     |
| Reciprocating engine generators                              | 17.6                                       | 13.4             | 17.2                    | 14.6                               | 16.2                                |
| Solar panels   | 35.1                                       | 22.3             | 39.6                    | 27.9                               | 34.5                                |
| Other generation technology                                  | 39.3                                       | 28.7             | 16.1                    | 28.5                               | 33.7                                |

**Relative standard errors (RSEs) for Table C36. Total district heat consumption and expenditures, 2018**

|  | RSEs for all buildings using district heat |                  |                         | RSEs for district heat consumption | RSEs for district heat expenditures |
|--|--|------------------|-------------------------|------------------------------------|-------------------------------------|
|  | Number of buildings                        | Total floorspace | Floorspace per building | Total                              | Total                               |
| <b>All buildings</b>   | 14.7                                       | 11.4             | 12.3                    | 14.3                               | 14.5                                |
| <b>Food preparation or serving areas in non-food service buildings (more than one may apply)</b> |  |                  |                         |                                    |                                     |
| Snack bar, concession stand, or coffee shop  | 19.8                                       | 18.9             | 18.0                    | 17.3                               | 17.8                                |
| Fast food or small restaurant  | 48.1                                       | 16.7             | 70.4                    | 18.9                               | 18.3                                |
| Cafeteria or large restaurant  | 20.5                                       | 13.7             | 19.6                    | 13.4                               | 14.4                                |
| Commercial kitchen or food preparation area  | 16.4                                       | 17.5             | 15.0                    | 18.3                               | 17.7                                |
| Small kitchen area   | 28.1                                       | 19.7             | 29.5                    | 17.5                               | 19.9                                |

Data source: U.S. Energy Information Administration, Forms EIA-871A and D of the 2018 Commercial Buildings Energy Consumption Survey

Note: RSE is a measure of the reliability or precision of a survey statistic. Variability occurs in survey statistics because the different samples that could be drawn would each produce different values for the survey statistics. *Estimation of Standard Errors* and *What is a Relative Standard Error (RSE)?* contain more information on how RSEs are estimated and used. Both references can be accessed from <https://www.eia.gov/consumption/commercial/survey-background-technical-information.php>.

<sup>a</sup>Climate zones are based on ASHRAE Standard 169-2021; see <https://www.eia.gov/consumption/commercial/maps.php#defined>.

<sup>b</sup>Other sources includes wood, coal, solar, and all other energy sources.