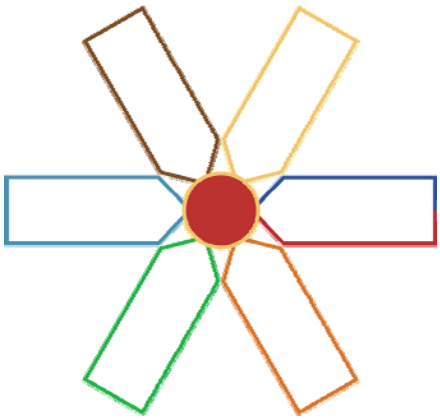

# Template for Estimating County Level Energy Use and Renewable Energy Potential

Prepared by:
6Solutions LLC
Bloomington, Minnesota

On behalf of

Agricultural Utilization Research Institute
Crookston, Minnesota

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AURI ag innovations Agricultural Utilization Research Institute

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## Contact the Authors

To contact the authors of this report, please see our website at www.6solutionsllc.com

# *Executive Summary*

Welcome to the AURI renewable energy template. This document contains instructions and data for estimating the renewable energy potential and energy demand for a county or region.

As originally conceived, the template is intended to provide an analysis of the energy potential at a county level. Much of the data needed to prepare the estimate is available based on county units and many if not most of the expected users of this template are county economic development coordinators.

During the development of the template it became clear, however, that other users including regional planners and individuals would be able to adapt this template to their own needs. Hopefully this will allow a broader use of the template and more opportunities to develop renewable energy projects.

Wherever possible the template is compartmentalized and there is no need to complete the entire template in order to obtain useful information on a specific subject. For example, a developer wishing to look into biomass availability in a single or multiple counties may choose to complete only that portion of the template relating to crop and forestry residue.

The template uses publicly available on-line data sets. These consist chiefly of Census Bureau data and Department of Agriculture databases for crop and forestry operations. The sole exception is if planners want to go into detail on industrial energy use, access to the Dunn and Bradstreet listing is required. This data set contains information on the sales, employment and NAICS code for each establishment. The James J. Hill library in St. Paul offers public access to the D&B listing without charge.

Data for energy use per square foot in commercial, educational and similar public use buildings is available from the Census Bureau. No database has been identified to estimate the commercial space in a city, county or region. Some or most of the information may be contained in the local property tax records but these are either not accessible or have limited, labor intensive access. The practical consequence of this data gap is that persons using this template will have to select a limited number of structures and use the methods provided to estimate the energy use for those specific buildings. Industrial energy use and residential energy use are estimated separately and are not affected by this limitation.

Most of the data needed to complete the template is in databases which are updated annually. Some of the data, however, is updated infrequently and can be difficult to identify and locate. Where possible, that data has been included in the Appendix and the underlying document identified so future users can look for updated data.

The template assumes a modest working knowledge of spreadsheets and database application. While the project includes a working Xcel spreadsheet showing the calculations for each portion of the template, it is also assumed that some users of the template will not have the electronic spreadsheet available to them. For those users, the worksheets are reproduced in the appendix and may be readily reconstructed based on the formulas provided. The worksheets are deliberately simple with all calculations on a single page in order to avoid data transfer errors from one sheet to the next.

In order to conveniently blend multiple resources and energy uses into a single table, all units of energy are converted to trillion Btu's per year. Conversion factors from the commonly available units to trillion Btu are provided whenever necessary.

Renewable energy resources are a new frontier for both industry and environment. Some crucial data regarding the effects of crop residue removal on soil erosion and fertility either does not exist or is in dispute. Wind farms encounter resistance based on environmental and aesthetic concerns. The mere existence of a resource should not be considered a green light until the related environmental issues are considered. Prudence would seem to argue for a balanced approach to identifying and using these resources.


Finally, this template does not address energy conservation. While energy conservation and energy reduction are rich topics for study and development, they do not, at least for now, lend themselves to economic development planning. .Estimates of energy use should naturally raise the question of how much energy use could be avoided with better equipment or alternate technologies. These applications, however, are so specific that they do not usually lend themselves to a generalized solution.

# *Introduction*

This document provides a step by step method for summarizing energy use and the renewable energy potential by geographic region, most typically a county. Following the procedures in this template will produce two tables. The first summarizes renewable energy potential in the region while the second estimates the local energy demand.

## Data Sources

The template design is necessarily limited to publicly available data in order to be universal and accessible to anyone. In some counties there are only one or two industrial users and agencies will not publish data because doing so would disclose confidential information about those companies. Overcoming those limitations requires some creativity and/or estimation. Alternately, companies may choose to cooperate in the preparation of the template and disclose more specific information.

Methods for energy use suggested in this template produce estimates which are more or less accurate depending on the methodology and accuracy of the data collected and published. Whenever better data is available as when, for example, a fuel supplier agrees to furnish data on their sales in the county, that data should be used instead.

## Timeframe

The timeframe for energy consumption and production potential template is annually.

## Units

All units used in this template are in conventional English units such as pounds, tons, and Btu's. Where data is typically provided in one form but will be entered into the table in other units, conversion factors are provided.

Conversion to a common unit is needed in order to summarize and totalize energy consumption and production. The values expressed in the summary tables will be in trillion Btu's annually. In this report, trillion is used in the American vernacular to mean $10^{12}$. A trillion is a million x a million Btu.

## Computer Skills and Calculation Methods

This template assumes a working knowledge of spreadsheets and internet skills. While the intent of the template is to provide the needed worksheets in Xcel format, it is recognized that the written text and the spreadsheets may become separated over time. To alleviate this problem, all the spreadsheets used are reproduced in the text and the appendix showing the method of calculation. This should permit a user to reconstruct any calculations using whatever method they choose.

## *Template Sections*

The template is organized broadly into five areas:

1. Data Sources
2. Renewable Energy Potential
    a. Crop Residue
    b. Animal Wastes
    c. Forest wastes and residue
    d. Wind
    e. Solar
    f. Geothermal
3. Energy Use Estimates
    a. Residential
    b. Transportation
    c. Agriculture
    d. Industrial
    e. Commercial and Office Space
4. Infrastructure Information Sources
5. Other Useful information
    a. Estimating biomass collection costs
    b. Corporate Structures
    c. State and Federal Grants and Incentives

# *Summary Tables*

Upon completion of the data collection and workup, the results of this template may be summarized in two tables showing the potential renewable energy resources and the estimated energy demand in the region.

## Renewable Energy Potential

In like manner the renewable energy potential is summarized in the format shown in the table below.

Renewable Energy Resource Template/Units as shown

**Renewable Energy Potential Summary Table**

| Resource | Quantity | Units | Energy Content |
|---|---|---|---|
| | | | Trillion Btu per year |
| Agricultural Crop Residue | | Tons | |
| Manures and Animal Wastes | | SCF | |
| Wood/woody Biomass | | Tons | |
| Wind | | kw-hr | |
| Solar | | | |
| Geothermal | | | |
| Total | | | 0 |

## Energy Use Estimate Summary

The annual energy consumption will be summarized in the format shown in the table below.

Energy Consumption Template
All units in trillion Btu per year

**Energy Use Summary Table**

| Energy Type | Residential | Transport | Agriculture | Industrial | Commercial/Public Bldg | Totals |
|---|---|---|---|---|---|---|
| All units in Trillion Btu/year | | | | | | |
| Gasoline | | | | | | 0 |
| Diesel Fuel | | | | | | 0 |
| Heating Oil | | | | | | 0 |
| Natural Gas | | | | | | 0 |
| Kerosene | | | | | | 0 |
| Coal/Coke | | | | | | 0 |
| Wood | | | | | | 0 |
| Delivered Electricity | | | | | | 0 |
| Geothermal | | | | | | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | |

## Procedures and Data Limitations

This template shows how to obtain the data and perform the calculations to fill in these two tables. The template shows where data is available and how to obtain it for no cost over the internet.

No database was found which provides an inventory of commercial and office space. According to reports from county auditors, this information is available on a per-unit basis but is not summarized anywhere in the current tax roll system. Factors for estimating the energy consumption per square foot and type of use are included in the template.

A further limitation occurs if there is a desire to go to more industry specific energy consumption. To obtain a listing of the individual firms in a region it is necessary to access the Dunn and Bradstreet database. This database may be accessed for free through the James J. Hill library but requires a party to physically go to the library to use it. Factors for using the information from the Dunn and Bradstreet report are included in the template.

## The Template is a Starting Point

The inventory of available resources is a starting point and identifies potentially under utilized resources. The existence of a resource does not necessarily mean it should be exploited and this is particularly true with respect to crop and forest residues. There is considerable controversy surrounding the sustainable level of residue removal and care must be taken not to aggravate soil erosion or other conditions that reduce the long term fertility and environment. Local experts in soil and crop management should be consulted to assure the planned uses are compatible with sustained use.

## Conservation is an Energy Alternative

This template is necessarily limited to identifying local resources and local demand. Identifying conservation techniques to reduce local energy use is not within the scope of this document but the authors recognize and encourage parties using this template to use the energy demand estimates to prompt conservation efforts.

## Data Sources and Uses

The table below summarizes the data collection required to complete this template. This listing may be used as a checklist to carry out the data gathering ahead of performing the calculations later in this template. Additional data used to carry out specific calculations are contained in the respective sections and their sources are identified there.

The column identifying intended use is provided to allow persons interested in a narrow portion of the template, for example, on-farm energy use to identify those portions of the data collection needed to calculate that portion of the template.

Sample copies of each web page are provided in the Appendix and specific excerpts from the web page are typically included in the calculation instructions for each section.

| CENSUS BUREAU DATA | | |
|---|---|---|
| Web Page Address | Description | Uses |
| http://quickfacts.census.gov/qfd/ | Opening page to US Census Bureau quick facts | Shows manufacturing shipments and wholesale sales. Used to estimate industrial energy demand. |
| hhttp://www.factfinder.census.gov/ | Entry portal to Census factfinder database | |
| Click through on "Social Characteristics" | DP-1 General Demographic Characteristics | No specific use in the template |
| Click through on "Social Characteristics" | DP-2 Selected social characteristics | No specific use in the template |
| Click through on "Economic Characteristics" | DP-3 Economic Characteristics | Total labor force and composition of the labor force by employment type.<br>Used to estimate industrial energy demand. |
| Click through on "Housing Characteristics" | DP-4 Housing Characteristics | Lists number of homes heated with each fuel type and number of homes by year of construction. This data is used to estimate residential energy demand. |

| | | |
|---|---|---|
| US DEPARTMENT OF AGRICULTURE DATA<br>Crop and Livestock Database | | |
| Web Page Address | Description | Uses |
| http://www.nass.usda.gov/Data_and_Statistics/Quick_Stats/index.asp | Opening page for access to USDA crop statistics and livestock count | |
| To access other pages in the NASS database, follow the prompts from the main page. | | |
| Crop statistics by crop and year | Lists acres planted, acres harvested and yield by year | Used to calculate potential biomass yield and on-farm energy use |
| Livestock statistics by type and year | Lists livestock head count by year for different animals | Used to calculate manure and biogas potential and energy use |

| | | |
|---|---|---|
| Department of Agriculture<br>Forestry Service | | |
| Web Page Address | Description | Uses |
| http://<br>ncrs2.fs.fed.us/4801/fiabd/rpa_tpo/wc_rpa_tpo.asp | Timber Products Output Mapmaker Version 1.0 | Access to forestry service database on forest output |
| http://ncrs2.fs.fed.us/4801/fiadb/temp2/j409502131.htm | Results table | Used to estimate the logging residue available |

| Miscellaneous Data Sources | | |
|---|---|---|
| Web Page Address | Description | Uses |
| http://www.dot.state.mn.us/roadway/data/reports/vmt.html | Access to various reports on vehicle miles traveled by county and road type | Used to estimate transportation fuel demand |
| http://www.state.mn.us/portal/mn/jsp/content.do?id=-536881350&subchannel=-536881511&sc2=null&contentid=536887066&contenttype=EDITORIAL&programid=536902421&agency=Commerce | Mn Commerce Department wind maps | Used to estimate wind resource |
| http://rredc.nrel.gov/solar/old_data/nsrdb/redbook/atlas/ | NREL Solar Energy Maps | Used to estimate solar resource |
| Dunn and Bradstreet Listing | Lists all economic entities by county | Used for detailed industrial energy use estimate |
| http://www.extension.iastate.edu/agdm/crops/pdf/a3-10.pdf | Custom farming operations cost | Used for crop residue costing |

# *Renewable Energy Potential*

## Crop Residues

This section describes how to estimate the renewable energy potential from crop residues using the U.S. Department of Agriculture crop statistics database.

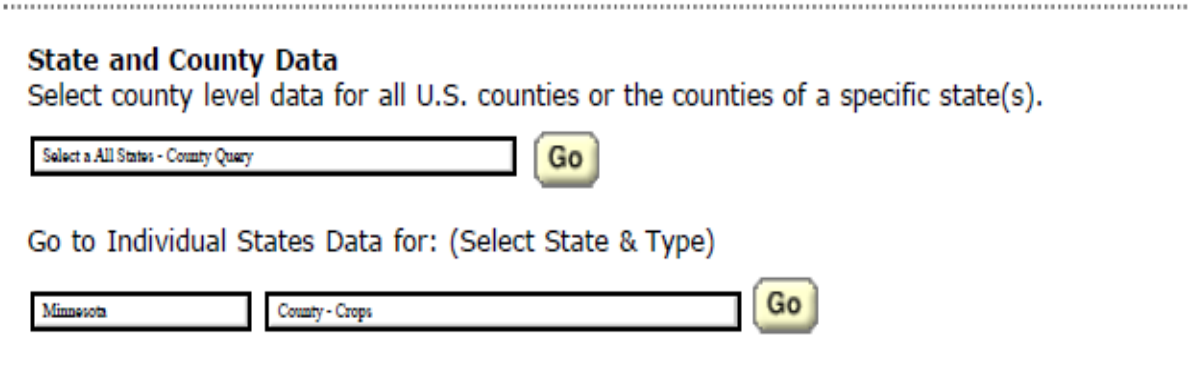
### Data Source

Data is obtained from http://www.nass.usda.gov/Data_and_Statistics/Quick_Stats/index.asp.

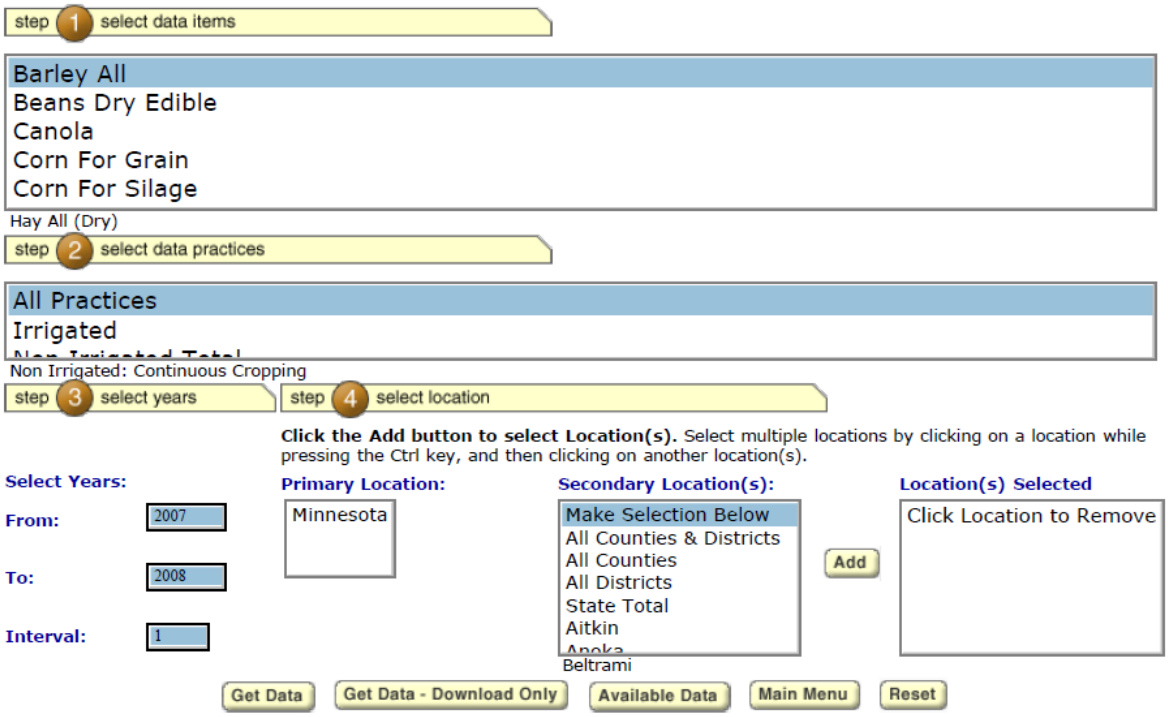
Complete sample pages from this data set are included in the appendix. Excerpts of these pages are shown for below.

### Data Selection and Collection

After accessing the database at the address above, you will be asked to select which database you want to access. Select Minnesota and county –crop data as shown below.




This will bring you to a selection screen where you will select the crop, county, and years you want to retrieve data for.




We recommend collecting at least the last 10 years of data for each crop as this will provide an indication of trends as well as scatter in the data.

When you have made your selections, you will be asked whether you want to download the data to a spreadsheet or show the data on screen. Since further calculations are required to use the data, we recommend downloading the data to a spreadsheet.

Selecting Marshall County Barley All for the period 2000 to 2008 yields the following table.

Click Header to sort column (currently sorted ascending ? ).
A CSV download option is available at the bottom of the displayed data.

Display output Control : ⊙ Units & data in the same column ⊙ Units as a separate column ⊙ Units at the bottom of table

**Minnesota County Data - Crops**

| Commodity ? | Practice | Year | State | County | District | Planted All Purposes | Harvested | Yield | Production |
|---|---|---|---|---|---|---|---|---|---|
| Barley All | Total For Crop | 2000 | Minnesota | Marshall | 10 | 49,500 acres | 46,900 acres | 64 bushel | 3,001,600 bushel |
| Barley All | Total For Crop | 2001 | Minnesota | Marshall | 10 | 28,100 acres | 27,300 acres | 56 bushel | 1,528,800 bushel |
| Barley All | Total For Crop | 2002 | Minnesota | Marshall | 10 | 38,900 acres | 35,500 acres | 41 bushel | 1,455,500 bushel |
| Barley All | Total For Crop | 2003 | Minnesota | Marshall | 10 | 41,600 acres | 39,900 acres | 81.2 bushel | 3,240,000 bushel |
| Barley All | Total For Crop | 2004 | Minnesota | Marshall | 10 | 31,100 acres | 28,500 acres | 66 bushel | 1,881,000 bushel |
| Barley All | Total For Crop | 2005 | Minnesota | Marshall | 10 | 28,300 acres | 21,500 acres | 38 bushel | 817,000 bushel |
| Barley All | Total For Crop | 2006 | Minnesota | Marshall | 10 | 23,100 acres | 20,800 acres | 61 bushel | 1,268,800 bushel |
| Barley All | Total For Crop | 2007 | Minnesota | Marshall | 10 | 32,900 acres | 30,000 acres | 58 bushel | 1,740,000 bushel |
| Barley All | Total For Crop | 2008 | Minnesota | Marshall | 10 | 28,100 acres | 26,000 acres | 72.2 bushel | 1,878,000 bushel |

9 Records displayed

Your request has been processed.
Click the 'Download CSV' Link below to download data retrieved.

Download CSV (Units as separate column within CSV) Download CSV (Units in a separate file) Download CSV (Units and data in the same column)

Note the data set returns both acres planted and acres harvested along with the average yield in bushels. Calculate the average harvested and the average yield and record that data in the crop residue summary table.

## Crop Residue Summary Table

When all the crops have been reviewed, the data is summarized in a table as shown below:

| Crop Residue Summary Table | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Column | | C | D | E | F | G | H | I | J | K | | |
| Formula | | | | | | | | =B*C*E*F*(1-G)*H | | =H*I/10^6 | | |
| Crop | Acres Harvested | Yield | Units | Bushel wgt in lbs | Removal Fraction | Moisture % | Residue to Crop Ratio | Annual Biomass Potential (lbs) | Btu content per dry lb | Million Btu/year | | |
| Barley | | | bu | 48 | 1 | 14.5% | 1.2 | 0 | 7500 | 0 | | |
| Canola | | | | 50 | 1 | 8.0% | 2.2 | 0 | 7500 | 0 | | |
| Corn Stover | | | bu | 56 | 0.5 | 15.5% | 1 | 0 | 7768 | 0 | | |
| Cotton | | | | 32 | 1 | 12.0% | 4.5 | 0 | 7500 | 0 | | |
| Dry Beans | | | | 60 | 1 | 13.0% | 1.2 | 0 | 7500 | 0 | | |
| Flaxseed | | | | 56 | 1 | 8.0% | 1.2 | 0 | 7500 | 0 | | |
| Oat Straw | | | | 32 | 1 | 14.0% | 1.3 | 0 | 7626 | 0 | | |
| Peanuts | | | | 22 | 1 | 9.9% | 1 | 0 | 7500 | 0 | | |
| Peas | | | | 60 | 1 | 9.8% | 1.5 | 0 | 7500 | 0 | | |
| Potatoes | | | | 60 | 1 | 13.3% | 0.4 | 0 | 7500 | 0 | | |
| Rice | | | | 45 | 1 | 15.0% | 1.4 | 0 | 7500 | 0 | | |
| Rye | | | | 56 | 1 | 10.0% | 1.6 | 0 | 7500 | 0 | | |
| Safflower | | | | 40 | 1 | 8.0% | 1.2 | 0 | 7500 | 0 | | |
| Sorghum | | | | 56 | 1 | 12.0% | 1.4 | 0 | 7500 | 0 | | |
| Soybeans | | | | 60 | 1 | 13.0% | 2.1 | 0 | 7500 | 0 | | |
| Sugar Cane | | | | 50 | 1 | 62.8% | 1.6 | 0 | 7500 | 0 | | |
| Sunflower | | | | 30 | 1 | 10.0% | 2.1 | 0 | 7500 | 0 | | |
| Wheat Straw | | | | 60 | 1 | 13.5% | 1.3 | 0 | 7375 | 0 | | |
| CRP and similar grassland | | 2 | tons | 2000 | 1 | 0.0% | 1 | 0 | 7500 | 0 | | |
| Brushland on 5 yr cycle | | 0.84 | tons | 2000 | 1 | 0.0% | 1 | 0 | 7500 | 0 | | |
| Total Energy Potential | | | | | | | | | | 0 | mm Btu/yr | |
| IN TRILLION BTU/year | | | | | | | | | | 0 | trillion Btu/yr | |

The calculation shown requires a judgment on the fraction of the crop residue which can be removed and still provide adequate ground cover to mitigate wind and rain erosion. This is affected by local weather, soil type and gradient. For the purpose of the initial estimate the default values inserted into the table are 100% for small grain and other crops and 50% for corn stover. These figures are provided as a starting point and should be adjusted based on local conditions such as Highly Erodible Land (HEL) or other erosion or environmental conditions.

Where crop specific data for heat content of biomass is not available, a default value of 7500 Btu per pound of dry matter has been included. As more data becomes available or if a specific crop is especially important then fuel sampling and testing is recommended.

Brushland, CRP and similar acreage figures are available through LMIC, Land Information Center. To contact your county LMIC coordinator, see the LMIC website at http://www.lmic.state.mn.us/cty_contacts.html.

For the purpose of the estimate, grasslands and CRP land has been estimated to yield 2 tons of dry matter per year. Brushland is estimated to produce 4.2 tons per acre every 5 years or 0.4 tons annually. Information on recommended grassland and brushland harvest practices is available on line at www.frc.state.mn.um.

Enter summary data of tons available and energy content in the renewable energy potential table.

## Animals Wastes

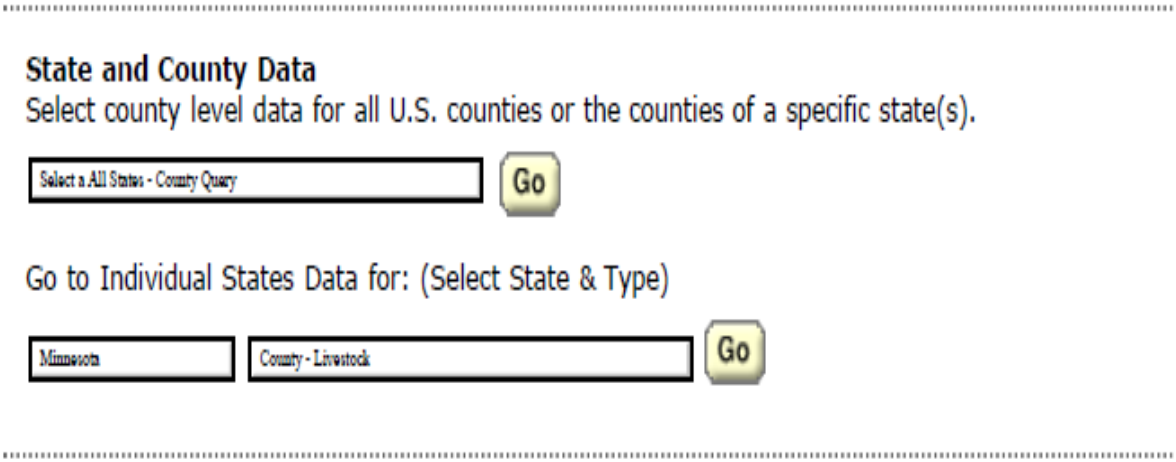
Renewable energy potential from animal wastes is estimated based on producing biogas by anaerobic digestion. Combustion of animal wastes is not usually economic due to the high moisture content and the loss of the nitrogen content is problematic. Poultry wastes are not generally good candidates for digestion due to ammonia toxicity but the calculation sheet provided contains methane yield data from NREL. Hog manure is typically too dilute to be a good candidate for methane production but may become a suitable substrate either by concentration or as part of an odor emission control program.

## Data Sources

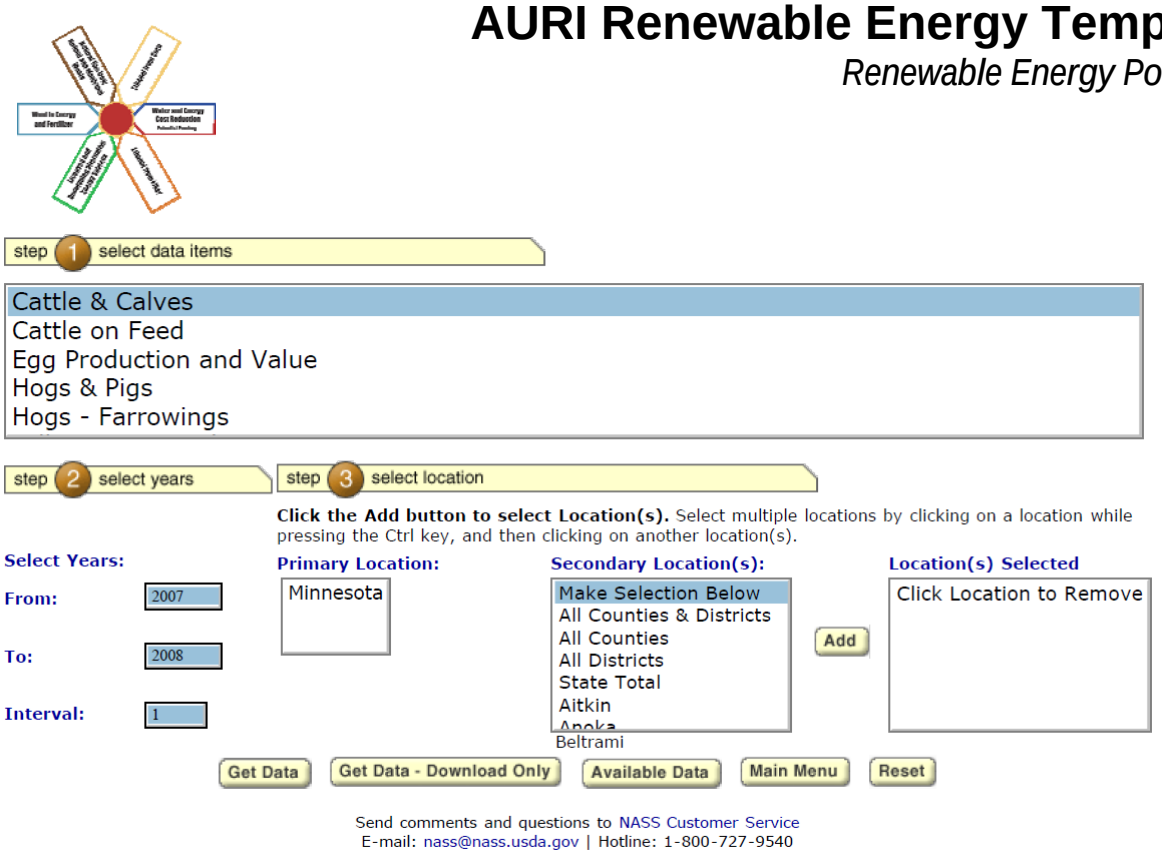
Data is obtained from http://www.nass.usda.gov/Data_and_Statistics/Quick_Stats/index.asp.

Complete sample pages from this data set are included in the appendix. Excerpts of these pages are shown for below.

Data on the methane potential for each type of animal was is taken from "A Geographic Perspective on the Current Biomass Resource Availability in the United States", A. Milbrandt, *Technical Report*/NREL/TP-560-39181, December 2005,




Select Minnesota and County-Livestock options from the selection page. This brings up the following selection page.




Select the county and livestock of interest. Data may be downloaded either to a spreadsheet or displayed on the screen. Since further calculations are required we recommend you download the data to a spreadsheet.

Selecting cattle for the period 2000 to 2008 bring down the following table.

Display output Control : ⊙ Units & data in the same column ⊙ Units as a separate column ⊙ Units at the bottom of table

**U.S. & All States County Data - Livestock**

| Commodity ? | Year | State | County | District | Cattle All | Beef Cows | Milk Cows |
|---|---|---|---|---|---|---|---|
| Cattle & Calves | 2000 | Minnesota | Marshall | 10 | 18,000 head | 6,000 head | 1,900 head |
| Cattle & Calves | 2001 | Minnesota | Marshall | 10 | 18,000 head | 6,100 head | 1,900 head |
| Cattle & Calves | 2002 | Minnesota | Marshall | 10 | 16,000 head | 6,000 head | 1,800 head |
| Cattle & Calves | 2003 | Minnesota | Marshall | 10 | 16,000 head | 5,900 head | 1,800 head |
| Cattle & Calves | 2004 | Minnesota | Marshall | 10 | 15,500 head | 5,900 head | 600 head |
| Cattle & Calves | 2005 | Minnesota | Marshall | 10 | 16,000 head | 5,900 head | 500 head |
| Cattle & Calves | 2006 | Minnesota | Marshall | 10 | 16,000 head | 6,300 head | 500 head |
| Cattle & Calves | 2007 | Minnesota | Marshall | 10 | 16,000 head | 6,400 head | 1,300 head |
| Cattle & Calves | 2008 | Minnesota | Marshall | 10 | 17,000 head | 6,800 head | |

9 Records displayed

Your request has been processed.
Click the 'Download CSV' Link below to download data retrieved.

Download CSV (Units as separate column within CSV) Download CSV (Units in a separate file) Download CSV (Units and data in the same column)

Repeat this procedure for hogs to obtain a listing of the hog population.

## Calculation Procedures

Calculate the average animal population for each type of livestock and enter the data in the table below.

| Animal Residue Methane Potential | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Column | | B | C | D | E | F | G | H | I |
| Formula | | | | | =B*C*D | | | =E*F*G | =H*970/10^6 |
| Herd Inventory | Assumed herd composition | Animal Count | Typical Animal Mass | Volatile Solids/lb TAM | Total Vol. Solids | Vol Solids | Cu Ft Methane Yield | Methane Yield | Methane Yield |
| Enter herd or flock inventory reported by USDA in column C | | | lbs | per year | per year | % Destruction | per lb VS destroyed | cu ft/year | mm Btu/year |
| **Feedlot Beef Cattle** | **Enter total here --->** | 0 | | | | | | | |
| Steers and Heifers | 33% | 0 | 915 | 2.6 | 0 | 55% | 5.29 | 0.00 | 0.00 |
| Calves | 33% | 0 | 397 | 2.6 | 0 | 55% | 5.29 | 0.00 | 0.00 |
| Steers | | 0 | 794 | 2.6 | 0 | 55% | 5.29 | 0.00 | 0.00 |
| Heifers | | 0 | 794 | 2.6 | 0 | 55% | 5.29 | 0.00 | 0.00 |
| Cows | 33% | 0 | 1102 | 2.6 | 0 | 55% | 5.29 | 0.00 | 0.00 |
| Bulls | | 0 | 1587 | 2.6 | 0 | 55% | 5.29 | 0.00 | 0.00 |
| | | | | | | | | | |
| **Dairy Cattle** | **Enter total here --->** | 0 | | | | | | | |
| Calfs | 18% | 0 | | | | | | | |
| Heifers | 18% | 0 | 903 | 3.65 | 0 | 55% | 3.84 | 0.00 | 0.00 |
| Cows | 64% | 0 | 1345 | 3.65 | 0 | 55% | 3.84 | 0.00 | 0.00 |
| | | | | | | | | | |
| **Swine** | **Enter type below** | | | | | | | | |
| Market | | 0 | 101 | 3.1 | 0 | 65% | 7.53 | 0.00 | 0.00 |
| Breeding | | 0 | 399 | 3.1 | 0 | 65% | 5.77 | 0.00 | 0.00 |
| | | | | | | | | | |
| **Poultry** | **Enter type below** | | | | | | | | |
| Layers | | 0 | 3.5 | 4.4 | 0 | 60% | 5.45 | 0.00 | 0.00 |
| Broilers | | 0 | 1.5 | 6.2 | 0 | 60% | 4.81 | 0.00 | 0.00 |
| Turkeys | | 0 | 7.5 | 3.32 | 0 | 60% | 4.81 | 0.00 | 0.00 |
| | | | | | | | | | |
| **Sheep** | | | 154 | 3.36 | 0 | 55% | 5.77 | 0.00 | 0.00 |
| | | | | | | | | | |
| Total annual energy potential in mm Btu/year | | | | | | | | | 0.00 |
| Total annual energy potential in trillion Btu/year | | | | | | | | | 0.0 |

The composition of the dairy and beef herds is not reported by USDA. Since the size of the animals affects their manure output, it is desirable to estimate the composition of the herd. Default values for dairy and beef herds are provided in the spreadsheet. If, for example, a dairy herd raises its calves and heifers somewhere else, adjust the herd composition figures.

A full size copy of this spreadsheet is provided in the Appendix. Summarize the data as shown and enter it in the summary renewable energy potential table.

## Forest Wastes and Residues

Forest wastes arise from logging and thinning operations and have historically been left to decompose in the forest. Concern about forest fires and interest in using these residues for renewable energy has caused a re-examination of this practice. The template does not consider harvesting timber for renewable energy production because the alternative value as lumber or paper feedstock is too important to make diversion to energy desirable.

Hybrid poplar and other woody biomass crops are potential players in this area. Data on yield and heating value is best obtained from those programs.

Removing forest residues is potentially controversial and best practices are subject to debate and interpretation. Forests work on a much longer time frame than crops and there is less understanding about the issues of soil tilth and habitat associated with residue removal than with crop residue. For the purpose of this template we consulted the Forestry Service and based on their recommendations, we propose to remove only 1/3 of the forest residues each year.

Hardwoods and softwoods have energy potentials of 25 million Btu per cord and 15 million Btu per cord respectively. This difference is reflected in the calculation procedure.

### Data Sources

Data on forest residues is available from the Department of Agriculture Forest Service at http://fiatools.fs.fed.us/fido/index.html. Upon entering the database you will be states and counties may be selected but for a Minnesota county, locate Minnesota on the list and select the county or counties of interest in the box as shown.

**Minnesota** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

27001 AITKIN
27003 ANOKA
27005 BECKER
27007 BELTRAMI

On the next page select the attribute of interest which for the template is the logging residue available in cubic feet.

42 standard tables
Volume of roundwood product(cuft)
Volume of logging residue(cuft)
Volume of other removals(cuft)

Click on continue to reach the next page.

Select how you want the data presented. For the template energy estimate you will need only the breakdown by hardwood and softwood. The data set will return a large number of empty columns on some searches and the option to eliminate empty columns and rows should be used.

The database will return with a notice that the data is available and provide instructions how to retrieve the data. In cases of large searches, a significant delay may occur.

The search for logging residues for Aitkin County returned the following data table.

| Two-way table (rows and columns) | | | |
|---|---|---|---|
| | TotalMajor species group | Softwoods | Hardwoods |
| 27001 AITKIN | 8,288,260 | 1,192,243 | 7,096,017 |
| Total County code | 8,288,260 | 1,192,243 | 7,096,017 |

2/24/2009 9:50:58 AM
View comma delimited table: 1. table ncrs2.fs.fed.us/4801/fiadb/temp2/j409502111.htm

Note that the data returned is in cubic feet of residue.

## Calculations

The logging residue volume is converted to energy potential by converting the volume to cords equivalent and multiplying by heating value per cord of hardwood and softwood respectively as shown in the table below.

As noted earlier the volume is discounted to 33% of the reported available volume. This figure may be adjusted in the spreadsheet based on local conditions.

| Logging Residue Energy Estimate | | | | | | | |
|---|---|---|---|---|---|---|---|
| Column | B | C | D | E | F | G | |
| Formula | | | | =B*C/D | | =E*F | |
| Units | cu ft/year | % harvested | cubic feet/cord | cords/year | million Btu/cor | million Btu/year | |
| Hardwood | | 33% | 85 | | 25 | | |
| Softwood | | 33% | 85 | | 15 | | |
| Total energy potential million Btu/year | | | | | | 0 | |
| Energy potential in trillion Btu/year | | | | | | 0 | |

Calculate the total energy potential and enter the sum in the renewable energy potential table.

# Wind Energy Potential

Minnesota has a plentiful wind resource across much of the state. Unlike biomass and animal waste resources which are limited by source, wind resources are chiefly limited by restrictions on land use. Since these restrictions are locally determined, the template cannot provide guidance on how much of the total area of a community could be used for wind farms. A further limitation is the ability of the grid to absorb power produced. Most projects in Minnesota are currently limited by transmission capacity and the ability to develop a wind resource is severely constrained. Alternative outlets for wind power including fertilizer production and algae growth are under consideration but cannot be considered practical at this writing. The technologies and markets are evolving rapidly however and these options should continue to be considered.

## Land/Energy Density

Within the limits of the currently available technology a "rule of thumb" is that one 1.65 megawatt rated turbine can be installed per each 40 acres. Among the reasons for this limitation is required spacing between turbines to mix higher speed wind with the wind that has been slowed down by passing through the turbine. While turbine size and efficiencies will probably improve with time, the mixing distance seems likely to remain close to this value indefinitely.

## Effects of Height

In general, wind speeds and available energy are higher at higher altitudes. The usefulness of low altitude, single homeowner is limited by low speed winds close to the ground. Some systems have been built by individuals either to offset part of their energy use or to supply power to off-grid locations.

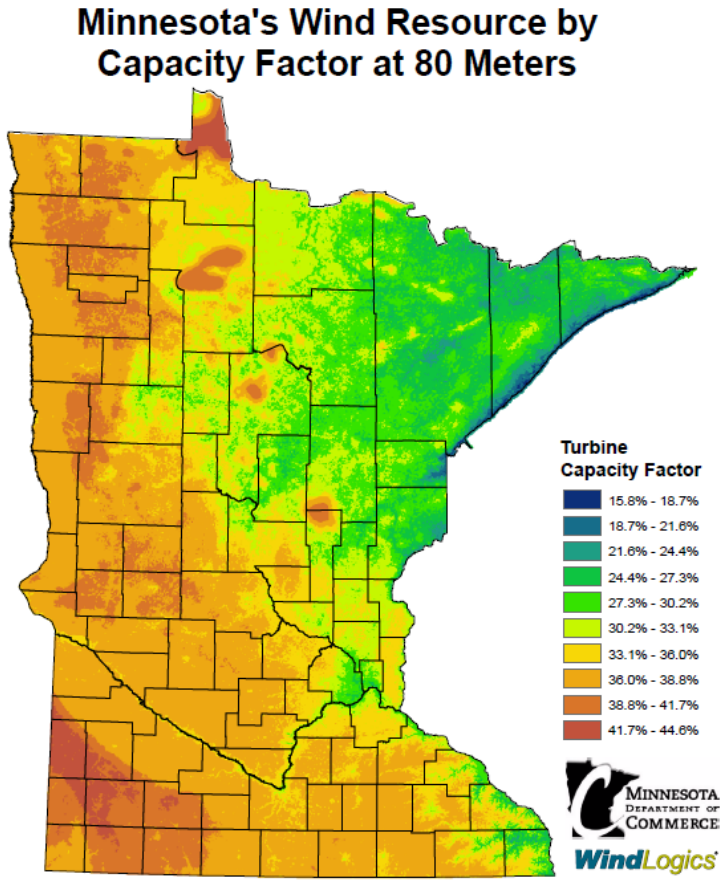
## Capacity Factors

A turbine rated for 1 megawatt almost never operates at that output because the wind velocity is not constant at the design rate. The capacity factor is the per cent of the nominal annual potential output of a turbine operating at design rate for 8760 hours which is actually achieved. The capacity factor is turbine specific and height specific. Nevertheless, capacity factors provide a good qualitative indication of a region's wind resource. Capacity factor maps provide a convenient way to summarize the relative wind resource across a region.

## Minnesota Maps

The Minnesota Department of Commerce has prepared and made available wind maps for the state of Minnesota at their website http://www.state.mn.us/portal/mn/jsp/content.do?id=-536881350&subchannel=536881511&sc2=null&contentid=536887066&contenttype=EDITORIAL&programid=536902421&agency=Commerce.

A sample of the capacity factor for an 80 meter, 1.65 megawatt wind turbine is shown below.




## Calculations

To calculate the wind potential in a given area begin by estimating the total land area available for wind development based on local zoning and environmental considerations.

Multiply this area by the wind turbine density of 1.65 MW per 40 acres and then by the capacity factor for the region based on the map above.

| Wind Energy Estimate | | | | |
|---|---|---|---|---|
| Line | | | | Formula |
| A | County area is acres | | | |
| B | % available for wind development | | acres | |
| C | Acres available for development | | | =A*B |
| | | | | |
| D | Turbine size | 1.65 | MW | |
| E | Acres per unit | 40 | | |
| F | MW installed per acre | 0.04125 | MW/acre | =D/E |
| | | | | |
| G | Capacity factor | | | |
| H | Annual hours | 8760 | hours/year | |
| | | | | |
| I | MW hours per year | | | =C*F*G*H |
| J | Trillion Btu/year | | | =I*3.412/10^6 |

### Caution

The calculation method described above is a very crude estimate of the wind energy potential. To further evaluate the potential a wind analysis and economic analysis is required. Consult experts in the field for guidance.

## Solar Energy Potential

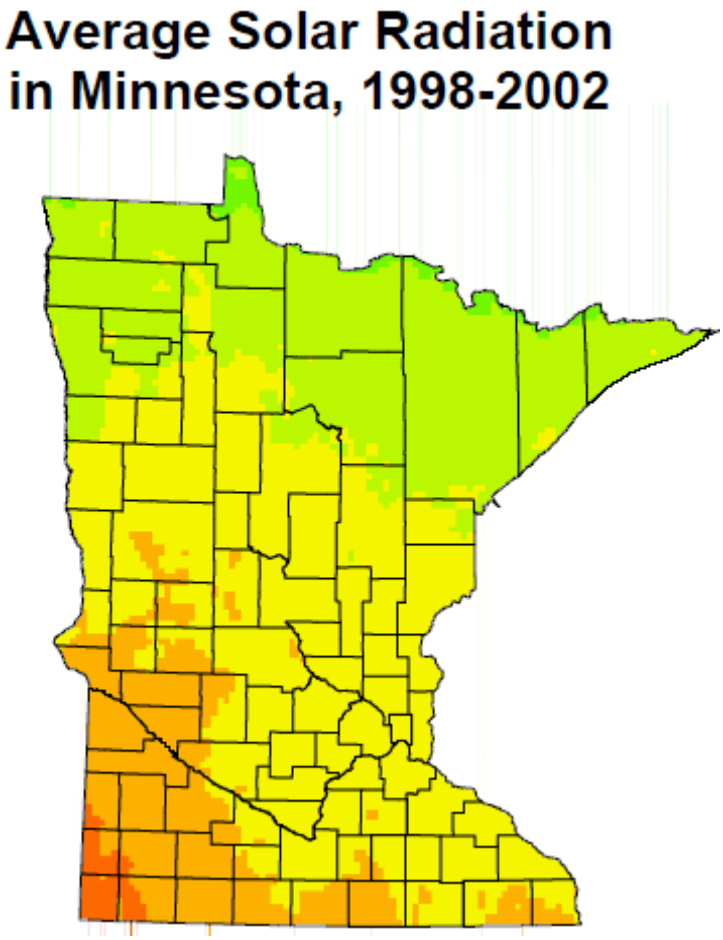
The total solar energy flux annually is a staggering sum and only 0.2% of the solar energy striking the continental United States would be required to supply the entire 102 quadrillion Btu used annually. Unlike wind or biomass sources, however, solar energy is not usually exportable. The significance of this for the user of this template is that when estimating the renewable energy potential for a region, the solar component is limited by the demand and applications for solar energy rather than the supply.

Solar energy may be collected either by photovoltaic cells as electricity or as thermal energy. At this writing photovoltaic cells are prohibitively expensive and find application only where the high cost of the cells does not determine their economic viability. Thermal energy capture, however, finds application under present conditions. Thermal solar applications are legitimately renewable energy production but the energy collected cannot be economically transported away from the site. Therefore, the chief limitation on solar energy production is matching it to a co-located demand.

## Solar Intensity

The solar resource may be characterized either by its intensity or by the annual flux. In addition, the solar resource varies with season and with method of collection.

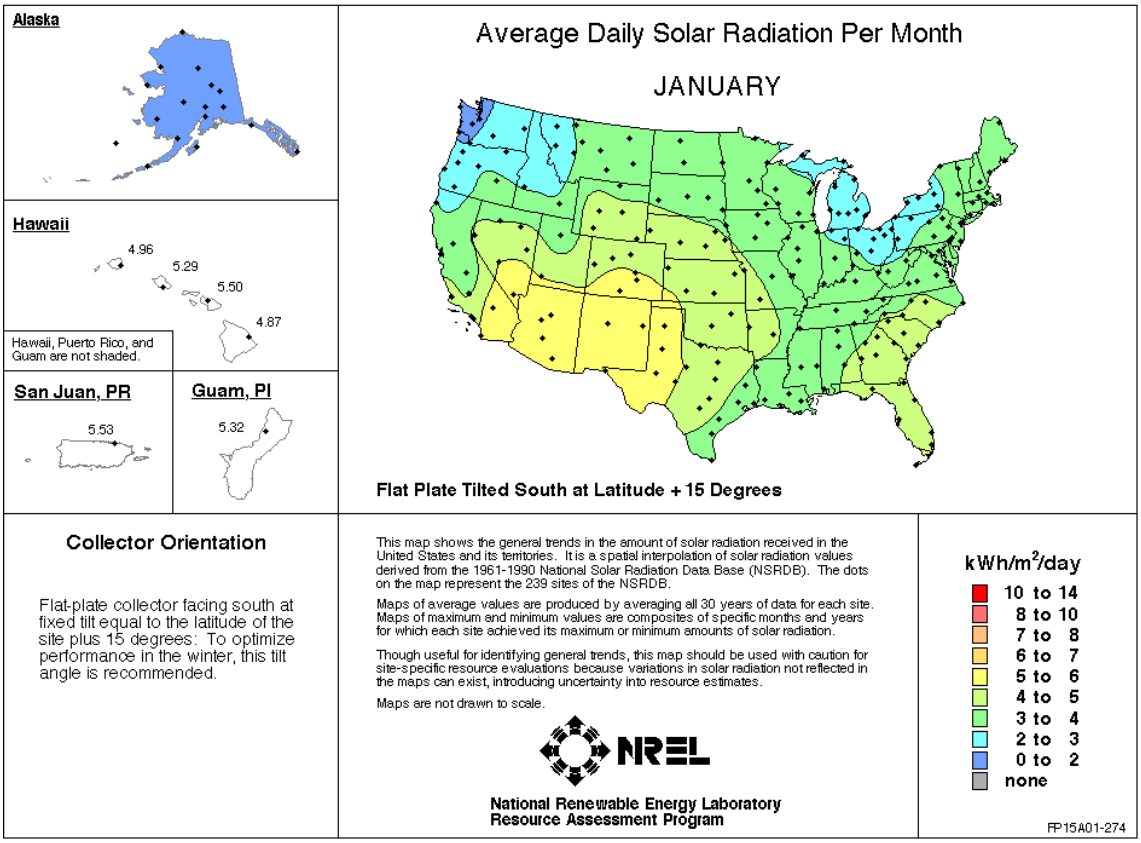
Minnesota average solar radiation intensity has been mapped by the Minnesota Department of Commerce as shown in the map below for the period 1998 to 2002. The reported inter-year variability is about 15%. The northern tier of counties has a solar intensity of around 135 watts per square meter while the southwest counties have a solar intensity around 160 watts per square meter. These values are useful for estimating photovoltaic potential.




## Solar Thermal Potential

NREL provides maps of the daily solar thermal potential by month at http://rredc.nrel.gov/solar/old_data/nsrdb/redbook/atlas/

The map for January is shown below.




Collector orientation affects the total available solar radiation. A flat plate at an angle of the latitude plus 15 degrees is the most efficient for winter operation. Since our primary interest is in heating, this is the most appropriate angle for Minnesota.

Minnesota falls in the region of 3 to 4 kWh per square meter per day. Translated to English units this amounts to about 1000 Btu per square foot per day.

## Collector Efficiency

Solar thermal collectors typically have energy efficiency on the order of 60%. This efficiency limitation is related to the operating temperature of the system and declines sharply as the operating temperature increases. The solar capacity figures above should be discounted by this factor when estimating solar potential.

### Estimating the Renewable Energy Potential from Solar

The most pragmatic approach to estimating the solar energy contribution appears to be as displacement of home or commercial space heating. Methods for estimating these energy demands are presented later in this template. To include solar thermal in the renewable energy potential table we recommend setting a goal of displacing a fraction of this energy use by solar energy and entering this value in the renewable energy potential table.

## Geothermal/Earth Energy Systems

Geothermal and earth energy systems are frequently used interchangeably to describe extraction of heat energy from the ground. In general use, the term geothermal is associated with high temperature subsurface steam or hot water generation near volcanic activity while an earth energy system is associated with heat pumps. For Minnesota the term Earth Energy System or EES is more appropriate.

### How does it Work?

An EES is analogous to a refrigerator. In a refrigerator, heat is extracted from the inside of the box and rejected to the outside air by a heat pump. An EES works on the same principle extracting heat from the ground and rejecting it into the building space. When operating as a cooling system, the EES reverses the roles of the building and the earth. The building becomes the inside of the refrigerator and the ground becomes the heat sink. Heat pumps are of interest because they move several times more energy from one place to the other than the energy used to operate the system. It is important to realize, however, that a heat pump does not create energy but rather simply moves it from one place to another.

An EES can displace energy consumption but cannot produce energy for export. As with solar thermal systems, the renewable energy potential is based on the energy use displaced not on the basis of what could theoretically be available.

## Coefficient of Performance

The ratio of the energy moved to the energy used is the coefficient of performance. A high coefficient of performance means that large quantities of energy are swung in and out of the building space while using less energy to make the movement happen. While the theoretical coefficient of performance may be as high as 14, commercial heat pump systems have coefficients from 3 to 6.

## Ground Coil vs. Direct Expansion

Ground coil and direct expansion systems are commonly used to extract heat from the ground. In a ground coil system water/glycol mixtures circulate through a pattern of plastic pipes buried in the ground. This loop typically operates at temperatures only slightly below the earth temperature and has limited heat transfer driving force. As a result, the systems are large and the circulating pump must move a lot of fluid. The heat pump extracts energy from the circulating glycol system and transfers it to the building space.

A direct expansion system pipes the refrigerant into pipes buried in the ground, usually in vertical shafts. Because there is not an intermediate loop, the direct expansion system operates at lower temperatures in the ground which enables it to extract heat from a smaller area. The refrigerant moves under its own pressure gradient and there is no need for a circulating pump.

Direct expansion systems report a higher COP than ground coil systems but that has not been independently verified.

## Net Energy

Whether an EES is a net benefit is highly equipment and installation specific. As noted, a heat pump moves energy around but does not create or store it. Power generation is about 35% efficient and a heat pump system must have a COP of 2.9 or greater just to break even on energy use. Assessing the potential benefits of EES in a particular community, therefore, must take into consideration the source and efficiency of power generation as well as the performance of the EES itself. The following calculation shows how to evaluate the net energy benefit of an EES.

| | |
|---|---|
| Calculation basis: | 1,000 Btu delivered to the occupied space |
| Coefficient of performance based on manufacturer data | 5 |
| Energy used by the heat pump | =1000/5 = 200 Btu |
| Generation and transmission efficiency | 35% |
| Energy used for generation and transmission | =200/.35 = 571 Btu |
| Overall energy savings delivered to the occupied space | =1000 -571 = 429 Btu |

If the COP of the system were 3.0, the energy used would increase to 952 Btu and the net savings would be only 48 Btu.

## Estimating Renewable Energy Potential for EES

As with solar energy, the most pragmatic method to estimate the renewable energy potential from earth energy systems is as a displacement of the energy used to heat and cool building space. Based on the demand estimate for building space later in this template, choose a goal to displace and enter this value in the renewable energy potential table.

# *Energy Use Estimates*

The renewable energy potential identified in the previous sections may be used in several different ways. One highly beneficial way to use local energy is to meet local energy demand. Identifying local energy use can guide technology selection to the option that best fits the local resource to the local demand. As noted in the sections on solar and earth energy systems, the local demand creates the opportunity for application of these technologies. All of these estimates are annualized energy use, sizing for peak hourly or daily demand is not within the scope of these estimates.

## Residential Energy Use

Estimates of the total energy consumption and consumption by fuel type may be made using the data available in two ways.

### Total Household Energy Method

When all the homes in a census region using all different fuel types are aggregated, the Census Bureau calculates the average energy consumption per household. This value can be used to provide a quick, simple estimate of residential energy consumption.

## Total Household Energy Estimate Method

The example below shows the calculation based on Marshall County with 4,791 households from Census Bureau DP-4 Profile of Select House Characteristics. Energy consumption per household is taken from Table CE1-10c from the Census Bureau statistics on home energy consumption.

| Estimated Residential Energy Consumption by Household Number Method | | | |
|---|---|---|---|
| Total number of households | 4791 | Enter from census QuickFacts | |
| | | | |
| Energy Type | million Btu per household per year | Annual Energy Million Btu per year | On Site |
| Electricity - Primary | 111.5 | 534,197 | |
| Electricity - Site | 37.3 | 178,704 | 178,704 |
| Natural Gas | 85.0 | 407,235 | 407,235 |
| Fuel Oil | 75.4 | 361,241 | 361,241 |
| Kerosene | 0.0 | - | - |
| LPG | 63.9 | 306,145 | 306,145 |
| Wood | 29.3 | 140,376 | 140,376 |
| Total | 402.4 | 1,927,898 | 1,393,702 |
| | | | |
| In Trillion Btu per year | | 1.93 | 1.39 |
| | | | |
| Data Source | | | |
| Table CE1-10c. Total Energy Consumption in U.S. Households by Midwest Census Region, 2001 | | | |

The values in the column "million Btu per household per year" are multiplied by the number of households shown in the census data to provide the energy estimate by type. Note also the column entitled "On Site". Nearly a third of the energy use attributable to household energy consumption occurs off-site at a power production plant.

## Age of Housing Stock Method

The Total Household Method is quick and easy but lacks specificity for the community in question. An alternate method of estimating household energy consumption takes into account the year when the housing stock was built. The year of construction is available in the DP-4 Profile of Selected Housing Characteristics. The energy consumption profile per household by year of construction is available from Table ce1-2c from the Census bureau.

As shown in the following table, the year of construction method provides a more detailed look at residential energy consumption and may provide a more robust test of reasonableness.

As shown below, this method gives slightly lower total energy consumption for Marshall County residential energy use but is close to the earlier number.

Energy consumption per household by year of construction is tabulated in Census Bureau table CE 1-2c shown below.

Table CE1-2c

| | 2000 | 1989 | 1979 | 1969 | 1959 | before |
|---|---|---|---|---|---|---|
| Census Data on Household Energy Consumption by Year of Construction | | | | | | |
| Electricity Primary | 130.9 | 127.9 | 97.8 | 97.2 | 85 | 85 |
| Electricity Site | 43.8 | 42.8 | 40.8 | 32.7 | 28.4 | 28.4 |
| Natural Gas | 70.9 | 64.3 | 63 | 64.6 | 72.9 | 84.3 |
| Fuel Oil | 77.8 | 91.4 | 77.3 | 68.3 | 79 | 87.5 |
| Kerosene | 21.3 | 13.5 | 23.2 | | 11.4 | 11.6 |
| LPG | 41.1 | 36.6 | 37.5 | 34.2 | 26.3 | 51.6 |
| Wood | 14.8 | 20 | 23 | 21.1 | 2706 | 48.5 |
| Total | 254.9 | 248.6 | 241.8 | 199.8 | 218.0 | 263.4 |

The housing stock and year of construction are reported in the DP-4 Profile of Housing Characteristics. The housing profile for Marshall County is extracted and shown below.

| YEAR STRUCTURE BUILT | | |
|---|---|---|
| 1999 to March 2000 | 47 | 1.0 |
| 1995 to 1998 | 175 | 3.7 |
| 1990 to 1994 | 163 | 3.4 |
| 1980 to 1989 | 474 | 9.9 |
| 1970 to 1979 | 1,102 | 23.0 |
| 1960 to 1969 | 471 | 9.8 |
| 1940 to 1959 | 799 | 16.7 |
| 1939 or earlier | 1,560 | 32.6 |

To estimate residential energy use by this method the values in table CE1-2c are multiplied by the number of houses in each age category yielding the table shown below.

| Energy Use in Million Btu per year | | | | | | | On Site |
|---|---|---|---|---|---|---|---|
| Electricity Primary | 50,397 | 60,625 | 107,776 | 45,781 | 77,663 | 132,600 | |
| Electricity Site | 16,863 | 20,287 | 44,962 | 19,217 | 26,127 | 44,304 | 171,760 |
| Natural Gas | 27,297 | 30,478 | 69,426 | 29,673 | 51,615 | 131,508 | 339,997 |
| Fuel Oil | 29,953 | 43,324 | 85,185 | 36,408 | 54,572 | 136,500 | 385,941 |
| Kerosene | 8,201 | 6,399 | 25,566 | 10,927 | - | 18,096 | 69,189 |
| LPG | 15,824 | 17,348 | 41,325 | 17,663 | 27,326 | 80,496 | 199,981 |
| Wood | 5,698 | 9,480 | 25,346 | 10,833 | 16,859 | 75,660 | 143,876 |
| Total for all households | | | | | | | 1,310,744 |
| In Trillion Btu per year | | | | | | | 1.3 |

The on-site figures may be tabulated in the energy use table.

# Transportation Energy Use

## Introduction

The transportation sector of energy demand is related to the number of vehicles in the region and to the number of vehicle miles traveled (VMT). The VMT is presumably a better indicator of the fuel consumption that actually occurs in a region because it is tied to actual vehicle operation. On the other hand, it seems reasonable that where a vehicle is registered is a good predictor of where that vehicle will be fueled. Both methods will be explained in this section.

## Composition of VMT and Transportation Fuel Efficiency

The overall transportation statistics and fuel efficiency are maintained online at http://cta.ornl.gov/data/chapter1.shtml in a document called "Transportation Energy Data Book" under the auspices of the US Department of Energy, Energy Efficiency and Renewable Energy division.

The 2006 VMT composition and vehicle type fuel efficiency is summarized in the table below for the primary users of fuel.

| Vehicle Type | % of national VMT | Gallons per year/vehicle | Miles per gallon |
|---|---|---|---|
| Passenger Cars | 55.8% | 554 | 22.4 |
| Light Trucks/Vans/SUVs | 36.1% | 612 | 18.0 |
| Single Unit Trucks | 2.7% | 4300 | 8.2 |
| Combination Trucks | 4.7% | 4300 | 5.1 |
| All others | 0.7% | | |

Gallons per year per vehicle are taken from:
Table 2.8 Motor Vehicle Mileage, Fuel Consumption, and Fuel Rates, 1949-2006 at http://www.eia.doe.gov/emeu/aer/txt/ptb0208.html.

We make the further assumption that cars and light trucks use gasoline while single unit trucks and combination trucks use diesel fuel. This will be used to convert fuel consumption in gallons into fuel consumption in Btu's.

## Vehicle Registration Method

The vehicle registration method assumes all the fuel purchase for a vehicle will occur in the region in which it is registered. Obviously that is not true but the hope would be that in aggregate, the purchases from non-residents offset purchases by residents outside the region.

To use this method we need only the vehicle registrations in the county or region by type and the annual fuel consumption by vehicle type. As noted in the census portion of this template, the vehicle registrations by type are available from the Department of Motor Vehicles.

## Example Registered Vehicle Fuel Consumption Estimate

| Estimated Fuel Consumption Per Year Based on Vehicle Registration | | | | |
|---|---|---|---|---|
| | | | | |
| County Name | Cars | Light Trucks | Heavy Trucks | |
| Beltrami County | 19,714 | 8,973 | 1,560 | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| Total | 19714 | 8973 | 1560 | |
| Annual fuel use per vehicle | 554 | 612 | 4300 | gallons |
| Btu per gallon LHV at 60F | 116,090 | 116,090 | 129,060 | Btu/gallon |
| Total energy per year | 1,267,883 | 637,505 | 865,734 | Million Btu/yr |
| | | | | |
| Annual Energy in Trillion Btu | | | | |
| Gasoline | 1.91 | trillion Btu/year | | |
| Diesel | 0.87 | trillion Btu/year | | |

## Vehicle Miles Traveled Method

The VMT method of estimating fuel consumption assumes the composition of vehicle miles traveled in the region is approximately the same as the national average.

As noted in the census section of this template the VMT by county are available on the Minnesota Department of transportation website. A copy of the printout by county and road type is included in the Appendix. Results for Aitkin County are shown in below.

| Road type | Average Vehicle Miles per day | Total Vehicle Miles per year |
|---|---|---|
| BT – Bituminous | 654,423 | 238,864,395 |
| CN – Concrete | 269 | 98,185 |
| DT – Dirt | 6,404 | 2,337,460 |
| Total | | 241,300,040 |

Multiplying the total annual mileage by the per cent of car, light truck and heavy truck yields the table below.

| Annual Fuel Consumption Estimate Based on VMT by County. | | | | |
|---|---|---|---|---|
| | Annual Vehicle Miles Traveled | | | |
| County Name | Bituminous | Concrete | Dirt | Total |
| Aitkin County | 238,864,395 | 98,185 | 2,337,460 | 241,300,040 |
| | | | | - |
| Total VMT in Region | | | | 241,300,040 |
| | | | | |
| Composition of VMT | % of VMT | Miles Traveled | Mileage | Annual Fuel Use in Gallons |
| Passenger Cars | 55.8% | 134,645,422 | 22.4 | 6,010,956 |
| Light Trucks/SUV | 36.1% | 87,109,314 | 18 | 4,839,406 |
| Single Unit Trucks | 2.7% | 6,515,101 | 8.2 | 794,525 |
| Combination Trucks | 4.7% | 11,341,102 | 5.1 | 2,223,745 |
| Total | 99.3% | 239,610,940 | | |
| | | | | |
| Convert Fuel Use to Btu's | Gallons per year | LHV Btu/gallon | Btu/year | Trillion Btu/yr |
| Gasoline Cars & Light Trucks | 10,850,363 | 116,090 | 1.25962E+12 | 1.26 |
| Diesel Single Unit & Combined. | 3,018,270 | 129,060 | 3.89538E+11 | 0.39 |

The estimated transportation fuel use in trillion Btu per year is tabulated in the summary energy use table.

# Agricultural On-Farm Energy Use

## Introduction

On-farm energy use refers to the energy actually used on the farm to plant and harvest crops, dry corn for storage and raise livestock. This does not include the energy used to manufacture fertilizers which is a separate and substantial figure.

On-farm energy use has been studied by Douglas Tiffany and Dwight Aakre in the context of the Kyoto Accords and the potential effects of this accord on farming. Douglas G. Tiffany is a Research Fellow in the Department of Applied Economics at the University of Minnesota. Dwight Aakre is a Farm Management Specialist in the Department of Agricultural Economics at North Dakota State University. The results of their studies are presented in three papers:

Minnesota Farm Energy Use and the Kyoto Accord
By Douglas G. Tiffany and Dwight Aakre, May 13, 1999

North Dakota Farm Energy Use and the Kyoto Accord
By Douglas G. Tiffany and Dwight Aakre, May 13, 1999

South Dakota Farm Energy Use and the Kyoto Accord
By Douglas G. Tiffany and Dwight Aakre, May 13, 1999

In each paper are estimates of the energy used to plant and harvest various crops. These estimates are consolidated into the table below. Where data for the exact crop was not available, the closest similar crop was inserted into the table. Also note that dairy energy use is per hundred weight (cwt) of milk produced and not per animal.

## On-Farm Energy Use by Crop and Livestock Type

| | | Energy Input per Unit | | | | |
|---|---|---|---|---|---|---|
| Commodity | Acres | Diesel | Gasoline | LP Gas | Electric | Unit |
| | | gallons | gallons | gallons | kW-hr | |
| Barley All | | 7.24 | 0.89 | 0.82 | 29.88 | acre |
| Beans Dry Edible | | 5.19 | 0.64 | 0.35 | 12.75 | acre |
| Canola | | 4.5 | 0.75 | 0 | 26.8 | acre |
| Corn for Grain | 100,000 | 8 | 1.15 | 9.58 | 35.63 | acre |
| Corn for Silage | | 9.37 | 1.15 | | | acre |
| Flaxseed | | 7.24 | 0.89 | 0.82 | 29.88 | acre |
| Green Peas for Processing | | 5.19 | 0.64 | 0.35 | 12.75 | acre |
| Hay Alfalfa (Dry) | | 9.8 | 0.81 | 0 | 32.73 | acre |
| Hay All | | 9.8 | 0.81 | 0 | 32.73 | acre |
| Hay Other (Dry) | | 9.8 | 0.81 | 0 | 32.73 | acre |
| Oats | | 7.24 | 0.89 | 0.82 | 29.88 | acre |
| Potatoes Dry Land | | 24.18 | 2 | 0 | 170.73 | acre |
| Potatoes Irrigated | | 48.89 | 2 | 0 | 345.38 | acre |
| Rye | | 7.24 | 0.89 | 0.82 | 29.88 | acre |
| Soybeans | | 7.43 | 0.91 | 0.75 | 27.5 | acre |
| Sugarbeets | | 40.33 | 2 | 0 | 100.75 | acre |
| Sunflower All | | 7.18 | 0.88 | 1.87 | 40.75 | acre |
| Sunflower Seed for Oil | | 5.7 | 1 | 2 | 30.72 | acre |
| Sunflower Seed Non-Oil Uses | | 5.7 | 1 | 2 | 30.72 | acre |
| Sweet Corn for Processing | | 7.99 | 0.98 | 0 | 0 | acre |
| Wheat All | | 7.24 | 0.89 | 0.82 | 29.88 | acre |
| Wheat Durum | | 7.24 | 0.89 | 0.82 | 29.88 | acre |
| Wheat Other Spring | | 7.24 | 0.89 | 0.82 | 29.88 | acre |

| | | | | | | |
|---|---|---|---|---|---|---|
| Winter Wheat All | | 7.24 | 0.89 | 0.82 | 29.88 | acre |
| | Head count | | | | | |
| Dairy | | 0.13 | 0.02 | 0.11 | 4 | cwt |
| Swine Farrow | | 9.05 | 1.11 | 4.06 | 148.25 | litter |
| Beef Calf | | 6.07 | 0.74 | 1.62 | 59.25 | head |
| Beef Cattle | | 3.78 | 0.46 | 1.08 | 39.38 | head |
| Turkeys | | 0.09 | 0.01 | 0.5 | 1.24 | head |

These figures can be combined with the crop and animal census prepared in the agricultural census to estimate the on-farm energy consumption as shown in the table below and converted to trillion Btu per year.

The example below shows the calculation assuming 100,000 acres of corn for grain.

# AURI Renewable Energy Template

*Energy Use Estimates*

| | Energy Input per Unit | | | | | | Annual Energy Use | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Commodity | Acres | Diesel | Gasoline | LP Gas | Electric | Unit | Diesel | Gasoline | LP Gas | Electric |
| | | gallons | gallons | gallons | kW-hr | | gallons | gallons | gallons | kW-hr |
| Barley All | | 7.24 | 0.89 | 0.82 | 29.88 | acre | - | - | - | - |
| Beans Dry Edible | | 5.19 | 0.64 | 0.35 | 12.75 | acre | - | - | - | - |
| Canola | | 4.5 | 0.75 | 0 | 26.8 | acre | - | - | - | - |
| Corn for Grain | 100,000 | 8 | 1.15 | 9.58 | 35.63 | acre | 800,000 | 115,000 | 958,000 | 3,563,000 |
| Corn for Silage | | 9.37 | 1.15 | | | acre | - | - | - | - |
| Flaxseed | | 7.24 | 0.89 | 0.82 | 29.88 | acre | - | - | - | - |
| Green Peas for Processing | | 5.19 | 0.64 | 0.35 | 12.75 | acre | - | - | - | - |
| Hay Alfalfa (Dry) | | 9.8 | 0.81 | 0 | 32.73 | acre | - | - | - | - |
| Hay All | | 9.8 | 0.81 | 0 | 32.73 | acre | - | - | - | - |
| Hay Other (Dry) | | 9.8 | 0.81 | 0 | 32.73 | acre | - | - | - | - |
| Oats | | 7.24 | 0.89 | 0.82 | 29.88 | acre | - | - | - | - |
| Potatoes Dry Land | | 24.18 | 2 | 0 | 170.73 | acre | - | - | - | - |
| Potatoes Irrigated | | 48.89 | 2 | 0 | 345.38 | acre | - | - | - | - |
| Rye | | 7.24 | 0.89 | 0.82 | 29.88 | acre | - | - | - | - |
| Soybeans | | 7.43 | 0.91 | 0.75 | 27.5 | acre | - | - | - | - |
| Sugarbeets | | 40.33 | 2 | 0 | 100.75 | acre | - | - | - | - |
| Sunflower All | | 7.18 | 0.88 | 1.87 | 40.75 | acre | - | - | - | - |
| Sunflower Seed for Oil | | 5.7 | 1 | 2 | 30.72 | acre | - | - | - | - |
| Sunflower Seed Non-Oil Uses | | 5.7 | 1 | 2 | 30.72 | acre | - | - | - | - |
| Sweet Corn for Processing | | 7.99 | 0.98 | 0 | 0 | acre | - | - | - | - |
| Wheat All | | 7.24 | 0.89 | 0.82 | 29.88 | acre | - | - | - | - |
| Wheat Durum | | 7.24 | 0.89 | 0.82 | 29.88 | acre | - | - | - | - |
| Wheat Other Spring | | 7.24 | 0.89 | 0.82 | 29.88 | acre | - | - | - | - |
| Winter Wheat All | | 7.24 | 0.89 | 0.82 | 29.88 | acre | - | - | - | - |
| | Head count | | | | | | | | | |
| Dairy | | 0.13 | 0.02 | 0.11 | 4 | cwt | - | - | - | - |
| Swine Farrow | | 9.05 | 1.11 | 4.06 | 148.25 | litter | - | - | - | - |
| Beef Calf | | 6.07 | 0.74 | 1.62 | 59.25 | head | - | - | - | - |
| Beef Cattle | | 3.78 | 0.46 | 1.08 | 39.38 | head | - | - | - | - |
| Turkeys | | 0.09 | 0.01 | 0.5 | 1.24 | head | - | - | - | - |
| | | | | | | | | | | |
| Total Units per year | | | | | | | 800,000 | 115,000 | 958,000 | 3,563,000 |
| Conversion factor Btu/unit | | | | | | | 129,090 | 116,090 | 91,547 | 3,412 |
| Trillion Btu per year | | | | | | | 0.10 | 0.01 | 0.09 | 0.01 |

When the table above has been completed, the energy consumption by type is entered into the summary energy use table.

## Industrial Energy Use

Industrial energy demand is a potential application of renewable energy within a region. From the perspective of a regional development coordinator, identifying a local demand for energy is preferable to taking energy onto the national markets because it encourages local self-reliance and circulates money within a community. A stable, competitively priced energy supply is potentially a significant advantage for attracting or maintaining a local industry. Therefore, there is a strong interest in identifying whether a local energy demand exists to take up the energy available.

Past efforts to determine regional energy use by voluntary questionnaires have not been successful. Many companies are keenly aware of the role energy plays in their profitability and are likely to be open to alternate energy sources especially if they are available at competitive prices. At the same time, energy use is a sensitive indicator of total output and operations and as such is often a closely guarded secret of the company. Efforts to ascertain a company's interest in a renewable energy project should respect that boundary while exploring opportunities for collaboration.

### Estimating Methodology

To estimate industrial energy use requires three elements; volume, intensity and composition. Volume in this case refers to either number of employees, dollars of added value or dollars value of shipments.

In addition, volume may be company specific or aggregated into regional data. Company specific data is available through the Dunn and Bradstreet data base. The census bureau reports total manufacturing employment, employment by major industry category and total manufacturing dollar shipments by county.

## Energy Intensity Measures

Energy intensity measures energy input per a unit of output. Given the enormous diversity of the economy there is no practical common denominator to use in determining energy intensity per physical unit. Instead the Census Bureau and Energy Information Administration measures of energy intensity in three ways. These are:

Btu per employee per year

Btu per dollar added value

Btu per dollar value shipped.

This data is reported as the Manufacturing Energy Consumption Survey (MECS) in 2002. The report is updated every four years but the 2006 data is still pending. The tables are accessible at http://www.eia.doe.gov/emeu/mecs/mecs2002/data02/shelltables.html.

The elements to calculate the first and third measures are typically available to us through the Census or business data bases. In some locations the total dollar shipment value may not be available due to the preponderance of a single or limited number of employers. The number of employees in manufacturing is typically available.

## Composition of Energy Use

Different industries use energy types in varying proportions. MECS reports total energy use in trillion Btu by industry and sub-classification. This data can be translated into a proportion which can in turn be used to disaggregate total energy consumption into its parts.

## Variation by Entity Size

Energy intensity varies by entity size. In general larger firm, whether measured by employment or dollar sales, have higher energy intensities than smaller firms. MECS reports energy intensity for the three measures above according to total employment and by total shipment value.

## Variation by Region

Energy composition varies within the same industry by region. MECS provides breakdowns of total energy use by industry by region. Wherever possible, this data should be used in preference to the national averages.

## Summary of Calculation Options

The table below presents the options available for calculating industrial demand in a region from the least complex to the most complex. No approach will always be preferable and the choice among them is chiefly a function of time and effort required/available. In general, the template user is expected to proceed progressively from the least specific and least complex until satisfied with the specificity and clarity of the results. Using more than one method will also provide a sense of the range of variability of the estimates. At a minimum the first two methods should be used if volume data is available.

Testing of the template has shown the industrial energy consumption figures are widely scattered based on the method used. This appears to be an inherent limitation of the methods and data sets available.

Summary of Options for Estimating Industrial Energy Use

| Basic Entity | Volume Measure/<br>Data Source | Intensity Measure/<br>Data Source | Composition Est./<br>Data Source |
|---|---|---|---|
| County | Manufacturing Dollars Shipped<br>Census QuickFacts | US average Btu/$ GDP<br>MECS Table 1.7 | National Average<br>MECS Table 1.2 |
| County | Manufacturing Employment<br>Census FactFinder table DP-3 | Average Btu/employee<br>MECS Table 6.2<br>Midwest Region | National Average<br>MECS Table 1.2 |
| Individual Business | Dollar Sales<br>Dunn & Bradstreet | Btu/$ shipped by region and dollar volume<br>MECS Table 6.2 | By region<br>using regional totals<br>MECS Table 1.2 |
| Individual Business | Employment<br>Dunn & Bradstreet | Btu/employee<br>By region<br>and number of employees<br>MECS Table 6.2 | By Region<br>using regional totals<br>MECS Table 1.2 |
| Individual Business | NAICS Code and dollar volume<br>Dunn & Bradstreet | Btu/$ shipped by NACIS Code<br>MECS Table 6.1 | By region and by NAICS code<br>MECS Table 1.2 |
| Individual Business | NAICS Code and employment<br>Dunn & Bradstreet | Btu/employee and NACIS Code<br>MECS Table 6.1 | By region and by NAICS code<br>MECS Table 1.2 |

## Sample Calculations

***Example 1 Manufacturing Dollars Shipped Method***

Becker County had $232,014,000 in manufacturing shipments in 2002. (QuickFacts report). From Table 1.7 the total energy use per $ of GDP was 9,740 Btu. Therefore the total industrial energy budget for Becker County is estimated to be 2.25 trillion Btu per year.

Energy budget = 232,014,000 * 9,740 = 2.25 trillion ($10^{12}$)

***Example 2***

Becker County reported 2,221 people employed in manufacturing. From Table 6.2 we determine the average energy use per employee is 1,007.4 million Btu. The calculated industrial energy budget based on employment is 2.23 trillion Btu annually.

Energy budget = 2,221 * 1,007.4 *$10^{6}$ =2.23 trillion ($10^{12}$)

***Example 3 Estimating Composition of Industrial Energy Use***

To estimate the composition of the energy use in Becker County we convert the regional total energy consumption to % and then multiply the county energy use as shown in the table below.

| Energy Type | Total | Net Electricity | Natural Gas | LPG | Coal | Coke | Other |
|---|---|---|---|---|---|---|---|
| Energy use in Trillion Btu from table 1.2 | 4702 | 858 | 1588 | 164 | 676 | 261 | 1152 |
| Energy use in % | | 18% | 34% | 3% | 14% | 6% | 25% |
| Energy Use Trillion Btu/yr | 2.04 | 0.38 | 0.69 | 0.07 | 0.29 | 0.11 | 0.50 |

The obvious weakness of these gross measures is that specific energy uses such as coke may not be relevant to a particular community. These measures are most appropriate as benchmarks to guide further examination.

***Example 4 Estimating Energy Composition by NAICS code***

A more specific and detailed energy estimate may be obtained by combining the Dun and Bradstreet listing with MECS data by region and NAICS code. As a specific example, this example will show how to estimate the energy use and composition of a firm in NAICS class 336. The firm has $80,000,000 in sales annually and a total employment of 876.

This data is contained in the Dunn and Bradstreet listing of the firms in the geographic region in question. Free access to the database is available through the James J. Hill Library in St. Paul.

The Dunn and Bradstreet report contains a lot of information not needed for estimating energy consumption so it is useful to extract the NAICS code, the number of employees and total sales. Subtotal sales and employment by the first three digits of the NAICS code unless sufficient data is available or of interest for the full six digit code.

From Table 6.3 of MECS obtain energy intensity data for NAICS code 336 in the Midwest. The energy intensity values are 249.9 million Btu per employee and 1200 Btu per dollar of sales. Total energy use is estimated by both methods as shown below.

| | Volume | * Intensity | = Total Energy Use |
|---|---|---|---|
| Employment | 876 | 249.9 million Btu/employee | 218,912 million Btu/year |
| Sales | $80,000,000 | 1200 Btu/$ | 96,000 million Btu/year |

The discrepancy between the two methods provides an indication of the accuracy of the methods which are expected to become less accurate as the estimate becomes more specific.

The composition of energy use in NAICS code 336 is found in table 1.2. Table 1.2 reports total energy use for that code in the region and it is necessary to convert these totals to per cent in order to apply them to the energy use calculated above.

From Table 1.2 we find the energy composition for code 336 and calculate per cent as shown.

| Energy Type | Energy Used<br>Trillion Btu/year | % of Total | Energy Used<br>Employee Method<br>Million Btu/year | Energy Used<br>$ Sales Method<br>Million Btu/year |
|---|---|---|---|---|
| Total | 241 | 100% | 218,912 | 96,000 |
| Electricity | 94 | 39% | 85,375 | 37,440 |
| Residual Fuel Oil | - | | | |
| Distillate Fuel Oil | - | | | |
| Natural Gas | 120 | 49% | 107,266 | 47,040 |
| LPG and NGL | | | | |
| Coal | | | | |
| Coke and Breeze | | | | |
| Other | 15 | 7% | 15,324 | 6,720 |
| Unidentified | 12 | 5% | 10,945 | 4,800 |

# Commercial, Retail and Office Energy Use

## Introduction

Commercial, office and retail space is a large energy consumer. In some communities studied schools, public buildings and hospitals are among the largest users of natural gas ranking behind only large industrial users.

## Data Sources

The minimum data required to estimate commercial space energy use are the square feet of space and the energy intensity (Btu/square foot per year). Refinements may be made based on building age, use and Census region.

No generally applicable and readily available database of building area has been identified at this time. Data on building size and use is catalogued by County Assessor offices but reportedly at least some of these records are paper only.

Mitigating this shortcoming is the belief that the largest area space buildings in a typical rural community are the schools, government centers, hospitals and nursing homes. Therefore, it may be sufficient for the purpose of the template to identify the limited number of these buildings and examine ways to reduce the energy consumption of these buildings first.

Energy intensities for commercial space are reported by the Energy Information Administration in tables E1A through E11A. These tables are attached in the Appendix Data is provided based building size, building use, year constructed and by Census region. The simplest estimate is obtained based on building area and occupancy type. The following sample calculation makes the further simplification that building heating, lighting and cooling are provided by natural gas and electricity. When this is not valid, the method shown below may be used but appropriate energy intensities from the attached tables should be used.

## Sample Building Energy Use Calculation

This method consolidates information from EIA tables E6A and E7A to estimate the total electrical and natural gas consumption for buildings based on occupancy type. Sum building area by occupancy type and enter in the table in column D. Cross multiply as shown. Total columns E and F and convert to trillion Btu using factors provided.

| **Commercial Building Energy Use** | | | | | |
|---|---|---|---|---|---|
| A | *B* | *C* | D | E | F |
| Principal Bldg Activity | *kwhr/sq ft* | *thousand Btu/Sq ft* | Total Area by Use | kw-hr/yr | thousand Btu/yr |
| | | | | =D*B | =D*C |
| Education | *11* | *38.1* | | - | - |
| Food Sales | *49.4* | *51.7* | | - | - |
| Food Service | *38.4* | *145.6* | | - | - |
| Health Care | *22.9* | *95.3* | | - | - |
| Inpatient | *27.5* | *113.2* | | - | - |
| Outpatient | *16.1* | *51.8* | | - | - |
| Lodging | *13.5* | *50.4* | | - | - |
| Mercantile | *19.2* | *33.5* | | - | - |
| Retail | *14.3* | *31.9* | | - | - |
| Enclosed and Strip Malls | *22.3* | *34.4* | | - | - |
| Office | *17.3* | *32.8* | | - | - |
| Public Assembly | *12.5* | *37.5* | | - | - |
| Public Order and Safety | *15.3* | *45* | | - | - |
| Religious Worship | *4.9* | *31.2* | | - | - |
| Service | *11* | *55.8* | | - | - |
| Warehouse and Storage | *7.6* | *24.1* | | - | - |
| Other | *22.5* | *69.7* | | - | - |
| Vacant | *2.4* | *23.7* | | - | - |
| Total energy use | | | | - | - |
| Million Btu per year | | | | - | - |
| Trillion Btu/year | | | | - | - |

To convert kw-hrs per year to trillion Btu multiply the total kw-hr by $3,412 * 10^{-12}$

To convert thousand Btu per year to trillion Btu multiply the total by $1*10^{-9}$

Enter the figures in the energy use summary table.

# *Crop Residue Costing*

The cost of crop residue removal to a project is comprised of harvest and transport costs, fertilizer replacement costs and farmer profit.

The cost of crop residues harvested from biomass supply may be estimated based on the Iowa Farm Custom Survey prepared annually by the University of Iowa Extension Service available on the Internet at http://www.extension.iastate.edu/agdm/crops/pdf/a3-10.pdf. The calculations below are based on the 2008 survey.

The calculation of harvest and transport costs per 1000 pound bale assuming 4 bales per acre and a transportation distance of 20 miles is shown in the table below.

| Custom Service | Rate | Cost per 1000 lb bale at 20% moisture |
|---|---|---|
| Chopping | $9.50 per acre | $2.38 |
| Raking | $5.65 per acre | $1.41 |
| Baling | $11.20 per bale | $11.20 |
| Transport assuming 20 miles | $0.14 per mile | $2.80 |
| Total | | $17.79 |
| Cost per dry ton | | $44.48 |

To estimate the fertilizer replacement cost researchers at Iowa State recommend using the nitrogen, phosphate, and potash at current fertilizer prices. The content and current prices of these nutrients are shown in the table below.

| Nutrient | Pounds per dry ton* | Price per pound | Cost/dry ton |
|---|---|---|---|
| Nitrogen | 20 | $0.30 | $6.00 |
| Phosphate | 5.9 | $0.50 | $2.95 |
| Potash | 25.0 | $0.27 | $6.75 |
| Total | | | $15.70 |

*Data from ISU Extension publication PM-1688. Actual content will vary with species and cultivation practices.

The value of nitrogen content in corn stover is a disputed topic. Some argue removing stover reduces the amount of nitrogen fertilizer required per acre since less N is required to break down the crop residue on the field.

Finally the farmer is expected to take a profit on this activity. For purposes of estimating stover costs we assume a farmer profit of $25 per dry ton.

The expected pricing for stover or other crop residue is the sum of these three costs or $85.18 per dry ton. Since we have assumed 80% dry solids in the crop residue, the delivered cost would be $68.14 per ton as received.

# *Infrastructure Resources*

As planning for renewable energy projects progress, information on key infrastructure and support will be required. The following is a list of resources to access to gain further information on infrastructure, government agencies and vendors.

Railroads
Rail service is monitored by the Minnesota Department of Transportation. Maps of rail service and agency contacts are available at: http://www.dot.state.mn.us/ofrw/railroads.html

Natural Gas
Maps of natural gas pipelines are available by request through the National Pipeline Mapping system accessible at http://www.npms.phmsa.dot.gov/. Since the terrorist attacks of 9/11 pipeline information has become much more restricted. Working with your local natural gas distributor to identify pipeline locations and capacity is recommended.

Electricity Service Territories
Electrical service territories are mapped on http://gopher.mncee.org/BiomassFrame.html

Other Infrastructure
Other infrastructures which may be important to individual projects include:

- Ammonia storage facilities
- Other fertilizer storage facilities
- Fuel and fuel oil storage facilities
- Propane handling and storage

Contact local vendors to discuss with them what facilities might be incorporated into a renewable energy project.

# *Corporate Structures*

Organizing the legal entity to execute any plan arising from this evaluation is a critical step in bringing the plan to fruition. There are several basic types of organization which could be used. Each brings particular strengths and weaknesses to the program.

## C - Corporations

C corporations are used to finance and own most of the large companies in the United States. Corporations are created under the authority of the states, not the federal government, and are typically subject to governance rules of the state in which they are incorporated. The C designation is related to the portion of the federal tax code (Subchapter C) under which the corporations are taxed. The chief advantage of a C corporation is the ability to raise large sums of money in the equity markets while limiting liability to the amount of money invested. The chief disadvantage of C corporations is double taxation. Federal tax on C-corporations is around 35% and when those earnings are passed on to owners, the dividend income may be taxable again.

## S – Corporations

S corporations are corporations under state law and have the same liability limitations available to C – corporations. The chief distinctions from C-corps lie in the manner of taxation and the limitations on stock ownership. S-corporations cannot have more than 100 shareholders and they must all be real persons, not other corporations. (Some exceptions exist for certain non-profit organizations.) Earnings and losses are passed through to the shareholders on the basis of their ownership in the corporation regardless of whether or not dividends are actually paid. This has the potential to create a cash flow problem when the corporation earns money but retains earnings to fund on-going operations.

## LLC Limited Liability Corporations

A Limited Liability Company (LLC) is a relatively new business structure allowed by state statute.

LLC's have gained popularity as a corporate organization because like corporations they limit personal liability for debts and actions of the corporation while allowing certain benefits of partnerships. For example, LLC's are not taxed and benefit from pass-through taxation rules. Owners are called members not stockholders and ownership is not usually limited to individuals but may include corporations, other LLC's and foreign entities. Like a C-corporation, there is no limit on the number of members. LLC's also have operational benefits spelled out in members agreements that describe how the firm will be governed which is not necessarily tied to stock ownership.

## Co-operatives

Co-operatives have a long history in the Midwest as a vehicle for funding joint operations particularly farming support organizations. Most of the ethanol plants in Minnesota started as co-operatives though some have subsequently been converted to corporations.

The chief operational distinction of co-operatives from corporations is in corporate governance. Co-operatives operate on a one-man one-vote principle while corporations grant voting rights based on shares owned and stock classes.

While cooperatives are frequently associated with smaller, communal activities, the structure is not limiting. The rise of several very large agricultural cooperatives in Minnesota and elsewhere demonstrates that cooperative organizations have not been limited with regard to the amount of money raised or the size of the organization.

## C-BED

Community based energy development projects are unique to Minnesota and reflect an interest in the legislature to retain the benefits of renewable energy development in the communities where the resource is based. At present the legislation applies primarily to wind energy projects but the concept is clearly flexible enough to accommodate projects such as this. No language in the legislation clearly limits the structure to wind projects.

The four outstanding aspects of a C-BED project are

Qualifying owners must be local. The project ownership is limited to a jurisdiction but may include individuals, non-profits, cooperatives, local government entities and tribal councils.

No single owner may own more than 15 per cent of the project though for very small projects, a single owner may own the entire project.

A C-BED project needs a local resolution of support from the local governing body, the county board for example.

The utilities are required to negotiate in good faith to establish a tariff for power purchase and that tariff must use a front end loaded approach that allows the C-BED to pay off the debt service of the project in the early years.

Biomethane projects are not included in the current scope of existing C-BED regulations but if interest were great enough, the legislature could be approached to incorporate changes to make biomethane more feasible.

# *Tax Credits and Federal Renewable Energy Incentives*

## Central Database of Incentives

The central clearing point for information on renewable energy incentives is www.dsireusa.org. On this web page you can access federal and state incentives for renewable energy.

Some of the outstanding credits which should be examined include:

## Section 45K Tax Credits

Section 45K of the Internal Revenue Code provides a tax credit for the sale to an unrelated person of qualified fuels produced by the taxpayer in the United States from specified non-conventional sources. The formula for calculating the tax credit is indexed to oil and gas prices and uses a complex formula based on inflation to arrive at the tax credit annually. According to www.lfgtech.com/section%2045k.htm the credit in 2007 was $1.2758 per million Btu. President Bush's 2001 Energy Policy statement advocated extension of this credit past its current 2008 expiration but no further information was found as to the fate of this credit.

## Alternative Fuel Excise Tax Credit

An excise tax credit is available for alternative fuel that is sold or used as a fuel to operate a motor vehicle. This would include, for example, a compressed natural gas (CNG) fueled vehicle. As noted in the earlier discussion of natural gas markets, CNG represents a growing application for natural gas particularly for urban fleet applications.

The credit is $0.50 per gallon of gasoline equivalent (GGE) on the basis of a gallon of gasoline having a heating value of 116,000 Btu per gallon. This would put the value of this tax credit at $4.31 per million Btu.

This credit is available until September 30, 2009 when it is currently set to expire. For more information consult IRS Notice 2006-92 or US tax code 26 U.S. Code § 6427.

## Renewable Energy Production Incentive (REPI)

REPI provides incentive payments under 42 USC 13317 for electricity produced from renewable resources including biomass and livestock methane. The incentive is 1.5 ¢ per kWh in 1993 dollars and indexed for inflation.

There are sharp limits on eligibility for this program. Eligible facilities include not-for-profit electric cooperatives, public utilities, state governments, Commonwealths, territories, possessions of the United States, the District of Columbia, Indian tribal governments and their associated corporations and divisions.

If sufficient funds to completely pay the applicants for the incentive, the legislation provides that 60% of the funding available would go to solar, wind, ocean, geothermal and closed loop biomass .The payment is subject to annual appropriation and a review of projects collecting funds under this program in 2006 shows that all of the projects in Minnesota are wind projects and that the actual payment was 0.49 cents per kWh. This suggests that the program is over-subscribed relative to its appropriation.

For more information on this program consult www.eere.energy.gov/repi.

## Renewable Electricity Production Tax Credit (PTC)

The federal PTC is a per-kilowatt-hour tax credit for electricity generated by qualified energy resources and sold by the taxpayer to an unrelated person during the taxable year. The federal PTC was originally enacted in 1992, allowed to expire in 2001 before being re-enacted in 2002. The tax credit expired again in 2003 and was re-enacted in 2004 and then extended in 2005 and again in 2006. The PTC is currently set to expire on December 31, 2008.

During its checkered past, the PTC has expanded the scope of projects covered by it to include a number of sources including specifically, open-loop biomass. While closed-loop projects are eligible for 2.0¢ per kWh, open-loop systems are only eligible for 1.0¢.

Assuming a facility using biomethane has a heat rate of approximately 6500 Btu/kWh, this incentive would be worth about $1.53 per million Btu.

For more information, consult www.irs.gov/pub/irs-pdf/f8835.pdf.

## H.R. 2810 Amendment to Production Tax Credit

In June, 2007 Representative Jefferson of Louisiana introduced legislation to put biomethane production on an equal basis with electricity production. Under the proposed legislation, biomethane would be eligible for 1.5¢ per 3412 Btu. This computes to a tax credit of $4.39 per million Btu.

A similar bill titled “Biogas Production Incentive Act of 2009” would provide a federal incentive of $4.27 per million Btu. The bill is currently in committee.

## Green House Gas Credits

In the absence of a formal cap and trade policy, green house gas credits are traded in the United States on a voluntary basis. At present these credits are worth about $6 per ton of carbon dioxide emission avoided. Burning 1 million Btu of natural as produces 116 lbs of carbon dioxide. This puts the value of green house credits in the current market at about 36¢ per million Btu. Since the new administration has called for cap and trade limits on carbon emissions, this could become a substantial value.

# *Worksheets and Sample Web Pages*

| Renewable Energy Potential Summary Table | | | |
|---|---|---|---|
| Resource | Quantity | Units | Energy Content |
| | | | Trillion Btu per year |
| Agricultural Crop Residue | | Tons | |
| Manures and Animal Wastes | | SCF | |
| Wood/woody Biomass | | Tons | |
| Wind | | kw-hr | |
| Solar | | | |
| Geothermal | | | |
| Total | | | 0 |

| Energy Use Summary Table | | | | | | |
|---|---|---|---|---|---|---|
| Energy Type | Residential | Transport | Agriculture | Industrial | Commercial/Public Bldg | Totals |
| All units in Trillion Btu/year | | | | | | 0 |
| Gasoline | | | | | | 0 |
| Diesel Fuel | | | | | | 0 |
| Heating Oil | | | | | | 0 |
| Natural Gas | | | | | | 0 |
| Kerosene | | | | | | 0 |
| Coal/Coke | | | | | | 0 |
| Wood | | | | | | 0 |
| Delivered Electricity | | | | | | 0 |
| Geothermal | | | | | | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | |

| Crop Residue Summary Table | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Column | | C | D | E | F | G | H | I | J | K | | |
| Formula | | | | | | | | =B*C*E*F*(1-G)*H | | =H*I/10^6 | | |
| Crop | Acres Harvested | Yield | Units | Bushel wgt in lbs | Removal Fraction | Moisture % | Residue to Crop Ratio | Annual Biomass Potential (lbs) | Btu content per dry lb | Million Btu/year | | |
| Barley | | | bu | 48 | 1 | 14.5% | 1.2 | 0 | 7500 | 0 | | |
| Canola | | | | 50 | 1 | 8.0% | 2.2 | 0 | 7500 | 0 | | |
| Corn Stover | | | bu | 56 | 0.5 | 15.5% | 1 | 0 | 7768 | 0 | | |
| Cotton | | | | 32 | 1 | 12.0% | 4.5 | 0 | 7500 | 0 | | |
| Dry Beans | | | | 60 | 1 | 13.0% | 1.2 | 0 | 7500 | 0 | | |
| Flaxseed | | | | 56 | 1 | 8.0% | 1.2 | 0 | 7500 | 0 | | |
| Oat Straw | | | | 32 | 1 | 14.0% | 1.3 | 0 | 7626 | 0 | | |
| Peanuts | | | | 22 | 1 | 9.9% | 1 | 0 | 7500 | 0 | | |
| Peas | | | | 60 | 1 | 9.8% | 1.5 | 0 | 7500 | 0 | | |
| Potatoes | | | | 60 | 1 | 13.3% | 0.4 | 0 | 7500 | 0 | | |
| Rice | | | | 45 | 1 | 15.0% | 1.4 | 0 | 7500 | 0 | | |
| Rye | | | | 56 | 1 | 10.0% | 1.6 | 0 | 7500 | 0 | | |
| Safflower | | | | 40 | 1 | 8.0% | 1.2 | 0 | 7500 | 0 | | |
| Sorghum | | | | 56 | 1 | 12.0% | 1.4 | 0 | 7500 | 0 | | |
| Soybeans | | | | 60 | 1 | 13.0% | 2.1 | 0 | 7500 | 0 | | |
| Sugar Cane | | | | 50 | 1 | 62.8% | 1.6 | 0 | 7500 | 0 | | |
| Sunflower | | | | 30 | 1 | 10.0% | 2.1 | 0 | 7500 | 0 | | |
| Wheat Straw | | | | 60 | 1 | 13.5% | 1.3 | 0 | 7375 | 0 | | |
| CRP and similar grassland | | 2 | tons | 2000 | 1 | 0.0% | 1 | 0 | 7500 | 0 | | |
| Brushland on 5 yr cycle | | 0.84 | tons | 2000 | 1 | 0.0% | 1 | 0 | 7500 | 0 | | |
| Total Energy Potential | | | | | | | | | | 0 | mm Btu/yr | |
| IN TRILLION BTU/year | | | | | | | | | | 0 | trillion Btu/yr | |

| Animal Residue Methane Potential | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Column | | B | C | D | E | F | G | H | I |
| Formula | | | | | =B*C*D | | | =E*F*G | =H*970/10^6 |
| Herd Invenstory | Assumed herd composition | Animal Count | Typical Animal Mass | Volatile Solids/lb TAM | Total Vol. Solids | Vol Solids | Cu Ft Methane Yield | Methane Yield | Methane Yield |
| Enter herd or flock inventory reported by USDA in column C | | | lbs | per year | per year | % Destruction | per lb VS destroyed | cu ft/year | mm Btu/year |
| **Feedlot Beef Cattle** | **Enter total here --->** | 0 | | | | | | | |
| Steers and Heifers | 33% | 0 | 915 | 2.6 | 0 | 55% | 5.29 | 0.00 | 0.00 |
| Calves | 33% | 0 | 397 | 2.6 | 0 | 55% | 5.29 | 0.00 | 0.00 |
| Steers | | 0 | 794 | 2.6 | 0 | 55% | 5.29 | 0.00 | 0.00 |
| Heifers | | 0 | 794 | 2.6 | 0 | 55% | 5.29 | 0.00 | 0.00 |
| Cows | 33% | 0 | 1102 | 2.6 | 0 | 55% | 5.29 | 0.00 | 0.00 |
| Bulls | | 0 | 1587 | 2.6 | 0 | 55% | 5.29 | 0.00 | 0.00 |
| | | | | | | | | | |
| **Dairy Cattle** | **Enter total here --->** | 0 | | | | | | | |
| Calfs | 18% | 0 | | | | | | | |
| Heifers | 18% | 0 | 903 | 3.65 | 0 | 55% | 3.84 | 0.00 | 0.00 |
| Cows | 64% | 0 | 1345 | 3.65 | 0 | 55% | 3.84 | 0.00 | 0.00 |
| | | | | | | | | | |
| **Swine** | **Enter type below** | | | | | | | | |
| Market | | 0 | 101 | 3.1 | 0 | 65% | 7.53 | 0.00 | 0.00 |
| Breeding | | 0 | 399 | 3.1 | 0 | 65% | 5.77 | 0.00 | 0.00 |
| | | | | | | | | | |
| **Poultry** | **Enter type below** | | | | | | | | |
| Layers | | 0 | 3.5 | 4.4 | 0 | 60% | 5.45 | 0.00 | 0.00 |
| Broilers | | 0 | 1.5 | 6.2 | 0 | 60% | 4.81 | 0.00 | 0.00 |
| Turkeys | | 0 | 7.5 | 3.32 | 0 | 60% | 4.81 | 0.00 | 0.00 |
| | | | | | | | | | |
| **Sheep** | | | 154 | 3.36 | 0 | 55% | 5.77 | 0.00 | 0.00 |
| | | | | | | | | | |
| Total annual energy potential in mm Btu/year | | | | | | | | | 0.00 |
| Total annual energy potential in trillion Btu/year | | | | | | | | | 0.0 |

| Logging Residue Energy Estimate | | | | | | | |
|---|---|---|---|---|---|---|---|
| Column | B | C | D | E | F | G | |
| Formula | | | | =B*C/D | | =E*F | |
| Units | cu ft/year | % harvested | cubic feet/cord | cords/year | million Btu/cor | million Btu/year | |
| Hardwood | | 33% | 85 | | 25 | | |
| Softwood | | 33% | 85 | | 15 | | |
| Total energy potential million Btu/year | | | | | | 0 | |
| Energy potential in trillion Btu/year | | | | | | 0 | |

## Wind Energy Estimate

| Line | | | | Formula |
|---|---|---|---|---|
| A | County area is acres | | | |
| B | % available for wind development | | acres | |
| C | Acres available for development | | | =A*B |
| | | | | |
| D | Turbine size | 1.65 | MW | |
| E | Acres per unit | 40 | | |
| F | MW installed per acre | 0.04125 | MW/acre | =D/E |
| | | | | |
| G | Capacity factor | | | |
| H | Annual hours | 8760 | hours/year | |
| | | | | |
| I | MW hours per year | | | =C*F*G*H |
| J | Trillion Btu/year | | | =I*3.412/10^6 |

| Estimated Residential Energy Consumption by Household Number Method | | | |
|---|---|---|---|
| Total number of households | 0 | Enter from census QuickFacts | |
| Column | B | C | D |
| Formula | =household number * B | | |
| Energy Type | million Btu per household per year | Annual Energy Million Btu per year | On Site |
| Electricity - Primary | *111.5* | - | |
| Electricity - Site | *37.3* | - | - |
| Natural Gas | *85.0* | - | - |
| Fuel Oil | *75.4* | - | - |
| Kerosene | *0.0* | - | - |
| LPG | *63.9* | - | - |
| Wood | *29.3* | - | - |
| Total | *402.4* | - | - |
| | | | |
| In Trillion Btu per year | | 0.00 | 0.00 |
| | | | |
| Data Source | | | |
| in U.S. Households by Midwest | | | |
| Census Region, 2001 | | | |

## Estimated Residential Energy Consumption by Age of Household Method

| | *1990 to 2000* | *1980 to 1989* | *1970 to 1979* | *1960 to 1969* | *1950 to 1959* | *1949 or before* |
|---|---|---|---|---|---|---|
| *Census Data on Household Energy Consumption by Year of Construction* | | | | | | |
| *Electricity Primary* | *130.9* | *127.9* | *97.8* | *97.2* | *85* | *85* |
| *Electricity Site* | *43.8* | *42.8* | *40.8* | *32.7* | *28.4* | *28.4* |
| *Natural Gas* | *70.9* | *64.3* | *63* | *64.6* | *72.9* | *84.3* |
| *Fuel Oil* | *77.8* | *91.4* | *77.3* | *68.3* | *79* | *87.5* |
| *Kerosene* | *21.3* | *13.5* | *23.2* | | *11.4* | *11.6* |
| *LPG* | *41.1* | *36.6* | *37.5* | *34.2* | *26.3* | *51.6* |
| *Wood* | *14.8* | *20* | *23* | *21.1* | *2706* | *48.5* |
| *Total* | *254.9* | *248.6* | *241.8* | *199.8* | *218.0* | *263.4* |

Data in this table from ce1-2c Total Energy Consumption in U.S. Households by Year of Construction, 2001

All units in million Btu/household

| | | | | | | |
|---|---|---|---|---|---|---|
| Houses per group | 0 | 0 | 0 | 0 | 0 | 0 |

Data from Census Statistics DP-4 Profile of Selected Housing Characteristics

| Energy Use in Million Btu per year | | | | | | | On Site |
|---|---|---|---|---|---|---|---|
| Electricity Primary | - | - | - | - | - | - | |
| Electricity Site | - | - | - | - | - | - | - |
| Natural Gas | - | - | - | - | - | - | - |
| Fuel Oil | - | - | - | - | - | - | - |
| Kerosene | - | - | - | - | - | - | - |
| LPG | - | - | - | - | - | - | - |
| Wood | - | - | - | - | - | - | - |
| Total for all households | | | | | | | - |
| In Trillion Btu per year | | | | | | | - |

## Annual Fuel Consumption Estimate Based on VMT by County.

| Column | B | C | D | E | |
|---|---|---|---|---|---|
| | Annual Vehicle Miles Traveled | | | | |
| County Name | Bituminous | Concrete | Dirt | Total | |
| | | | | | |
| | | | | - | |
| | | | | - | |
| | | | | - | |
| | | | | - | |
| Total VMT in Region | | | | - | |
| | | | | | |
| | | = B*Total VMT | | = C/D | |
| Composition of VMT | % of VMT | Miles Traveled | Mileage | Annual Fuel Use | |
| Passenger Cars | 55.8% | - | 22.4 | - | |
| Light Trucks/SUV | 36.1% | - | 18 | - | |
| Single Unit Trucks | 2.7% | - | 8.2 | - | |
| Combination Trucks | 4.7% | - | 5.1 | - | |
| Total | 99.3% | - | | | |
| | | | | | |
| | | | = B*C | = D/10^12 | |
| Convert Fuel Use to Btu's | Gallons per yea | LHV Btu/gallon | Btu/year | Trillion Btu/yr | |
| Gasoline | - | 116,090 | 0 | 0.00 | |
| Diesel | - | 129,060 | 0 | 0.00 | |

# On Farm Energy Use Estimate

| Column | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|
| Formula | | | | | | | = B*C | = B*D | = B*E | = B*F |
| | Energy Input per Unit | | | | | | Annual Energy Use | | | |
| Commodity | Acres | Diesel | Gasoline | LP Gas | Electric | Unit | Diesel | Gasoline | LP Gas | Electric |
| | | gallons | gallons | gallons | kW-hr | | gallons | gallons | gallons | kW-hr |
| Barley All | | *7.24* | *0.89* | *0.82* | 29.88 | acre | 0 | 0 | 0 | 0 |
| Beans Dry Edible | | *7.43* | *0.91* | *0.75* | 27.5 | acre | 0 | 0 | 0 | 0 |
| Canola | | *4.5* | *0.75* | *0* | 26.8 | acre | 0 | 0 | 0 | 0 |
| Corn for Grain | | *8* | *1.15* | *9.58* | 35.63 | acre | 0 | 0 | 0 | 0 |
| Corn for Silage | | *9.37* | *1.15* | | | acre | 0 | 0 | 0 | 0 |
| Flaxseed | | *7.24* | *0.89* | *0.82* | 29.88 | acre | 0 | 0 | 0 | 0 |
| Green Peas for Processing | | *5.19* | *0.64* | *0.35* | 12.75 | acre | 0 | 0 | 0 | 0 |
| Hay Alfalfa (Dry) | | *9.8* | *0.81* | *0* | 32.73 | acre | 0 | 0 | 0 | 0 |
| Hay All | | *9.8* | *0.81* | *0* | 32.73 | acre | 0 | 0 | 0 | 0 |
| Hay Other (Dry) | | *9.8* | *0.81* | *0* | 32.73 | acre | 0 | 0 | 0 | 0 |
| Oats | | *7.24* | *0.89* | *0.82* | 29.88 | acre | 0 | 0 | 0 | 0 |
| Potatoes Dry Land | | *24.18* | *2* | *0* | 170.73 | acre | 0 | 0 | 0 | 0 |
| Potatoes Irrigated | | *48.89* | *2* | *0* | 345.38 | acre | 0 | 0 | 0 | 0 |
| Rye | | *7.24* | *0.89* | *0.82* | 29.88 | acre | 0 | 0 | 0 | 0 |
| Soybeans | | *7.43* | *0.91* | *0.75* | 27.5 | acre | 0 | 0 | 0 | 0 |
| Sugarbeets | | *28.92* | *3.54* | *2.76* | 100.75 | acre | 0 | 0 | 0 | 0 |
| Sunflower All | | *7.18* | *0.88* | *1.87* | 40.75 | acre | 0 | 0 | 0 | 0 |
| Sunflower Seed for Oil | | *5.7* | *1* | *2* | 30.72 | acre | 0 | 0 | 0 | 0 |
| Sunflower Seed Non-Oil Uses | | *5.7* | *1* | *2* | 30.72 | acre | 0 | 0 | 0 | 0 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sweet Corn for Processing | | *7.99* | *0.98* | *0* | 0 | acre | 0 | 0 | 0 | 0 |
| Wheat All | | *7.24* | *0.89* | *0.82* | 29.88 | acre | 0 | 0 | 0 | 0 |
| Wheat Durum | | *7.24* | *0.89* | *0.82* | 29.88 | acre | 0 | 0 | 0 | 0 |
| Wheat Other Spring | | *7.24* | *0.89* | *0.82* | 29.88 | acre | 0 | 0 | 0 | 0 |
| Winter Wheat All | | *7.24* | *0.89* | *0.82* | 29.88 | acre | 0 | 0 | 0 | 0 |
| | Head count | | | | | | | | | |
| Dairy | | *0.13* | *0.02* | *0.11* | 4 | cwt | 0 | 0 | 0 | 0 |
| Swine Farrow | | *9.05* | *1.11* | *4.06* | 148.25 | litter | 0 | 0 | 0 | 0 |
| Beef Calf | | *6.07* | *0.74* | *1.62* | 59.25 | head | 0 | 0 | 0 | 0 |
| Beef Cattle | | *3.78* | *0.46* | *1.08* | 39.38 | head | 0 | 0 | 0 | 0 |
| Turkeys | | *0.09* | *0.01* | *0.5* | 1.24 | head | 0 | 0 | 0 | 0 |
| | | | | | | | | | | |
| Total Units per year | | | | | | | - | - | - | - |
| Conversion factor Btu/unit | | | | | | | *129,090* | *116,090* | *91,547* | *3412* |
| Trillion Btu per year | | | | | | | - | - | - | - |

| Commercial Building Energy Use | | | | | |
|---|---|---|---|---|---|
| A | *B* | *C* | D | E | F |
| Principal Bldg Activity | *kwhr/sq ft* | *thousand Btu/Sq ft* | Total Area by Use | kw-hr/yr | thousand Btu/yr |
| | | | | =D*B | =D*C |
| Education | *11* | *38.1* | | - | - |
| Food Sales | *49.4* | *51.7* | | - | - |
| Food Service | *38.4* | *145.6* | | - | - |
| Health Care | *22.9* | *95.3* | | - | - |
| Inpatient | *27.5* | *113.2* | | - | - |
| Outpatient | *16.1* | *51.8* | | - | - |
| Lodging | *13.5* | *50.4* | | - | - |
| Mercantile | *19.2* | *33.5* | | - | - |
| Retail | *14.3* | *31.9* | | - | - |
| Enclosed and Strip Malls | *22.3* | *34.4* | | - | - |
| Office | *17.3* | *32.8* | | - | - |
| Public Assembly | *12.5* | *37.5* | | - | - |
| Public Order and Safety | *15.3* | *45* | | - | - |
| Religious Worship | *4.9* | *31.2* | | - | - |
| Service | *11* | *55.8* | | - | - |
| Warehouse and Storage | *7.6* | *24.1* | | - | - |
| Other | *22.5* | *69.7* | | - | - |
| Vacant | *2.4* | *23.7* | | - | - |
| Total energy use | | | | - | - |
| Million Btu per year | | | | - | - |
| Trillion Btu/year | | | | - | - |

U.S. Census Bureau

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## Minnesota

Further information

Want more? **Browse data sets for Minnesota**

| People QuickFacts | Minnesota | USA |
|---|---|---|
| Population, 2007 estimate | 5,197,621 | 301,621,157 |
| Population, percent change, April 1, 2000 to July 1, 2007 | 5.7% | 7.2% |
| Population, 2000 | 4,919,479 | 281,421,906 |
| Persons under 5 years old, percent, 2007 | 6.8% | 6.9% |
| Persons under 18 years old, percent, 2007 | 24.2% | 24.5% |
| Persons 65 years old and over, percent, 2007 | 12.2% | 12.6% |
| Female persons, percent, 2007 | 50.2% | 50.7% |
| White persons, percent, 2007 (a) | 89.3% | 80.0% |
| Black persons, percent, 2007 (a) | 4.5% | 12.8% |
| American Indian and Alaska Native persons, percent, 2007 (a) | 1.2% | 1.0% |
| Asian persons, percent, 2007 (a) | 3.5% | 4.4% |
| Native Hawaiian and Other Pacific Islander, percent, 2007 (a) | 0.1% | 0.2% |
| Persons reporting two or more races, percent, 2007 | 1.5% | 1.6% |
| Persons of Hispanic or Latino origin, percent, 2007 (b) | 4.0% | 15.1% |
| White persons not Hispanic, percent, 2007 | 85.7% | 66.0% |
| Living in same house in 1995 and 2000, pct 5 yrs old & over | 57.0% | 54.1% |
| Foreign born persons, percent, 2000 | 5.3% | 11.1% |
| Language other than English spoken at home, pct age 5+, 2000 | 8.5% | 17.9% |
| High school graduates, percent of persons age 25+, 2000 | 87.9% | 80.4% |
| Bachelor's degree or higher, pct of persons age 25+, 2000 | 27.4% | 24.4% |
| Persons with a disability, age 5+, 2000 | 679,236 | 49,746,248 |
| Mean travel time to work (minutes), workers age 16+, 2000 | 21.9 | 25.5 |
| Housing units, 2007 | 2,304,467 | 127,901,934 |
| Homeownership rate, 2000 | 74.6% | 66.2% |
| Housing units in multi-unit structures, percent, 2000 | 22.3% | 26.4% |
| Median value of owner-occupied housing units, 2000 | $122,400 | $119,600 |
| Households, 2000 | 1,895,127 | 105,480,101 |
| Persons per household, 2000 | 2.52 | 2.59 |

| | | |
|---|---|---|
| Median household income, 2007 | $55,664 | $50,740 |
| Per capita money income, 1999 | $23,198 | $21,587 |
| Persons below poverty, percent, 2007 | 9.5% | 13.0% |

| **Business QuickFacts** | **Minnesota** | **USA** |
|---|---|---|
| Private nonfarm establishments, 2006 | 151,150[1] | 7,601,160 |
| Private nonfarm employment, 2006 | 2,476,354[1] | 119,917,165 |
| Private nonfarm employment, percent change 2000-2006 | 3.4%[1] | 5.1% |
| Nonemployer establishments, 2006 | 376,864 | 20,768,555 |
| Total number of firms, 2002 | 443,827 | 22,974,655 |
| Black-owned firms, percent, 2002 | 1.8% | 5.2% |
| American Indian and Alaska Native owned firms, percent, 2002 | 0.6% | 0.9% |
| Asian-owned firms, percent, 2002 | 1.7% | 4.8% |
| Native Hawaiian and Other Pacific Islander owned firms, percent, 2002 | S | 0.1% |
| Hispanic-owned firms, percent, 2002 | 0.9% | 6.8% |
| Women-owned firms, percent, 2002 | 27.9% | 28.2% |
| Manufacturers shipments, 2002 ($1000) | 80,623,873 | 3,916,136,712 |
| Wholesale trade sales, 2002 ($1000) | 108,388,816 | 4,634,755,112 |
| Retail sales, 2002 ($1000) | 60,015,531 | 3,056,421,997 |
| Retail sales per capita, 2002 | $11,943 | $10,615 |
| Accommodation and foodservices sales, 2002 ($1000) | 7,959,590 | 449,498,718 |
| Building permits, 2007 | 17,930 | 1,398,414 |
| Federal spending, 2007 ($1000) | 40,075,391[1] | 2,536,629,405[2] |

| **Geography QuickFacts** | **Minnesota** | **USA** |
|---|---|---|
| Land area, 2000 (square miles) | 79,610.08 | 3,537,438.44 |
| Persons per square mile, 2000 | 61.8 | 79.6 |
| FIPS Code | 27 | |

1: Includes data not distributed by county.
2: Includes data not distributed by state.

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(a) Includes persons reporting only one race.
(b) Hispanics may be of any race, so also are included in applicable race categories.

D: Suppressed to avoid disclosure of confidential information
F: Fewer than 100 firms
FN: Footnote on this item for this area in place of data
NA: Not available
S: Suppressed; does not meet publication standards
X: Not applicable
Z: Value greater than zero but less than half unit of measure shown

What do you think of QuickFacts?

Source U.S. Census Bureau: State and County QuickFacts. Data derived from Population Estimates, Census of Population and Housing, Small Area Income and Poverty Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits, Consolidated Federal Funds Report

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## Marshall County, Minnesota

Further information

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| People QuickFacts | Marshall County | Minnesota |
|---|---|---|
| Population, 2007 estimate | 9,618 | 5,197,621 |
| Population, percent change, April 1, 2000 to July 1, 2007 | -5.3% | 5.7% |
| Population, 2000 | 10,155 | 4,919,479 |
| Persons under 5 years old, percent, 2007 | 5.6% | 6.8% |
| Persons under 18 years old, percent, 2007 | 21.4% | 24.2% |
| Persons 65 years old and over, percent, 2007 | 20.0% | 12.2% |
| Female persons, percent, 2007 | 49.2% | 50.2% |
| White persons, percent, 2007 (a) | 98.4% | 89.3% |
| Black persons, percent, 2007 (a) | 0.1% | 4.5% |
| American Indian and Alaska Native persons, percent, 2007 (a) | 0.4% | 1.2% |
| Asian persons, percent, 2007 (a) | 0.4% | 3.5% |
| Native Hawaiian and Other Pacific Islander, percent, 2007 (a) | 0.0% | 0.1% |
| Persons reporting two or more races, percent, 2007 | 0.7% | 1.5% |
| Persons of Hispanic or Latino origin, percent, 2007 (b) | 4.0% | 4.0% |
| White persons not Hispanic, percent, 2007 | 94.4% | 85.7% |
| Living in same house in 1995 and 2000, pct 5 yrs old & over | 71.8% | 57.0% |
| Foreign born persons, percent, 2000 | 1.9% | 5.3% |
| Language other than English spoken at home, pct age 5+, 2000 | 6.7% | 8.5% |
| High school graduates, percent of persons age 25+, 2000 | 79.1% | 87.9% |
| Bachelor's degree or higher, pct of persons age 25+, 2000 | 12.0% | 27.4% |
| Persons with a disability, age 5+, 2000 | 1,651 | 679,236 |
| Mean travel time to work (minutes), workers age 16+, 2000 | 23.2 | 21.9 |
| Housing units, 2007 | 4,933 | 2,304,467 |
| Homeownership rate, 2000 | 83.6% | 74.6% |
| Housing units in multi-unit structures, percent, 2000 | 8.2% | 22.3% |
| Median value of owner-occupied housing units, 2000 | $50,500 | $122,400 |
| Households, 2000 | 4,101 | 1,895,127 |
| Persons per household, 2000 | 2.45 | 2.52 |

| | | |
|---|---|---|
| Median household income, 2007 | $45,145 | $55,664 |
| Per capita money income, 1999 | $16,317 | $23,198 |
| Persons below poverty, percent, 2007 | 10.3% | 9.5% |

| **Business QuickFacts** | **Marshall County** | **Minnesota** |
|---|---|---|
| Private nonfarm establishments, 2006 | 303 | 151,150[1] |
| Private nonfarm employment, 2006 | 1,767 | 2,476,354[1] |
| Private nonfarm employment, percent change 2000-2006 | -24.6% | 3.4%[1] |
| Nonemployer establishments, 2006 | 658 | 376,864 |
| Total number of firms, 2002 | 869 | 443,827 |
| Black-owned firms, percent, 2002 | F | 1.8% |
| American Indian and Alaska Native owned firms, percent, 2002 | F | 0.6% |
| Asian-owned firms, percent, 2002 | F | 1.7% |
| Native Hawaiian and Other Pacific Islander owned firms, percent, 2002 | F | S |
| Hispanic-owned firms, percent, 2002 | F | 0.9% |
| Women-owned firms, percent, 2002 | S | 27.9% |
| Manufacturers shipments, 2002 ($1000) | NA | 80,623,873 |
| Wholesale trade sales, 2002 ($1000) | 92,016 | 108,388,816 |
| Retail sales, 2002 ($1000) | 71,703 | 60,015,531 |
| Retail sales per capita, 2002 | $7,202 | $11,943 |
| Accommodation and foodservices sales, 2002 ($1000) | D | 7,959,590 |
| Building permits, 2007 | 4 | 17,930 |
| Federal spending, 2007 ($1000) | 99,563 | 40,075,391[1] |

| **Geography QuickFacts** | **Marshall County** | **Minnesota** |
|---|---|---|
| Land area, 2000 (square miles) | 1,772.24 | 79,610.08 |
| Persons per square mile, 2000 | 5.7 | 61.8 |
| FIPS Code | 089 | 27 |
| Metropolitan or Micropolitan Statistical Area | None | |

1: Includes data not distributed by county.

Download these tables - delimited | Download these tables - Excel | Download the full data set

(a) Includes persons reporting only one race.
(b) Hispanics may be of any race, so also are included in applicable race categories.

D: Suppressed to avoid disclosure of confidential information
F: Fewer than 100 firms
FN: Footnote on this item for this area in place of data
NA: Not available
S: Suppressed; does not meet publication standards
X: Not applicable
Z: Value greater than zero but less than half unit of measure shown

What do you think of QuickFacts?

Source U.S. Census Bureau: State and County QuickFacts. Data derived from Population Estimates, Census of Population and Housing, Small Area Income and Poverty Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits, Consolidated Federal Funds Report

Last Revised: Friday, 20-Feb-2009 09:29:16 EST

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U.S. Census Bureau

American FactFinder

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*Your source for population, housing, economic, and geographic data*

- POPULATION FINDER
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- BUSINESS AND GOVERNMENT
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**Address Search...**

Enter a street address to find Census 2000 data

- Browser Notes
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## Fast Access to Information

Get a **Fact Sheet** for your community...

city/ town, county, or zip

state -- select a state -- GO

or select a state using a map »

## Getting Detailed Data

**Decennial Census** - taken every 10 years to collect information about the people and housing of the United States
learn more | get data

See the Count Question Resolution Program for information on Census 2000 count corrections.

**American Community Survey** - an ongoing survey that provides data about your community every year
learn more | get data

**Puerto Rico Community Survey** - the equivalent of the American Community Survey for Puerto Rico
learn more | get data | en español

**Population Estimates Program** - population numbers between censuses
learn more | get data

**Economic Census** - profiles the U.S. economy every 5 years
learn more | get data

**Annual Economic Surveys** - data from the Annual Survey of Manufactures, County Business Patterns and Nonemployer Statistics
learn more | get data

## Special Interest

La Encuesta sobre la Comunidad de Puerto Rico y Censo 2000 Puerto Rico en español

American Indian and Alaska Native data and links

FastFacts for Congress - Demographic and economic data for Congressional Districts

Kids' Corner - Learn fun facts about your state and take a quiz

Information on Religion and Genealogy

## Population Data

**Population Finder**

Use the Population Finder to view population trends for your community.

**U.S. Population Clock**

20:29 GMT (EST+5) Feb 23, 2009

305,879,258

more population clocks »

## What's New

**2008 Population Estimates** for the U.S. and states are now available from the Data Sets page.

**Updates to American FactFinder** released December 9, 2008. more »

**2005-2007 American Community Survey 3-Year Estimates** are now available for cities, counties and other areas with populations of 20,000 or more from the Data Sets page.

**2007 Commodity Flow Survey** data are now available from the Economic Census Data Sets page.

**2006 Annual Survey of Manufactures** has been updated. New data are now available from the Data Sets page.

**2006 County Business Patterns** Quick Reports and Thematic Maps and ZIP Code Business Patterns data are now available from the Data Sets page.

**2006 Nonemployer Statistics** data are now available from the Data Sets page.

**Census 2000 State Legislative District Summary Files (Sample and 100-Percent)** Data from the Census 2000 Summary Files 1 and 3 retabulated using updated State Legislative District boundaries. more »

archive »

Also see the Bureau's latest news releases and The Broadcast Zone.



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FACT SHEET

United States

## United States

city/ town, county, or zip: Marshall
state: Minnesota GO

search by address »

2005-2007 | 2000

**2005-2007 American Community Survey 3-Year Estimates - what's this?** Narrative Profile | Reference Map

**Data Profile Highlights:**

NOTE. Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

| Social Characteristics - show more >> | Estimate | Percent | Margin of Error | |
|---|---|---|---|---|
| Average household size | 2.60 | (X) | +/-0.01 | map |
| Average family size | 3.19 | (X) | +/-0.01 | |
| Population 25 years and over | 195,646,383 | | +/-26,981 | |
| High school graduate or higher | (X) | 84.0 | (X) | map |
| Bachelor's degree or higher | (X) | 27.0 | (X) | map |
| Civilian veterans (civilian population 18 years and over) | 23,392,676 | 10.4 | +/-36,030 | map |
| Disability status (population 5 years and over) | 41,101,667 | 15.1 | +/-68,111 | |
| Foreign born | 37,234,785 | 12.5 | +/-75,409 | map |
| Male, Now married, except separated (population 15 years and over) | 61,030,689 | 52.6 | +/-110,254 | |
| Female, Now married, except separated (population 15 years and over) | 59,165,050 | 48.5 | +/-94,418 | |
| Speak a language other than English at home (population 5 years and over) | 54,327,142 | 19.5 | +/-77,002 | map |
| Household population | 290,655,225 | | ***** | |
| Group quarters population | (X) | (X) | (X) | |

| Economic Characteristics - show more >> | Estimate | Percent | Margin of Error | |
|---|---|---|---|---|
| In labor force (population 16 years and over) | 151,062,383 | 64.7 | +/-71,512 | map |
| Mean travel time to work in minutes (workers 16 years and over) | 25.1 | (X) | +/-0.1 | map |
| Median household income (in 2007 inflation-adjusted dollars) | 50,007 | (X) | +/-45 | map |
| Median family income (in 2007 inflation-adjusted dollars) | 60,374 | (X) | +/-76 | map |
| Per capita income (in 2007 inflation-adjusted dollars) | 26,178 | (X) | +/-33 | |
| Families below poverty level | (X) | 9.8 | (X) | |
| Individuals below poverty level | (X) | 13.3 | (X) | map |

| Housing Characteristics - show more >> | Estimate | Percent | Margin of Error | |
|---|---|---|---|---|
| Total housing units | 126,237,884 | | +/-7,902 | |
| Occupied housing units | 111,609,629 | 88.4 | +/-103,102 | |
| Owner-occupied housing units | 75,072,666 | 67.3 | +/-172,605 | |
| Renter-occupied housing units | 36,536,963 | 32.7 | +/-85,411 | |
| Vacant housing units | 14,628,255 | 11.6 | +/-95,919 | |
| | | | | |
| Owner-occupied homes | 75,072,666 | | +/-172,605 | map |
| Median value (dollars) | 181,800 | (X) | +/-211 | map |
| Median of selected monthly owner costs | | | | |
| With a mortgage (dollars) | 1,427 | (X) | +/-2 | map |
| Not mortgaged (dollars) | 402 | (X) | +/-1 | |

| ACS Demographic Estimates - show more >> | Estimate | Percent | Margin of Error | |
|---|---|---|---|---|
| Total population | 298,757,310 | | ***** | |
| Male | 147,129,583 | 49.2 | +/-8,985 | |
| Female | 151,627,727 | 50.8 | +/-8,991 | |
| Median age (years) | 36.4 | (X) | +/-0.2 | map |
| Under 5 years | 20,480,587 | 6.9 | +/-4,924 | |
| 18 years and over | 225,081,715 | 75.3 | +/-12,202 | |
| 65 years and over | 37,265,110 | 12.5 | +/-7,725 | |
| | | | | |
| One race | 292,623,984 | 97.9 | +/-42,357 | |
| White | 221,457,175 | 74.1 | +/-66,715 | map |
| Black or African American | 36,969,063 | 12.4 | +/-26,733 | map |
| American Indian and Alaska Native | 2,374,222 | 0.8 | +/-12,725 | map |
| Asian | 12,951,215 | 4.3 | +/-14,993 | map |
| Native Hawaiian and Other Pacific Islander | 432,436 | 0.1 | +/-6,325 | map |
| Some other race | 18,439,873 | 6.2 | +/-68,672 | map |
| Two or more races | 6,133,326 | 2.1 | +/-42,332 | map |
| | | | | |
| Hispanic or Latino (of any race) | 44,019,880 | 14.7 | +/-3,514 | |

Source: U.S. Census Bureau, 2005-2007 American Community Survey

Explanation of Symbols:
'***' - The median falls in the lowest interval or upper interval of an open-ended distribution. A statistical test is not appropriate.
'*****' - The estimate is controlled. A statistical test for sampling variability is not appropriate.
'N' - Data for this geographic area cannot be displayed because the number of sample cases is too small.
'(X)' - The value is not applicable or not available.

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FACT SHEET

United States | Minnesota | Marshall County

## Marshall County, Minnesota



2000 2005-2007 data not available for this geography

View a Fact Sheet for a **race, ethnic, or ancestry group**

### Census 2000 Demographic Profile Highlights:

Reference Map

| General Characteristics - show more >> | Number | Percent | U.S. | | |
|---|---|---|---|---|---|
| Total population | 10,155 | | | map | brief |
| Male | 5,157 | 50.8 | 49.1% | map | brief |
| Female | 4,998 | 49.2 | 50.9% | map | brief |
| Median age (years) | 40.5 | (X) | 35.3 | map | brief |
| Under 5 years | 583 | 5.7 | 6.8% | map | |
| 18 years and over | 7,572 | 74.6 | 74.3% | | |
| 65 years and over | 1,881 | 18.5 | 12.4% | map | brief |
| | | | | | |
| One race | 10,094 | 99.4 | 97.6% | | |
| White | 9,873 | 97.2 | 75.1% | map | brief |
| Black or African American | 10 | 0.1 | 12.3% | map | brief |
| American Indian and Alaska Native | 29 | 0.3 | 0.9% | map | brief |
| Asian | 17 | 0.2 | 3.6% | map | brief |
| Native Hawaiian and Other Pacific Islander | 0 | 0.0 | 0.1% | map | brief |
| Some other race | 165 | 1.6 | 5.5% | map | |
| Two or more races | 61 | 0.6 | 2.4% | map | brief |
| | | | | | |
| Hispanic or Latino (of any race) | 298 | 2.9 | 12.5% | map | brief |
| | | | | | |
| Household population | 10,032 | 98.8 | 97.2% | map | brief |
| Group quarters population | 123 | 1.2 | 2.8% | map | |
| | | | | | |
| Average household size | 2.45 | (X) | 2.59 | map | brief |
| Average family size | 3.01 | (X) | 3.14 | map | |
| | | | | | |
| Total housing units | 4,791 | | | map | |
| Occupied housing units | 4,101 | 85.6 | 91.0% | | brief |
| Owner-occupied housing units | 3,427 | 83.6 | 66.2% | map | |
| Renter-occupied housing units | 674 | 16.4 | 33.8% | map | brief |
| Vacant housing units | 690 | 14.4 | 9.0% | map | |

| Social Characteristics - show more >> | Number | Percent | U.S. | | |
|---|---|---|---|---|---|
| Population 25 years and over | 6,914 | | | | |
| High school graduate or higher | 5,469 | 79.1 | 80.4% | map | brief |
| Bachelor's degree or higher | 827 | 12.0 | 24.4% | map | |

| | | | | | |
|---|---|---|---|---|---|
| Civilian veterans (civilian population 18 years and over) | 984 | 13.0 | 12.7% | map | brief |
| Disability status (population 5 years and over) | 1,651 | 17.5 | 19.3% | map | brief |
| Foreign born | 190 | 1.9 | 11.1% | map | brief |
| Male, Now married, except separated (population 15 years and over) | 2,592 | 63.1 | 56.7% | | brief |
| Female, Now married, except separated (population 15 years and over) | 2,580 | 64.2 | 52.1% | | brief |
| Speak a language other than English at home (population 5 years and over) | 638 | 6.7 | 17.9% | map | brief |

| **Economic Characteristics - show more >>** | **Number** | **Percent** | **U.S.** | | |
|---|---|---|---|---|---|
| In labor force (population 16 years and over) | 4,957 | 62.4 | 63.9% | | brief |
| Mean travel time to work in minutes (workers 16 years and over) | 23.2 | (X) | 25.5 | map | brief |
| Median household income in 1999 (dollars) | 34,804 | (X) | 41,994 | map | |
| Median family income in 1999 (dollars) | 41,908 | (X) | 50,046 | map | |
| Per capita income in 1999 (dollars) | 16,317 | (X) | 21,587 | map | |
| Families below poverty level | 197 | 6.9 | 9.2% | map | brief |
| Individuals below poverty level | 979 | 9.8 | 12.4% | map | |

| **Housing Characteristics - show more >>** | **Number** | **Percent** | **U.S.** | | |
|---|---|---|---|---|---|
| Single-family owner-occupied homes | 1,854 | | | | brief |
| Median value (dollars) | 50,500 | (X) | 119,600 | map | brief |
| Median of selected monthly owner costs | (X) | (X) | | | brief |
| With a mortgage (dollars) | 651 | (X) | 1,088 | map | |
| Not mortgaged (dollars) | 241 | (X) | 295 | | |

(X) Not applicable.

Source: U.S. Census Bureau, Summary File 1 (SF 1) and Summary File 3 (SF 3)

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DP-1. **Profile of General Demographic Characteristics: 2000**
Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data
Geographic Area: **Marshall County, Minnesota**

NOTE: For information on confidentiality protection, nonsampling error, definitions, and count corrections see http://factfinder.census.gov/home/en/datanotes/expsf1u.htm.

| Subject | Number | Percent |
|---|---|---|
| | | |
| **Total population** | **10,155** | **100.0** |
| | | |
| **SEX AND AGE** | | |
| Male | 5,157 | 50.8 |
| Female | 4,998 | 49.2 |
| | | |
| Under 5 years | 583 | 5.7 |
| 5 to 9 years | 647 | 6.4 |
| 10 to 14 years | 797 | 7.8 |
| 15 to 19 years | 810 | 8.0 |
| 20 to 24 years | 423 | 4.2 |
| 25 to 34 years | 980 | 9.7 |
| 35 to 44 years | 1,530 | 15.1 |
| 45 to 54 years | 1,452 | 14.3 |
| 55 to 59 years | 546 | 5.4 |
| 60 to 64 years | 506 | 5.0 |
| 65 to 74 years | 915 | 9.0 |
| 75 to 84 years | 737 | 7.3 |
| 85 years and over | 229 | 2.3 |
| | | |
| Median age (years) | 40.5 | (X) |
| | | |
| 18 years and over | 7,572 | 74.6 |
| Male | 3,826 | 37.7 |
| Female | 3,746 | 36.9 |
| 21 years and over | 7,220 | 71.1 |
| 62 years and over | 2,180 | 21.5 |
| 65 years and over | 1,881 | 18.5 |
| Male | 839 | 8.3 |
| Female | 1,042 | 10.3 |
| | | |
| **RACE** | | |
| One race | 10,094 | 99.4 |
| White | 9,873 | 97.2 |
| Black or African American | 10 | 0.1 |
| American Indian and Alaska Native | 29 | 0.3 |
| Asian | 17 | 0.2 |
| Asian Indian | 2 | 0.0 |
| Chinese | 1 | 0.0 |
| Filipino | 5 | 0.0 |
| Japanese | 0 | 0.0 |
| Korean | 8 | 0.1 |
| Vietnamese | 0 | 0.0 |

| | | |
|---|---|---|
| Other Asian | 1 | 0.0 |
| Native Hawaiian and Other Pacific Islander | 0 | 0.0 |
| Native Hawaiian | 0 | 0.0 |
| Guamanian or Chamorro | 0 | 0.0 |
| Samoan | 0 | 0.0 |
| Other Pacific Islander [2] | 0 | 0.0 |
| Some other race | 165 | 1.6 |
| Two or more races | 61 | 0.6 |
| | | |
| ***Race alone or in combination with one or more other races*** [3] | | |
| White | 9,930 | 97.8 |
| Black or African American | 20 | 0.2 |
| American Indian and Alaska Native | 67 | 0.7 |
| Asian | 26 | 0.3 |
| Native Hawaiian and Other Pacific Islander | 1 | 0.0 |
| Some other race | 175 | 1.7 |
| | | |
| **HISPANIC OR LATINO AND RACE** | | |
| **Total population** | **10,155** | **100.0** |
| Hispanic or Latino (of any race) | 298 | 2.9 |
| Mexican | 215 | 2.1 |
| Puerto Rican | 7 | 0.1 |
| Cuban | 0 | 0.0 |
| Other Hispanic or Latino | 76 | 0.7 |
| Not Hispanic or Latino | 9,857 | 97.1 |
| White alone | 9,750 | 96.0 |
| | | |
| **RELATIONSHIP** | | |
| **Total population** | **10,155** | **100.0** |
| In households | 10,032 | 98.8 |
| Householder | 4,101 | 40.4 |
| Spouse | 2,467 | 24.3 |
| Child | 3,061 | 30.1 |
| Own child under 18 years | 2,491 | 24.5 |
| Other relatives | 161 | 1.6 |
| Under 18 years | 44 | 0.4 |
| Nonrelatives | 242 | 2.4 |
| Unmarried partner | 115 | 1.1 |
| In group quarters | 123 | 1.2 |
| Institutionalized population | 112 | 1.1 |
| Noninstitutionalized population | 11 | 0.1 |
| | | |
| **HOUSEHOLDS BY TYPE** | | |
| **Total households** | **4,101** | **100.0** |
| Family households (families) | 2,836 | 69.2 |
| With own children under 18 years | 1,238 | 30.2 |
| Married-couple family | 2,467 | 60.2 |
| With own children under 18 years | 1,020 | 24.9 |
| Female householder, no husband present | 221 | 5.4 |
| With own children under 18 years | 138 | 3.4 |
| Nonfamily households | 1,265 | 30.8 |
| Householder living alone | 1,177 | 28.7 |
| Householder 65 years and over | 618 | 15.1 |
| | | |
| Households with individuals under 18 years | 1,273 | 31.0 |
| Households with individuals 65 years and over | 1,315 | 32.1 |
| | | |
| Average household size | 2.45 | (X) |
| Average family size | 3.01 | (X) |
| | | |
| **HOUSING OCCUPANCY** | | |

| | | |
|---|---|---|
| **Total housing units** | **4,791** | **100.0** |
| Occupied housing units | 4,101 | 85.6 |
| Vacant housing units | 690 | 14.4 |
| For seasonal, recreational, or occasional use | 250 | 5.2 |
| | | |
| Homeowner vacancy rate (percent) | 2.4 | (X) |
| Rental vacancy rate (percent) | 10.5 | (X) |
| | | |
| **HOUSING TENURE** | | |
| **Occupied housing units** | **4,101** | **100.0** |
| Owner-occupied housing units | 3,427 | 83.6 |
| Renter-occupied housing units | 674 | 16.4 |
| | | |
| Average household size of owner-occupied unit | 2.57 | (X) |
| Average household size of renter-occupied unit | 1.83 | (X) |

(X) Not applicable
[1] Other Asian alone, or two or more Asian categories.
[2] Other Pacific Islander alone, or two or more Native Hawaiian and Other Pacific Islander categories.
[3] In combination with one or more other races listed. The six numbers may add to more than the total population and the six percentages may add to more than 100 percent because individuals may report more than one race.
Source: U.S. Census Bureau, Census 2000 Summary File 1, Matrices P1, P3, P4, P8, P9, P12, P13, P,17, P18, P19, P20, P23, P27, P28, P33, PCT5, PCT8, PCT11, PCT15, H1, H3, H4, H5, H11, and H12.

DP-2. **Profile of Selected Social Characteristics: 2000**
Data Set: Census 2000 Summary File 3 (SF 3) - Sample Data
Geographic Area: **Marshall County, Minnesota**

NOTE: Data based on a sample except in P3, P4, H3, and H4. For information on confidentiality protection, sampling error, nonsampling error, definitions, and count corrections see

| Subject | Number | Percent |
|---|---|---|
| Subject | Number | Percent |
| | | |
| **SCHOOL ENROLLMENT** | | |
| **Population 3 years and over enrolled in school** | **2,429** | **100.0** |
| Nursery school, preschool | 152 | 6.3 |
| Kindergarten | 141 | 5.8 |
| Elementary school (grades 1-8) | 1,147 | 47.2 |
| High school (grades 9-12) | 741 | 30.5 |
| College or graduate school | 248 | 10.2 |
| | | |
| **EDUCATIONAL ATTAINMENT** | | |
| **Population 25 years and over** | **6,914** | **100.0** |
| Less than 9th grade | 827 | 12.0 |
| 9th to 12th grade, no diploma | 618 | 8.9 |
| High school graduate (includes equivalency) | 2,557 | 37.0 |
| Some college, no degree | 1,488 | 21.5 |
| Associate degree | 597 | 8.6 |
| Bachelor's degree | 669 | 9.7 |
| Graduate or professional degree | 158 | 2.3 |
| | | |
| Percent high school graduate or higher | 79.1 | (X) |
| Percent bachelor's degree or higher | 12.0 | (X) |
| | | |
| **MARITAL STATUS** | | |
| **Population 15 years and over** | **8,125** | **100.0** |
| Never married | 1,729 | 21.3 |
| Now married, except separated | 5,172 | 63.7 |
| Separated | 55 | 0.7 |
| Widowed | 691 | 8.5 |
| Female | 576 | 7.1 |
| Divorced | 478 | 5.9 |
| Female | 230 | 2.8 |
| | | |
| **GRANDPARENTS AS CAREGIVERS** | | |
| **Grandparent living in household with one or more own grandchildren under 18 years** | **59** | **100.0** |
| Grandparent responsible for grandchildren | 33 | 55.9 |
| | | |
| **VETERAN STATUS** | | |
| **Civilian population 18 years and over** | **7,583** | **100.0** |
| Civilian veterans | 984 | 13.0 |
| | | |
| **DISABILITY STATUS OF THE CIVILIAN NONINSTITUTIONALIZED POPULATION** | | |
| **Population 5 to 20 years** | **2,305** | **100.0** |

| | | |
|---|---|---|
| With a disability | 129 | 5.6 |
| | | |
| **Population 21 to 64 years** | **5,364** | **100.0** |
| With a disability | 822 | 15.3 |
| Percent employed | 59.5 | (X) |
| No disability | 4,542 | 84.7 |
| Percent employed | 79.4 | (X) |
| | | |
| **Population 65 years and over** | **1,786** | **100.0** |
| With a disability | 700 | 39.2 |
| | | |
| **RESIDENCE IN 1995** | | |
| **Population 5 years and over** | **9,564** | **100.0** |
| Same house in 1995 | 6,865 | 71.8 |
| Different house in the U.S. in 1995 | 2,644 | 27.6 |
| Same county | 1,349 | 14.1 |
| Different county | 1,295 | 13.5 |
| Same state | 867 | 9.1 |
| Different state | 428 | 4.5 |
| Elsewhere in 1995 | 55 | 0.6 |
| | | |
| **NATIVITY AND PLACE OF BIRTH** | | |
| **Total population** | **10,155** | **100.0** |
| Native | 9,965 | 98.1 |
| Born in United States | 9,920 | 97.7 |
| State of residence | 7,268 | 71.6 |
| Different state | 2,652 | 26.1 |
| Born outside United States | 45 | 0.4 |
| Foreign born | 190 | 1.9 |
| Entered 1990 to March 2000 | 78 | 0.8 |
| Naturalized citizen | 75 | 0.7 |
| Not a citizen | 115 | 1.1 |
| | | |
| **REGION OF BIRTH OF FOREIGN BORN** | | |
| **Total (excluding born at sea)** | **190** | **100.0** |
| Europe | 29 | 15.3 |
| Asia | 39 | 20.5 |
| Africa | 0 | 0.0 |
| Oceania | 0 | 0.0 |
| Latin America | 81 | 42.6 |
| Northern America | 41 | 21.6 |
| | | |
| **LANGUAGE SPOKEN AT HOME** | | |
| **Population 5 years and over** | **9,564** | **100.0** |
| English only | 8,926 | 93.3 |
| Language other than English | 638 | 6.7 |
| Speak English less than 'very well | 219 | 2.3 |
| Spanish | 263 | 2.7 |
| Speak English less than "very well" | 96 | 1.0 |
| Other Indo-European languages | 352 | 3.7 |
| Speak English less than "very well" | 109 | 1.1 |
| Asian and Pacific Island languages | 21 | 0.2 |
| Speak English less than "very well" | 14 | 0.1 |
| | | |
| **ANCESTRY (single or multiple)** | | |
| **Total population** | **10,155** | **100.0** |
| *Total ancestries reported* | 13,469 | 132.6 |
| Arab | 3 | 0.0 |
| Czech[1] | 324 | 3.2 |
| Danish | 161 | 1.6 |
| | | |

| | | |
|---|---|---|
| Dutch | 84 | 0.8 |
| English | 337 | 3.3 |
| French (except Basque)[1] | 681 | 6.7 |
| French Canadian[1] | 104 | 1.0 |
| German | 1,848 | 18.2 |
| Greek | 4 | 0.0 |
| Hungarian | 10 | 0.1 |
| Irish[1] | 534 | 5.3 |
| Italian | 58 | 0.6 |
| Lithuanian | 6 | 0.1 |
| Norwegian | 4,759 | 46.9 |
| Polish | 1,410 | 13.9 |
| Portuguese | 6 | 0.1 |
| Russian | 33 | 0.3 |
| Scotch-Irish | 65 | 0.6 |
| Scottish | 118 | 1.2 |
| Slovak | 26 | 0.3 |
| Subsaharan African | 3 | 0.0 |
| Swedish | 1,918 | 18.9 |
| Swiss | 18 | 0.2 |
| Ukrainian | 21 | 0.2 |
| United States or American | 144 | 1.4 |
| Welsh | 11 | 0.1 |
| West Indian (excluding Hispanic groups) | 2 | 0.0 |
| Other ancestries | 781 | 7.7 |

(X) Not applicable.
[1] The data represent a combination of two ancestries shown separately in Summary File 3. Czech includes Czechoslovakian. French includes Alsatian. French Canadian includes Acadian/Cajun. Irish includes Celtic.
Ancestry Code List (PDF 35KB)
Place of Birth Code List (PDF 74KB)
Language Code List (PDF 17KB)
Source: U.S. Census Bureau, Census 2000 Summary File 3, Matrices P18, P19, P21, P22, P24, P36, P37, P39, P42, PCT8, PCT16, PCT17, and PCT19

DP-3. **Profile of Selected Economic Characteristics: 2000**
Data Set: Census 2000 Summary File 3 (SF 3) - Sample Data
Geographic Area: **Marshall County, Minnesota**

NOTE: Data based on a sample except in P3, P4, H3, and H4. For information on confidentiality protection, sampling error, nonsampling error, definitions, and count corrections see

| Subject | Number | Percent |
|---|---|---|
| Subject | Number | Percent |
| | | |
| **EMPLOYMENT STATUS** | | |
| **Population 16 years and over** | **7,942** | **100.0** |
| In labor force | 4,957 | 62.4 |
| Civilian labor force | 4,957 | 62.4 |
| Employed | 4,524 | 57.0 |
| Unemployed | 433 | 5.5 |
| Percent of civilian labor force | 8.7 | (X) |
| Armed Forces | 0 | 0.0 |
| Not in labor force | 2,985 | 37.6 |
| | | |
| **Females 16 years and over** | **3,932** | **100.0** |
| In labor force | 2,227 | 56.6 |
| Civilian labor force | 2,227 | 56.6 |
| Employed | 2,089 | 53.1 |
| | | |
| **Own children under 6 years** | **696** | **100.0** |
| All parents in family in labor force | 502 | 72.1 |
| | | |
| **COMMUTING TO WORK** | | |
| **Workers 16 years and over** | **4,460** | **100.0** |
| Car, truck, or van -- drove alone | 3,266 | 73.2 |
| Car, truck, or van -- carpooled | 607 | 13.6 |
| Public transportation (including taxicab) | 1 | 0.0 |
| Walked | 205 | 4.6 |
| Other means | 30 | 0.7 |
| Worked at home | 351 | 7.9 |
| Mean travel time to work (minutes) | 23.2 | (X) |
| | | |
| **Employed civilian population 16 years and over** | **4,524** | **100.0** |
| **OCCUPATION** | | |
| Management, professional, and related occupations | 1,410 | 31.2 |
| Service occupations | 652 | 14.4 |
| Sales and office occupations | 928 | 20.5 |
| Farming, fishing, and forestry occupations | 109 | 2.4 |
| Construction, extraction, and maintenance occupations | 492 | 10.9 |
| Production, transportation, and material moving occupations | 933 | 20.6 |
| | | |
| **INDUSTRY** | | |
| Agriculture, forestry, fishing and hunting, and mining | 527 | 11.6 |
| Construction | 324 | 7.2 |
| Manufacturing | 781 | 17.3 |
| Wholesale trade | 139 | 3.1 |
| | | |

| | | |
|---|---|---|
| Retail trade | 486 | 10.7 |
| Transportation and warehousing, and utilities | 334 | 7.4 |
| Information | 55 | 1.2 |
| Finance, insurance, real estate, and rental and leasing | 156 | 3.4 |
| Professional, scientific, management, administrative, and waste management services | 107 | 2.4 |
| Educational, health and social services | 927 | 20.5 |
| Arts, entertainment, recreation, accommodation and food services | 194 | 4.3 |
| Other services (except public administration) | 277 | 6.1 |
| Public administration | 217 | 4.8 |
| | | |
| **CLASS OF WORKER** | | |
| Private wage and salary workers | 3,164 | 69.9 |
| Government workers | 686 | 15.2 |
| Self-employed workers in own not incorporated business | 630 | 13.9 |
| Unpaid family workers | 44 | 1.0 |
| | | |
| **INCOME IN 1999** | | |
| **Households** | **4,111** | **100.0** |
| Less than $10,000 | 444 | 10.8 |
| $10,000 to $14,999 | 337 | 8.2 |
| $15,000 to $24,999 | 702 | 17.1 |
| $25,000 to $34,999 | 587 | 14.3 |
| $35,000 to $49,999 | 858 | 20.9 |
| $50,000 to $74,999 | 812 | 19.8 |
| $75,000 to $99,999 | 233 | 5.7 |
| $100,000 to $149,999 | 99 | 2.4 |
| $150,000 to $199,999 | 20 | 0.5 |
| $200,000 or more | 19 | 0.5 |
| Median household income (dollars) | 34,804 | (X) |
| | | |
| With earnings | 3,106 | 75.6 |
| Mean earnings (dollars) | 39,301 | (X) |
| With Social Security income | 1,405 | 34.2 |
| Mean Social Security income (dollars) | 10,033 | (X) |
| With Supplemental Security Income | 127 | 3.1 |
| Mean Supplemental Security Income (dollars) | 5,998 | (X) |
| With public assistance income | 107 | 2.6 |
| Mean public assistance income (dollars) | 2,156 | (X) |
| With retirement income | 440 | 10.7 |
| Mean retirement income (dollars) | 14,952 | (X) |
| | | |
| **Families** | **2,859** | **100.0** |
| Less than $10,000 | 124 | 4.3 |
| $10,000 to $14,999 | 159 | 5.6 |
| $15,000 to $24,999 | 377 | 13.2 |
| $25,000 to $34,999 | 414 | 14.5 |
| $35,000 to $49,999 | 708 | 24.8 |
| $50,000 to $74,999 | 740 | 25.9 |
| $75,000 to $99,999 | 222 | 7.8 |
| $100,000 to $149,999 | 85 | 3.0 |
| $150,000 to $199,999 | 16 | 0.6 |
| $200,000 or more | 14 | 0.5 |
| Median family income (dollars) | 41,908 | (X) |
| | | |
| Per capita income (dollars) | 16,317 | (X) |
| ***Median earnings (dollars):*** | | |
| Male full-time, year-round workers | 30,051 | (X) |
| Female full-time, year-round workers | 20,600 | (X) |
| | | |
| **POVERTY STATUS IN 1999 (below poverty level)** | | |

| | | |
|---|---|---|
| **Families** | **197** | **(X)** |
| Percent below poverty level | (X) | 6.9 |
| With related children under 18 years | 114 | (X) |
| Percent below poverty level | (X) | 8.8 |
| With related children under 5 years | 59 | (X) |
| Percent below poverty level | (X) | 12.2 |
| | | |
| **Families with female householder, no husband present** | **41** | **(X)** |
| Percent below poverty level | (X) | 19.6 |
| With related children under 18 years | 38 | (X) |
| Percent below poverty level | (X) | 27.0 |
| With related children under 5 years | 19 | (X) |
| Percent below poverty level | (X) | 35.2 |
| | | |
| **Individuals** | **979** | **(X)** |
| Percent below poverty level | (X) | 9.8 |
| 18 years and over | 670 | (X) |
| Percent below poverty level | (X) | 9.0 |
| 65 years and over | 229 | (X) |
| Percent below poverty level | (X) | 12.8 |
| Related children under 18 years | 286 | (X) |
| Percent below poverty level | (X) | 11.3 |
| Related children 5 to 17 years | 203 | (X) |
| Percent below poverty level | (X) | 10.4 |
| Unrelated individuals 15 years and over | 332 | (X) |
| Percent below poverty level | (X) | 22.9 |

(X) Not applicable.
Detailed Occupation Code List (PDF 42KB)
Detailed Industry Code List (PDF 44KB)
User note on employment status data (PDF 63KB)
Source: U.S. Census Bureau, Census 2000 Summary File 3, Matrices P30, P32, P33, P43, P46, P49, P50, P51, P52, P53, P58, P62, P63, P64, P65, P67, P71, P72, P73, P74, P76, P77, P82, P87, P90, PCT47, PCT52, and PCT53

DP-4. **Profile of Selected Housing Characteristics: 2000**
Data Set: Census 2000 Summary File 3 (SF 3) - Sample Data
Geographic Area: **Marshall County, Minnesota**

NOTE: Data based on a sample except in P3, P4, H3, and H4. For information on confidentiality protection, sampling error, nonsampling error, definitions, and count corrections see

| Subject | Number | Percent |
|---|---|---|
| Subject | Number | Percent |
| | | |
| **Total housing units** | **4,791** | **100.0** |
| **UNITS IN STRUCTURE** | | |
| 1-unit, detached | 3,694 | 77.1 |
| 1-unit, attached | 36 | 0.8 |
| 2 units | 44 | 0.9 |
| 3 or 4 units | 31 | 0.6 |
| 5 to 9 units | 154 | 3.2 |
| 10 to 19 units | 41 | 0.9 |
| 20 or more units | 123 | 2.6 |
| Mobile home | 663 | 13.8 |
| Boat, RV, van, etc. | 5 | 0.1 |
| | | |
| **YEAR STRUCTURE BUILT** | | |
| 1999 to March 2000 | 47 | 1.0 |
| 1995 to 1998 | 175 | 3.7 |
| 1990 to 1994 | 163 | 3.4 |
| 1980 to 1989 | 474 | 9.9 |
| 1970 to 1979 | 1,102 | 23.0 |
| 1960 to 1969 | 471 | 9.8 |
| 1940 to 1959 | 799 | 16.7 |
| 1939 or earlier | 1,560 | 32.6 |
| | | |
| **ROOMS** | | |
| 1 room | 29 | 0.6 |
| 2 rooms | 92 | 1.9 |
| 3 rooms | 387 | 8.1 |
| 4 rooms | 660 | 13.8 |
| 5 rooms | 1,031 | 21.5 |
| 6 rooms | 901 | 18.8 |
| 7 rooms | 658 | 13.7 |
| 8 rooms | 507 | 10.6 |
| 9 or more rooms | 526 | 11.0 |
| Median (rooms) | 5.7 | (X) |
| | | |
| **Occupied Housing Units** | **4,101** | **100.0** |
| **YEAR HOUSEHOLDER MOVED INTO UNIT** | | |
| 1999 to March 2000 | 334 | 8.1 |
| 1995 to 1998 | 892 | 21.8 |
| 1990 to 1994 | 601 | 14.7 |
| 1980 to 1989 | 748 | 18.2 |
| 1970 to 1979 | 751 | 18.3 |
| 1969 or earlier | 775 | 18.9 |
| | | |

| | | |
|---|---|---|
| **VEHICLES AVAILABLE** | | |
| None | 213 | 5.2 |
| 1 | 1,113 | 27.1 |
| 2 | 1,763 | 43.0 |
| 3 or more | 1,012 | 24.7 |
| | | |
| **HOUSE HEATING FUEL** | | |
| Utility gas | 833 | 20.3 |
| Bottled, tank, or LP gas | 956 | 23.3 |
| Electricity | 1,110 | 27.1 |
| Fuel oil, kerosene, etc. | 946 | 23.1 |
| Coal or coke | 0 | 0.0 |
| Wood | 231 | 5.6 |
| Solar energy | 0 | 0.0 |
| Other fuel | 4 | 0.1 |
| No fuel used | 21 | 0.5 |
| | | |
| **SELECTED CHARACTERISTICS** | | |
| Lacking complete plumbing facilities | 30 | 0.7 |
| Lacking complete kitchen facilities | 25 | 0.6 |
| No telephone service | 78 | 1.9 |
| | | |
| **OCCUPANTS PER ROOM** | | |
| **Occupied housing units** | **4,101** | **100.0** |
| 1.00 or less | 4,014 | 97.9 |
| 1.01 to 1.50 | 63 | 1.5 |
| 1.51 or more | 24 | 0.6 |
| | | |
| **Specified owner-occupied units** | **1,854** | **100.0** |
| **VALUE** | | |
| Less than $50,000 | 915 | 49.4 |
| $50,000 to $99,999 | 803 | 43.3 |
| $100,000 to $149,999 | 91 | 4.9 |
| $150,000 to $199,999 | 26 | 1.4 |
| $200,000 to $299,999 | 13 | 0.7 |
| $300,000 to $499,999 | 2 | 0.1 |
| $500,000 to $999,999 | 2 | 0.1 |
| $1,000,000 or more | 2 | 0.1 |
| Median (dollars) | 50,500 | (X) |
| | | |
| **MORTGAGE STATUS AND SELECTED MONTHLY OWNER COSTS** | | |
| With a mortgage | 919 | 49.6 |
| Less than $300 | 20 | 1.1 |
| $300 to $499 | 202 | 10.9 |
| $500 to $699 | 315 | 17.0 |
| $700 to $999 | 259 | 14.0 |
| $1,000 to $1,499 | 103 | 5.6 |
| $1,500 to $1,999 | 11 | 0.6 |
| $2,000 or more | 9 | 0.5 |
| Median (dollars) | 651 | (X) |
| Not mortgaged | 935 | 50.4 |
| Median (dollars) | 241 | (X) |
| | | |
| **SELECTED MONTHLY OWNER COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN 1999** | | |
| Less than 15 percent | 1,034 | 55.8 |
| 15 to 19 percent | 290 | 15.6 |
| 20 to 24 percent | 173 | 9.3 |
| 25 to 29 percent | 114 | 6.1 |
| 30 to 34 percent | 71 | 3.8 |

| | | |
|---|---|---|
| 35 percent or more | 160 | 8.6 |
| Not computed | 12 | 0.6 |
| | | |
| **Specified renter-occupied units** | **579** | **100.0** |
| **GROSS RENT** | | |
| Less than $200 | 120 | 20.7 |
| $200 to $299 | 97 | 16.8 |
| $300 to $499 | 199 | 34.4 |
| $500 to $749 | 52 | 9.0 |
| $750 to $999 | 5 | 0.9 |
| $1,000 to $1,499 | 4 | 0.7 |
| $1,500 or more | 2 | 0.3 |
| No cash rent | 100 | 17.3 |
| Median (dollars) | 317 | (X) |
| | | |
| **GROSS RENT AS A PERCENTAGE OF HOUSEHOLD INCOME IN 1999** | | |
| Less than 15 percent | 140 | 24.2 |
| 15 to 19 percent | 52 | 9.0 |
| 20 to 24 percent | 81 | 14.0 |
| 25 to 29 percent | 64 | 11.1 |
| 30 to 34 percent | 34 | 5.9 |
| 35 percent or more | 100 | 17.3 |
| Not computed | 108 | 18.7 |

(X) Not applicable.
Source: U.S. Census Bureau, Census 2000 Summary File 3, Matrices H1, H7, H20, H23, H24, H30, H34, H38, H40, H43, H44, H48, H51, H62, H63, H69, H74, H76, H90, H91, and H94

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# Data and Statistics

## Quick Stats (ag statistics database)

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Select U.S. and State level data for various agricultural goods, or only query a specific state.

Select a U.S & All States Query Go

Go to Individual States Data for: (Select State & Type)

Select State | Select State specific Query Go

**State and County Data**
Select county level data for all U.S. counties or the counties of a specific state(s).

Select a All States - County Query Go

Go to Individual States Data for: (Select State & Type)

Select State | Select a All States - County Query Go

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Query results from the 2007, 2002 and 1997 Censuses of Agriculture. Click here for additional Census of Agriculture data and publications.

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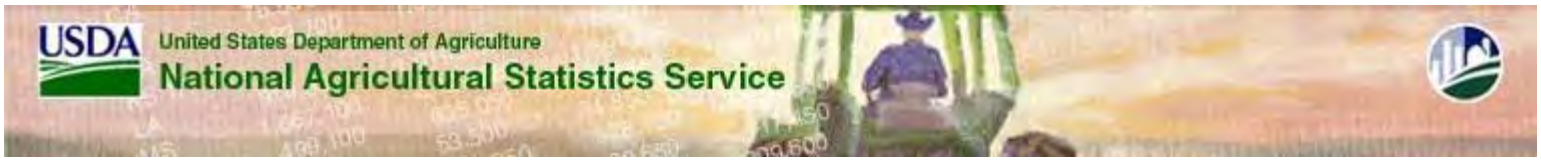




# USDA National Agricultural Statistics Service - Quick Stats
## Minnesota County Data - Crops

step 1 select data items

- Barley All
- Beans Dry Edible
- Canola
- Corn For Grain
- Corn For Silage
- Hay All (Dry)

step 2 select data practices

- All Practices
- Irrigated
- Non Irrigated: Continuous Cropping

step 3 select years

step 4 select location

**Click the Add button to select Location(s).** Select multiple locations by clicking on a location while pressing the Ctrl key, and then clicking on another location(s).

**Select Years:**

**From:** 2007

**To:** 2008

**Interval:** 1

**Primary Location:**

Minnesota

**Secondary Location(s):**

- Make Selection Below
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- State Total
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- Anoka
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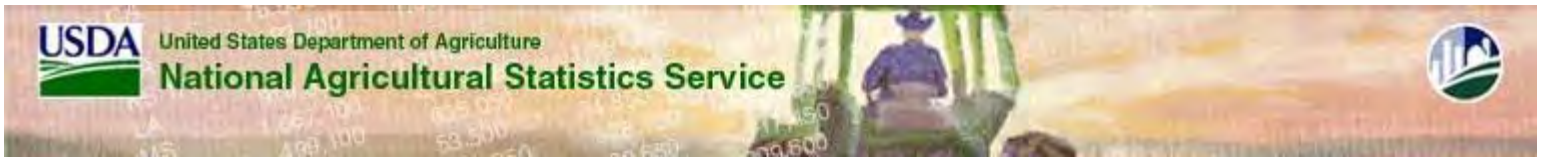




# USDA National Agricultural Statistics Service - Quick Stats
## Minnesota County Data - Crops

step 1 select data items

Barley All
Beans Dry Edible
Canola
Corn For Grain
Corn For Silage
Hay All (Dry)

step 2 select data practices

All Practices
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**To:** 2008

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Minnesota

**Secondary Location(s):**

Make Selection Below
All Counties & Districts
All Counties
All Districts
State Total
Aitkin
Anoka
Beltrami

Add

**Location(s) Selected**

Click Location to Remove

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## Minnesota County Data - Crops

| Commodity ? | Practice | Year | State | County | District | Planted All Purposes | Harvested | Yield | Production |
|---|---|---|---|---|---|---|---|---|---|
| Barley All | Total For Crop | 2000 | Minnesota | Marshall | 10 | 49,500 acres | 46,900 acres | 64 bushel | 3,001,600 bushel |
| Barley All | Total For Crop | 2001 | Minnesota | Marshall | 10 | 28,100 acres | 27,300 acres | 56 bushel | 1,528,800 bushel |
| Barley All | Total For Crop | 2002 | Minnesota | Marshall | 10 | 38,900 acres | 35,500 acres | 41 bushel | 1,455,500 bushel |
| Barley All | Total For Crop | 2003 | Minnesota | Marshall | 10 | 41,600 acres | 39,900 acres | 81.2 bushel | 3,240,000 bushel |
| Barley All | Total For Crop | 2004 | Minnesota | Marshall | 10 | 31,100 acres | 28,500 acres | 66 bushel | 1,881,000 bushel |
| Barley All | Total For Crop | 2005 | Minnesota | Marshall | 10 | 28,300 acres | 21,500 acres | 38 bushel | 817,000 bushel |
| Barley All | Total For Crop | 2006 | Minnesota | Marshall | 10 | 23,100 acres | 20,800 acres | 61 bushel | 1,268,800 bushel |
| Barley All | Total For Crop | 2007 | Minnesota | Marshall | 10 | 32,900 acres | 30,000 acres | 58 bushel | 1,740,000 bushel |
| Barley All | Total For Crop | 2008 | Minnesota | Marshall | 10 | 28,100 acres | 26,000 acres | 72.2 bushel | 1,878,000 bushel |

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## U.S. & All States County Data - Livestock

| Commodity ? | Year | State | County | District | Cattle All | Beef Cows | Milk Cows |
|---|---|---|---|---|---|---|---|
| Cattle & Calves | 2000 | Minnesota | Marshall | 10 | 18,000 head | 6,000 head | 1,900 head |
| Cattle & Calves | 2001 | Minnesota | Marshall | 10 | 18,000 head | 6,100 head | 1,900 head |
| Cattle & Calves | 2002 | Minnesota | Marshall | 10 | 16,000 head | 6,000 head | 1,800 head |
| Cattle & Calves | 2003 | Minnesota | Marshall | 10 | 16,000 head | 5,900 head | 1,800 head |
| Cattle & Calves | 2004 | Minnesota | Marshall | 10 | 15,500 head | 5,900 head | 600 head |
| Cattle & Calves | 2005 | Minnesota | Marshall | 10 | 16,000 head | 5,900 head | 500 head |
| Cattle & Calves | 2006 | Minnesota | Marshall | 10 | 16,000 head | 6,300 head | 500 head |
| Cattle & Calves | 2007 | Minnesota | Marshall | 10 | 16,000 head | 6,400 head | 1,300 head |
| Cattle & Calves | 2008 | Minnesota | Marshall | 10 | 17,000 head | 6,800 head | |

9 Records displayed

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# Data and Statistics

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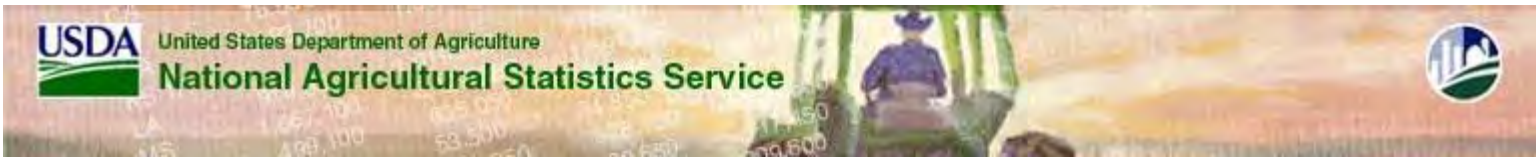




# USDA National Agricultural Statistics Service - Quick Stats
## Minnesota County Data - Livestock

step 1 select data items

- Barley All
- Beans Dry Edible
- Canola
- Corn For Grain
- Corn For Silage

step 2 select years

step 3 select location

**Click the Add button to select Location(s).** Select multiple locations by clicking on a location while pressing the Ctrl key, and then clicking on another location(s).

**Select Years:**

**From:** 2007

**To:** 2008

**Interval:** 1

**Primary Location:**

Minnesota

**Secondary Location(s):**

- Make Selection Below
- All Counties & Districts
- All Counties
- All Districts
- State Total
- Aitkin
- Anoka
- Beltrami

Add

**Location(s) Selected**

Click Location to Remove

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- (•) English Units (acres, cubic feet, pounds)
- ( ) Metric Units (hectares, cubic meters, kilograms)

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In this section you will choose the state and counties to be included in the database retrieval. For each state the user must select one of the following options: (1) "No Selection" (the default mode),or (2) "All Counties" (which will include all counties), or (3) "Specific Counties", which must be followed by the selection of only the counties of interest. (Note: The method to choose multiple items in a select list will vary depending on your web browser, such as holding down the CTRL key as you click on your choices. You may also be able to deselect an item by holding down the CTRL key and clicking on the item.)

**State and County Selection Table**

**Alabama** 2007 RPA Year
- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

01001 Autauga
01003 Baldwin
01005 Barbour
01007 Bibb
01011 Bullock

**Alaska** 2007 RPA Year
- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

02013 Aleutians East
02016 Aleutians West
02020 Anchorage
02050 Bethel
02070 Dillingham

**Arizona** 2007 RPA Year
- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

04001 Apache
04003 Cochise
04005 Coconino
04007 Gila
04011 Greenlee

**Arkansas** 2007 RPA Year
- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

05001 ARKANSAS
05003 ASHLEY
05005 BAXTER
05007 BENTON
05011 BRADLEY

**California** 2007 RPA Year
- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

06001 Alameda
06003 Alpine
06005 Amador
06007 Butte
06011 Colusa

**Colorado** 2007 RPA Year
- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

08003 Alamosa
08005 Arapahoe
08007 Archuleta
08013 Boulder
08019 Clear Creek

**Connecticut** 2007 RPA Year

**Florida** 2007 RPA Year

2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

09001 Fairfield
09003 Hartford
09005 Litchfield
09007 Middlesex
09011 New London

**Delaware** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

10001 Kent
10003 New Castle
10005 Sussex

2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

12001 ALACHUA
12003 BAKER
12005 BAY
12007 BRADFORD
12011 BROWARD

**Georgia** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

13001 APPLING
13003 ATKINSON
13005 BACON
13007 BAKER
13011 BANKS

**Idaho** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

16001 Ada
16003 Adams
16005 Bannock
16007 Bear Lake
16011 Bingham

**Illinois** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

17001 Adams
17003 Alexander
17005 Bond
17007 Boone
17011 Bureau

**Indiana** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

18001 Adams
18003 Allen
18005 Bartholomew
18007 Benton
18011 Boone

**Iowa** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

19001 Adair
19003 Adams
19005 Allamakee
19007 Appanoose
19011 Benton

**Kansas** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

20001 Allen
20003 Anderson
20005 Atchison
20007 Barber
20011 Bourbon

**Kentucky** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

21001 ADAIR
21003 ALLEN
21005 ANDERSON
21007 BALLARD
21011 BATH

**Louisiana** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

22001 Acadia
22003 Allen
22005 Ascension
22007 Assumption
22011 Beauregard

**Maine** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

23001 Androscoggin
23003 Aroostook
23005 Cumberland
23007 Franklin
23011 Kennebec

**Maryland** 2007 RPA Year

- ◉ No Selection
- ○ All Counties
- ○ Specific Counties (You must choose one or more of the following counties)

24001 Allegany
24003 Anne Arundel
24005 Baltimore
24009 Calvert
24013 Carroll

**Massachusetts** 2007 RPA Year

- ◉ No Selection
- ○ All Counties
- ○ Specific Counties (You must choose one or more of the following counties)

25001 Barnstable
25003 Berkshire
25005 Bristol
25007 Dukes
25011 Franklin

**Michigan** 2007 RPA Year

- ◉ No Selection
- ○ All Counties
- ○ Specific Counties (You must choose one or more of the following counties)

26001 ALCONA
26003 ALGER
26005 ALLEGAN
26007 ALPENA
26011 ARENAC

**Minnesota** 2007 RPA Year

- ◉ No Selection
- ○ All Counties
- ○ Specific Counties (You must choose one or more of the following counties)

27001 AITKIN
27003 ANOKA
27005 BECKER
27007 BELTRAMI
27011 BIG STONE

**Mississippi** 2007 RPA Year

- ◉ No Selection
- ○ All Counties
- ○ Specific Counties (You must choose one or more of the following counties)

28001 ADAMS
28003 ALCORN
28005 AMITE
28007 ATTALA
28011 BOLIVAR

**Missouri** 2007 RPA Year

- ◉ No Selection
- ○ All Counties
- ○ Specific Counties (You must choose one or more of the following counties)

29001 Adair
29003 Andrew
29005 Atchison
29007 Audrain
29011 Barton

**Montana** 2007 RPA Year

- ◉ No Selection
- ○ All Counties
- ○ Specific Counties (You must choose one or more of the following counties)

30001 Beaverhead
30003 Big Horn
30005 Blaine
30007 Broadwater
30011 Carter

**Nebraska** 2007 RPA Year

- ◉ No Selection
- ○ All Counties
- ○ Specific Counties (You must choose one or more of the following counties)

31001 Adams
31003 Antelope
31005 Arthur
31007 Banner
31011 Boone

**Nevada** 2007 RPA Year

- ◉ No Selection
- ○ All Counties
- ○ Specific Counties (You must choose one or more of the following counties)

32001 Churchill
32003 Clark
32005 Douglas
32007 Elko
32011 Eureka

**New Hampshire** 2007 RPA Year

- ◉ No Selection
- ○ All Counties
- ○ Specific Counties (You must choose one or more of the following counties)

33001 Belknap
33003 Carroll
33005 Cheshire
33007 Coos
33009 Grafton

**New Jersey** 2007 RPA Year

- ◉ No Selection
- ○ All Counties
- ○ Specific Counties (You must choose one or more of the following counties)

34001 Atlantic
34003 Bergen
34005 Burlington
34007 Camden
34011 Cumberland

**New Mexico** 2007 RPA Year

- ◉ No Selection
- ○ All Counties
- ○ Specific Counties (You must choose one or more of the following counties)

35001 Bernalillo
35003 Catron
35005 Chaves
35006 Cibola

33001 Belknap
33003 Carroll
33005 Cheshire
33007 Coos
33011 Hillsborough

34003 Bergen
34005 Burlington
34007 Camden
34009 Cape May
34011 Cumberland

35001 Bernalillo
35003 Catron
35005 Chaves
35006 Cibola
35007 Colfax
35009 Curry

**New York** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

36001 Albany
36003 Allegany
36005 Bronx
36007 Broome
36011 Cayuga

**North Carolina** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

37001 ALAMANCE
37003 ALEXANDER
37005 ALLEGHANY
37007 ANSON
37011 AVERY

**North Dakota** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

38001 Adams
38003 Barnes
38005 Benson
38007 Billings
38011 Bowman

**Ohio** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

39001 Adams
39003 Allen
39005 Ashland
39007 Ashtabula
39011 Auglaize

**Oklahoma** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

40001 Adair
40005 Atoka
40013 Bryan
40021 Cherokee
40029 Coal

**Oregon** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

41001 Baker
41003 Benton
41005 Clackamas
41007 Clatsop
41011 Coos

**Pennsylvania** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

42001 Adams
42003 Allegheny
42005 Armstrong
42007 Beaver
42011 Berks

**Rhode Island** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

44001 Bristol
44003 Kent
44005 Newport
44007 Providence

**South Carolina** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

45001 ABBEVILLE
45003 AIKEN
45005 ALLENDALE
45007 ANDERSON
45011 BARNWELL

**South Dakota** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following

**Tennessee** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

**Texas** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the

counties)

46003 Aurora
46005 Beadle
46007 Bennet
46009 Bon Homme
46013 Brown

47001 Anderson
47003 Bedford
47005 Benton
47007 Bledsoe
47011 Bradley

following counties)

48001 Anderson
48005 Angelina
48037 Bowie
48063 Camp
48071 Chambers

**Utah** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

49001 Beaver
49003 Box Elder
49005 Cache
49007 Carbon
49011 Davis

**Vermont** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

50001 Addison
50003 Bennington
50005 Caledonia
50007 Chittenden
50011 Franklin

**Virginia** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

51001 ACCOMACK
51003 ALBEMARLE
51005 ALLEGHANY
51007 AMELIA
51011 APPOMATTOX

**Washington** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

53001 Adams
53003 Asotin
53005 Benton
53007 Chelan
53011 Clark

**West Virginia** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

54001 Barbour
54003 Berkeley
54005 Boone
54007 Braxton
54011 Cabell

**Wisconsin** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

55001 Adams
55003 Ashland
55005 Barron
55007 Bayfield
55011 Buffalo

**Wyoming** 2007 RPA Year

- (•) No Selection
- ( ) All Counties
- ( ) Specific Counties (You must choose one or more of the following counties)

56001 Albany
56003 Big Horn
56005 Campbell
56007 Carbon
56011 Crook

Continue

I already have the data and want to create a map.

# Timber Products Output Mapmaker Version 1.0

## Attribute of Interest (page 2 of 4)
## SessionID=371425244

### Attribute of Interest(choose one)

**Note on retrieval times: The amount of time it takes to complete a retrieval is determined primarily by the size of the geographic area in question and the type of attribute being reported. Retrieving the "42 standard tables" for a large state may take as long as 20 minutes. In general the "42 standard tables" option should only be run for areas smaller in size than a state.**

- 42 standard tables
- Volume of roundwood product(cuft)
- Volume of logging residue(cuft)
- Volume of other removals(cuft)

**Volume of roundwood product from Growing-stock inventory(cuft)**

### Would you like to add an optional filter?

- ○ yes
- ◉ no

Continue

# Timber Products Output Mapmaker Version 1.0

## Page,Row and Column of Interest (page 3 of 4)
## SessionID=371425244

### Page variable

- None
- County code
- Major species group
- Ownership class

Source

### Row variable (Select "County code" to generate a map)

- County code
- Major species group
- Ownership class
- Product

Species group

### Column variable

- County code
- Major species group
- Ownership class
- Product

Species group

### Would you like to eliminate empty pages?

- (•) yes
- ( ) no

#### Would you like to eliminate empty rows?

- (•) yes
- ( ) no

##### Would you like to eliminate empty columns?

- (•) yes
- ( ) no

Continue

# Timber Products Output Mapmaker Version 1.0

## Internet address of your retrieval's output
## SessionID=371425244

**If this retrieval takes more than 5 minutes your browser may timeout. Even though your browser has timed out your retrieval will continue to run. The table generated by your retrieval can be viewed at a later time by typing the following information on your browser address line: http://ncrs2.fs.fed.us/4801/fiadb/temp2/j409502131.htm**

You can generate a map based on your retrieval by typing the following information on your browser address line:
http://ncrs2.fs.fed.us/scripts/esrimap.dll?name=forest_inventory_mapmaker&cmd=map&datestamp=j4095021&"

Continue

# Timber Products Output Mapmaker Version 1.0

## Results page (page 4 of 4)

Geographic area of interest is Minnesota 2007 RPA Year: AITKIN, .
The attribute of interest is Volume of logging residue(cuft).
No filters were used.
Pages are None.
Rows are County code.
Columns are Major species group.
The data base includes information which may have been collected in a slightly different way from one state to another. When information is collected that crosses state boundaries the user may want to check with respective FIA units for possible differences.

---

View table: 1. table ncrs2.fs.fed.us/4801/fiadb/temp2/j409502131.htm

Create Map

View SQL code: 1. tablencrs2.fs.fed.us/4801/fiadb/temp2/j409502151.htm

# Timber Products Output Mapmaker Version 1.0

**Geographic area of interest is Minnesota 2007 RPA Year: AITKIN, .**
**The attribute of interest is Volume of logging residue(cuft).**
**No filters were used.**
**Pages are None.**
**Rows are County code.**
**Columns are Major species group.**

| Two-way table (rows and columns) | | | |
|---|---|---|---|
| | TotalMajor species group | Softwoods | Hardwoods |
| 27001 AITKIN | 8,288,260 | 1,192,243 | 7,096,017 |
| Total County code | 8,288,260 | 1,192,243 | 7,096,017 |

2/24/2009 9:50:58 AM
View comma delimited table: 1. table ncrs2.fs.fed.us/4801/fiadb/temp2/j409502111.htm

# Vehicle Miles



**Other Roadway Data Pages**

**Roadway Data**
Roadway History, Roadlog, Control Section, Project Logs and TIS.

**Statewide Mileage and Lane Miles**
Only recent TIS information is kept available, for the purpose of generating summaries of mileage and lane mileage. However, the web page contains all of the historical summaries that were generated since 2002.

**Construction Project Log**
An index of all construction projects on an individual trunk highway beginning with the first known work.

**Trunk Highway Log Point**
The Log Point file is a sequential listing of landmarks like intersections, RR-xing's, city limit boundaries, bridges, etc. that you would cross as you drive along the road in the increasing Reference Post direction.

## Vehicle Miles

Daily (Average) and Annual (Total) Vehicle Miles summarized in a variety of ways.

The far right column represents recent centerline mileage.

- ○ VMT by County / Route System and Route System Only
- ○ VMT by County / City / Route System
- ○ VMT by District / Metro Division and Route System (Trunk Highways Only)
- ◉ VMT by County / Surface Type
- ○ Heavy Commercial VMT by Construction District / Metro Division & Route System (Trunk Highways Only)
- ○ VMT by County / Functional Class and Functional Class Only (Does not exist before 2006)

2007 [View Report in PDF Format]

- ◉ VMT by County / Route System
- ○ VMT by County / City / Route System

by year [View Report in Excel Format]

>
> MAJOR CHANGE TO THE TIS DATABASE:
> ---------------------------------
> IN LATE-SPRING OF 2008, TDA IMPLIMENTED A PROJECT TO UPDATE LOCAL
>  ROADS IN THE TIS SYSTEM, BASED ON DATA FOUND IN THE GIS BASEMAP.
>
> THIS PROJECT RESULTED IN THE ADDITION OF OVER 5,000 MILES OF ROADS.
>  THE MAJORITY OF THE INCREASE OCCURRED IN THE MUNICIPAL ROAD AND
>  TOWNSHIP ROAD SYSTEMS (RESPECTIVELY, 46% AND 30% OF THE TOTAL
>  GROWTH).
>
> THE CHANGES IN MILEAGES IN THE LOCAL ROAD CLASSES BETWEEN JUNE 2007
>  AND JUNE 2008 ARE PRIMARILY THE RESULT OF THE UPDATE PROCESS,
>  AND NOT THE BUILDING OF NEW ROADS.
>
> IN ADDITION TO THE EFFECT ON THE LATEST MILEAGE FIGURES, THERE IS A
>  CORRESPONDING EFFECT ON THE LATEST FIGURES FOR LANE MILEAGE AND
>  VEHICLE MILEAGE (VMT).
>
>
> GENERAL ISSUES:
> ---------------
> THE TRANSPORTATION INFORMATION SYSTEM (TIS) DATABASE UNDERGOES ONGOING
>  REVISIONS, RESULTING IN FREQUENT VARIATIONS IN THE INFORMATION
>  PROVIDED ON TIS REPORTS.
>
> TO PROVIDE CONSISTENCY, A NEW REPORTING PROCESS WAS INSTITUTED IN
>  2001. EACH MID-YEAR, FOLLOWING THE FINAL APPROVAL OF THE TRAFFIC
>  VOLUME DATA, A "SNAPSHOT" OF THE DATABASE IS TAKEN. ALL TIS REPORTS
>  ON VMT AND MILEAGE/LANE MILEAGE (AND A FEW OTHERS) ARE THEN BASED ON
>  THOSE OFFICIAL ANNUAL VERSIONS OF THE DATABASE.
>
> THE LATEST STATISTICS AND LISTINGS ON THE TDA WEB PAGE ARE BASED
>  ON THE TIS DATA FROM JULY 3, 2008.
>
> AD HOC REPORTS ON VMT AND MILEAGE/LANE MILEAGE (AND SOME LIST REPORTS)
>  ARE ALSO BASED ON THAT DATA.
>
> INFORMATION SUPPLIED BY FEDERAL OR LOCAL AGENCIES, OTHER STATE
>  AGENCIES, OR OTHER SOURCES MAY VARY FROM THE INFORMATION PROVIDED
>  THROUGH TIS. AMONG THE REASONS ARE: DIFFERENCES IN DATA DEFINITIONS,
>  TIMING OF REPORTING, AND OTHER FACTORS.

>
>
> VMT ISSUES:
> -----------
> WHEN TRAFFIC VOLUME MEASURES ARE MISSING FOR INDIVIDUAL SECTIONS OF
>  ROAD IN A GIVEN YEAR, TRAFFIC VOLUMES FROM AN EARLIER YEAR ARE
>  SUBSTITUTED FOR THE PURPOSE OF VMT CALCULATION. THEREFORE, THIS
>  REPORT MAY NOT REFLECT THE ACTUAL TRAFFIC VOLUMES FROM 2007, IN
>  ALL CASES.
>
> HISTORICAL MILEAGE, CORRESPONDING TO THE TRAFFIC VOLUME YEAR, IS
>  NEVER EMPLOYED FOR VMT CALCULATION. THE MILEAGE APPLIED IS ALWAYS
>  MORE RECENT. (THE MILEAGE USED TO DETERMINE THE 2007 VMT FIGURES
>  IS FROM JULY 3, 2008).
>
> THE VMT REPORTS ARE LABELED AS 2007, ACCORDING TO THE TRAFFIC
>  VOLUME YEAR. THE MILEAGE / LANE MILEAGE REPORTS, ON THE OTHER HAND,
>  ARE LABELED AS 2008.
>

2007 DAILY (AVERAGE) AND ANNUAL (TOTAL) VEHICLE MILES ---
GROUPED BY SURFACE TYPE FOR EACH COUNTY

KEY (SURF-TYPE-RD1): BT=BITUMINOUS, CN=CONCRETE, DT=DIRT/SOIL,
GV=GRAVEL, BB=BRICK/BLOCK, UN=UNKNOWN/UNCODED

TRAFFIC-MATRIX-SUMMARY JUL 14,2008

ALL ROADWAYS

| RLG.COUNTY | RLG.SURF-TYPE-RD1 | AVERAGE VEH. MILES PER DAY OR PART DAY ALL VEHICLES | TOTAL VEH. MILES FOR PERIOD SELECTED ALL VEHICLES | MILES |
|---|---|---|---|---|
| 01 - AITKIN | BT | 654,423 | 238,864,395 | 495.147 |
| 01 - AITKIN | CN | 269 | 98,185 | 0.070 |
| 01 - AITKIN | DT | 6,404 | 2,337,460 | 182.262 |

| | | | | |
|---|---|---|---|---|
| 01 - AITKIN | GV | 68,304 | 24,930,960 | 1,004.805 |
| 01 - AITKIN | UN | 9,812 | 3,581,380 | 106.701 |
| 01 - AITKIN | -----SUBTOTAL-------> | 739,213 | 269,812,380 | 1,788.985 |
| | | | | |
| 02 - ANOKA | BB | 931 | 339,815 | 1.034 |
| 02 - ANOKA | BT | 7,332,848 | 2,676,489,520 | 1,817.645 |
| 02 - ANOKA | CN | 800,655 | 292,239,075 | 21.004 |
| 02 - ANOKA | DT | 24,188 | 8,828,620 | 11.772 |
| 02 - ANOKA | GV | 146,058 | 53,311,170 | 373.317 |
| 02 - ANOKA | UN | 50,431 | 18,407,315 | 73.483 |
| 02 - ANOKA | -----SUBTOTAL-------> | 8,355,111 | 3,049,615,515 | 2,298.255 |
| | | | | |
| 03 - BECKER | BB | 21 | 7,665 | 0.050 |
| 03 - BECKER | BT | 982,288 | 358,535,120 | 748.398 |
| 03 - BECKER | DT | 5,525 | 2,016,625 | 163.091 |
| 03 - BECKER | GV | 81,995 | 29,928,175 | 1,189.107 |
| 03 - BECKER | UN | 6,275 | 2,290,375 | 80.799 |
| 03 - BECKER | -----SUBTOTAL-------> | 1,076,103 | 392,777,960 | 2,181.445 |
| | | | | |
| 04 - BELTRAMI | BB | 7,563 | 2,760,495 | 6.050 |
| 04 - BELTRAMI | BT | 1,017,879 | 371,525,835 | 708.564 |
| 04 - BELTRAMI | DT | 13,851 | 5,055,615 | 274.885 |
| 04 - BELTRAMI | GV | 92,230 | 33,663,950 | 1,181.159 |
| 04 - BELTRAMI | UN | 25,072 | 9,151,280 | 258.346 |
| 04 - BELTRAMI | -----SUBTOTAL-------> | 1,156,596 | 422,157,175 | 2,429.004 |
| | | | | |
| 05 - BENTON | BT | 968,669 | 353,564,185 | 530.214 |
| 05 - BENTON | CN | 349,332 | 127,506,180 | 15.034 |
| 05 - BENTON | DT | 1,477 | 539,105 | 26.779 |
| 05 - BENTON | GV | 32,197 | 11,751,905 | 372.294 |
| 05 - BENTON | UN | 16,448 | 6,003,520 | 30.879 |
| 05 - BENTON | -----SUBTOTAL-------> | 1,368,124 | 499,364,895 | 975.200 |
| | | | | |
| 06 - BIG STONE | BB | 96 | 35,040 | 0.230 |
| 06 - BIG STONE | BT | 151,896 | 55,442,040 | 279.068 |
| 06 - BIG STONE | CN | 4,405 | 1,607,825 | 1.491 |
| 06 - BIG STONE | DT | 2,269 | 828,185 | 64.412 |
| 06 - BIG STONE | GV | 27,847 | 10,164,155 | 613.200 |
| 06 - BIG STONE | UN | 326 | 118,990 | 0.782 |
| 06 - BIG STONE | -----SUBTOTAL-------> | 186,839 | 68,196,235 | 959.183 |
| | | | | |
| 07 - BLUE EARTH | BB | 1,086 | 396,390 | 1.545 |

| | | | | |
|---|---|---|---|---|
| 07 - BLUE EARTH | BT | 1,258,615 | 459,394,475 | 717.920 |
| 07 - BLUE EARTH | CN | 430,946 | 157,295,290 | 53.363 |
| 07 - BLUE EARTH | DT | 663 | 241,995 | 14.215 |
| 07 - BLUE EARTH | GV | 81,830 | 29,867,950 | 879.844 |
| 07 - BLUE EARTH | UN | 36,802 | 13,432,730 | 51.432 |
| 07 - BLUE EARTH | -----SUBTOTAL-------> | 1,809,942 | 660,628,830 | 1,718.319 |
| | | | | |
| 08 - BROWN | BT | 571,174 | 208,478,510 | 449.865 |
| 08 - BROWN | CN | 12,565 | 4,586,225 | 2.781 |
| 08 - BROWN | DT | 199 | 72,635 | 2.126 |
| 08 - BROWN | GV | 174,946 | 63,855,290 | 857.729 |
| 08 - BROWN | UN | 156,387 | 57,081,255 | 381.851 |
| 08 - BROWN | -----SUBTOTAL-------> | 915,270 | 334,073,915 | 1,694.352 |
| | | | | |
| 09 - CARLTON | BB | 213 | 77,745 | 0.170 |
| 09 - CARLTON | BT | 921,714 | 336,425,610 | 516.926 |
| 09 - CARLTON | CN | 342,525 | 125,021,625 | 20.091 |
| 09 - CARLTON | DT | 3,097 | 1,130,405 | 28.137 |
| 09 - CARLTON | GV | 59,129 | 21,582,085 | 588.927 |
| 09 - CARLTON | UN | 19,208 | 7,010,920 | 49.809 |
| 09 - CARLTON | -----SUBTOTAL-------> | 1,345,885 | 491,248,390 | 1,204.060 |
| | | | | |
| 10 - CARVER | BB | 94 | 34,310 | 1.000 |
| 10 - CARVER | BT | 1,853,853 | 676,656,345 | 575.488 |
| 10 - CARVER | CN | 187,197 | 68,326,905 | 14.799 |
| 10 - CARVER | DT | 4 | 1,460 | 0.760 |
| 10 - CARVER | GV | 74,977 | 27,366,605 | 355.246 |
| 10 - CARVER | UN | 67,622 | 24,682,030 | 105.145 |
| 10 - CARVER | -----SUBTOTAL-------> | 2,183,747 | 797,067,655 | 1,052.438 |
| | | | | |
| 11 - CASS | BT | 1,118,560 | 408,274,400 | 735.106 |
| 11 - CASS | DT | 19,868 | 7,251,820 | 436.365 |
| 11 - CASS | GV | 75,806 | 27,669,190 | 1,547.407 |
| 11 - CASS | UN | 52,878 | 19,300,470 | 298.761 |
| 11 - CASS | -----SUBTOTAL-------> | 1,267,112 | 462,495,880 | 3,017.639 |
| | | | | |
| 12 - CHIPPEWA | BB | 28 | 10,220 | 0.070 |
| 12 - CHIPPEWA | BT | 265,170 | 96,787,050 | 324.208 |
| 12 - CHIPPEWA | CN | 123,273 | 44,994,645 | 35.766 |
| 12 - CHIPPEWA | DT | 511 | 186,515 | 16.264 |
| 12 - CHIPPEWA | GV | 47,038 | 17,168,870 | 807.644 |
| 12 - CHIPPEWA | UN | 9,874 | 3,604,010 | 21.918 |

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|---|---|---|---|---|
| 12 - CHIPPEWA | -----SUBTOTAL-------> | 445,895 | 162,751,310 | 1,205.870 |
| | | | | |
| 13 - CHISAGO | BB | 83 | 30,295 | 0.210 |
| 13 - CHISAGO | BT | 1,864,695 | 680,613,675 | 497.926 |
| 13 - CHISAGO | CN | 196,807 | 71,834,555 | 8.564 |
| 13 - CHISAGO | DT | 3,160 | 1,153,400 | 27.549 |
| 13 - CHISAGO | GV | 81,217 | 29,644,205 | 510.571 |
| 13 - CHISAGO | UN | 44,870 | 16,377,550 | 83.274 |
| 13 - CHISAGO | -----SUBTOTAL-------> | 2,190,831 | 799,653,680 | 1,128.094 |
| | | | | |
| 14 - CLAY | BT | 1,460,421 | 533,053,665 | 606.483 |
| 14 - CLAY | CN | 200,265 | 73,096,725 | 14.814 |
| 14 - CLAY | DT | 4,656 | 1,699,440 | 139.861 |
| 14 - CLAY | GV | 114,703 | 41,866,595 | 1,325.815 |
| 14 - CLAY | UN | 27,443 | 10,016,695 | 53.667 |
| 14 - CLAY | -----SUBTOTAL-------> | 1,807,489 | 659,733,120 | 2,140.640 |
| | | | | |
| 15 - CLEARWATER | BB | 92 | 33,580 | 0.220 |
| 15 - CLEARWATER | BT | 255,845 | 93,383,425 | 393.537 |
| 15 - CLEARWATER | CN | 1,547 | 564,655 | 1.488 |
| 15 - CLEARWATER | DT | 2,880 | 1,051,200 | 64.140 |
| 15 - CLEARWATER | GV | 34,117 | 12,452,705 | 618.860 |
| 15 - CLEARWATER | UN | 9,770 | 3,566,050 | 170.622 |
| 15 - CLEARWATER | -----SUBTOTAL-------> | 304,250 | 111,051,615 | 1,248.867 |
| | | | | |
| 16 - COOK | BT | 287,287 | 104,859,755 | 204.146 |
| 16 - COOK | DT | 799 | 291,635 | 14.267 |
| 16 - COOK | GV | 26,026 | 9,499,490 | 305.333 |
| 16 - COOK | UN | 5,181 | 1,891,065 | 174.963 |
| 16 - COOK | -----SUBTOTAL-------> | 319,292 | 116,541,945 | 698.709 |
| | | | | |
| 17 - COTTONWOOD | BB | 18 | 6,570 | 0.740 |
| 17 - COTTONWOOD | BT | 197,069 | 71,930,185 | 327.454 |
| 17 - COTTONWOOD | CN | 114,901 | 41,938,865 | 26.604 |
| 17 - COTTONWOOD | DT | 413 | 150,745 | 15.422 |
| 17 - COTTONWOOD | GV | 44,317 | 16,175,705 | 835.390 |
| 17 - COTTONWOOD | UN | 22,623 | 8,257,395 | 61.908 |
| 17 - COTTONWOOD | -----SUBTOTAL-------> | 379,340 | 138,459,465 | 1,267.518 |
| | | | | |
| 18 - CROW WING | BT | 2,179,960 | 795,685,400 | 1,021.309 |
| 18 - CROW WING | CN | 12,481 | 4,555,565 | 2.839 |
| 18 - CROW WING | DT | 7,272 | 2,654,280 | 90.741 |

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|---|---|---|---|---|
| 18 - CROW WING | GV | 94,813 | 34,606,745 | 716.962 |
| 18 - CROW WING | UN | 78,752 | 28,744,480 | 176.135 |
| 18 - CROW WING | -----SUBTOTAL-------> | 2,373,278 | 866,246,470 | 2,007.986 |
| | | | | |
| 19 - DAKOTA | BB | 1,737 | 634,005 | 2.007 |
| 19 - DAKOTA | BT | 7,957,499 | 2,904,487,135 | 1,829.564 |
| 19 - DAKOTA | CN | 2,395,661 | 874,416,265 | 51.152 |
| 19 - DAKOTA | DT | 196 | 71,540 | 3.526 |
| 19 - DAKOTA | GV | 176,569 | 64,447,685 | 519.311 |
| 19 - DAKOTA | UN | 96,665 | 35,282,725 | 136.375 |
| 19 - DAKOTA | -----SUBTOTAL-------> | 10,628,327 | 3,879,339,355 | 2,541.935 |
| | | | | |
| 20 - DODGE | BT | 358,401 | 130,816,365 | 334.823 |
| 20 - DODGE | CN | 185,208 | 67,600,920 | 16.218 |
| 20 - DODGE | DT | 161 | 58,765 | 8.698 |
| 20 - DODGE | GV | 45,892 | 16,750,580 | 529.603 |
| 20 - DODGE | UN | 12,647 | 4,616,155 | 30.618 |
| 20 - DODGE | -----SUBTOTAL-------> | 602,309 | 219,842,785 | 919.960 |
| | | | | |
| 21 - DOUGLAS | BT | 1,047,515 | 382,342,975 | 585.929 |
| 21 - DOUGLAS | CN | 336,783 | 122,925,795 | 27.466 |
| 21 - DOUGLAS | DT | 611 | 223,015 | 26.255 |
| 21 - DOUGLAS | GV | 76,136 | 27,789,640 | 858.314 |
| 21 - DOUGLAS | UN | 15,045 | 5,491,425 | 29.967 |
| 21 - DOUGLAS | -----SUBTOTAL-------> | 1,476,090 | 538,772,850 | 1,527.931 |
| | | | | |
| 22 - FARIBAULT | BB | 1,112 | 405,880 | 0.288 |
| 22 - FARIBAULT | BT | 461,633 | 168,496,045 | 387.025 |
| 22 - FARIBAULT | CN | 88,340 | 32,244,100 | 25.724 |
| 22 - FARIBAULT | DT | 778 | 283,970 | 19.637 |
| 22 - FARIBAULT | GV | 59,313 | 21,649,245 | 943.807 |
| 22 - FARIBAULT | UN | 30,682 | 11,198,930 | 74.288 |
| 22 - FARIBAULT | -----SUBTOTAL-------> | 641,858 | 234,278,170 | 1,450.769 |
| | | | | |
| 23 - FILLMORE | BT | 391,507 | 142,900,055 | 479.129 |
| 23 - FILLMORE | CN | 73,667 | 26,888,455 | 39.963 |
| 23 - FILLMORE | DT | 626 | 228,490 | 22.879 |
| 23 - FILLMORE | GV | 73,248 | 26,735,520 | 1,027.823 |
| 23 - FILLMORE | UN | 22,141 | 8,081,465 | 53.288 |
| 23 - FILLMORE | -----SUBTOTAL-------> | 561,190 | 204,833,985 | 1,623.082 |
| | | | | |
| 24 - FREEBORN | BB | 154 | 56,210 | 1.530 |

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|---|---|---|---|---|
| 24 - FREEBORN | BT | 634,772 | 231,691,780 | 560.386 |
| 24 - FREEBORN | CN | 886,868 | 323,706,820 | 79.266 |
| 24 - FREEBORN | DT | 538 | 196,370 | 6.339 |
| 24 - FREEBORN | GV | 89,709 | 32,743,785 | 881.882 |
| 24 - FREEBORN | UN | 9,328 | 3,404,720 | 20.888 |
| 24 - FREEBORN | -----SUBTOTAL-------> | 1,621,369 | 591,799,685 | 1,550.291 |
| | | | | |
| 25 - GOODHUE | BB | 60 | 21,900 | 0.200 |
| 25 - GOODHUE | BT | 1,235,988 | 451,135,620 | 575.085 |
| 25 - GOODHUE | CN | 392,977 | 143,436,605 | 35.292 |
| 25 - GOODHUE | DT | 4,330 | 1,580,450 | 27.745 |
| 25 - GOODHUE | GV | 100,331 | 36,620,815 | 902.172 |
| 25 - GOODHUE | UN | 38,214 | 13,948,110 | 85.358 |
| 25 - GOODHUE | -----SUBTOTAL-------> | 1,771,899 | 646,743,500 | 1,625.852 |
| | | | | |
| 26 - GRANT | BT | 154,955 | 56,558,575 | 274.474 |
| 26 - GRANT | CN | 142,937 | 52,172,005 | 19.806 |
| 26 - GRANT | DT | 1,287 | 469,755 | 51.581 |
| 26 - GRANT | GV | 26,196 | 9,561,540 | 706.618 |
| 26 - GRANT | UN | 12,798 | 4,671,270 | 30.693 |
| 26 - GRANT | -----SUBTOTAL-------> | 338,173 | 123,433,145 | 1,083.172 |
| | | | | |
| 27 - HENNEPIN | BB | 15,118 | 5,518,070 | 7.923 |
| 27 - HENNEPIN | BT | 21,226,855 | 7,747,802,075 | 4,358.991 |
| 27 - HENNEPIN | CN | 8,686,286 | 3,170,494,390 | 270.395 |
| 27 - HENNEPIN | DT | 7,219 | 2,634,935 | 4.427 |
| 27 - HENNEPIN | GV | 346,449 | 126,453,885 | 373.644 |
| 27 - HENNEPIN | UN | 398,103 | 145,307,595 | 264.983 |
| 27 - HENNEPIN | -----SUBTOTAL-------> | 30,680,029 | 11,198,210,950 | 5,280.363 |
| | | | | |
| 28 - HOUSTON | BT | 370,072 | 135,076,280 | 322.743 |
| 28 - HOUSTON | CN | 44,552 | 16,261,480 | 3.705 |
| 28 - HOUSTON | DT | 165 | 60,225 | 2.471 |
| 28 - HOUSTON | GV | 42,346 | 15,456,290 | 520.972 |
| 28 - HOUSTON | UN | 27,220 | 9,935,300 | 60.967 |
| 28 - HOUSTON | -----SUBTOTAL-------> | 484,355 | 176,789,575 | 910.858 |
| | | | | |
| 29 - HUBBARD | BT | 667,158 | 243,512,670 | 489.991 |
| 29 - HUBBARD | CN | 88 | 32,120 | 0.210 |
| 29 - HUBBARD | DT | 6,531 | 2,383,815 | 161.931 |
| 29 - HUBBARD | GV | 53,964 | 19,696,860 | 801.137 |
| 29 - HUBBARD | UN | 2,203 | 804,095 | 13.881 |

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|---|---|---|---|---|
| 29 - HUBBARD | -----SUBTOTAL-------> | 729,943 | 266,429,560 | 1,467.150 |
| 30 - ISANTI | BT | 905,361 | 330,456,765 | 472.345 |
| 30 - ISANTI | CN | 115,674 | 42,221,010 | 6.147 |
| 30 - ISANTI | DT | 3,089 | 1,127,485 | 75.134 |
| 30 - ISANTI | GV | 58,153 | 21,225,845 | 490.020 |
| 30 - ISANTI | UN | 12,419 | 4,532,935 | 27.923 |
| 30 - ISANTI | -----SUBTOTAL-------> | 1,094,696 | 399,564,040 | 1,071.569 |
| 31 - ITASCA | BB | 137 | 50,005 | 0.885 |
| 31 - ITASCA | BT | 1,193,515 | 435,632,975 | 997.307 |
| 31 - ITASCA | CN | 72,700 | 26,535,500 | 11.440 |
| 31 - ITASCA | DT | 16,187 | 5,908,255 | 257.226 |
| 31 - ITASCA | GV | 109,198 | 39,857,270 | 1,764.020 |
| 31 - ITASCA | UN | 28,740 | 10,490,100 | 233.266 |
| 31 - ITASCA | -----SUBTOTAL-------> | 1,420,476 | 518,474,105 | 3,264.144 |
| 32 - JACKSON | BB | 38 | 13,870 | 0.430 |
| 32 - JACKSON | BT | 563,561 | 205,699,765 | 458.069 |
| 32 - JACKSON | CN | 48,246 | 17,609,790 | 12.864 |
| 32 - JACKSON | DT | 1,201 | 438,365 | 23.998 |
| 32 - JACKSON | GV | 60,670 | 22,144,550 | 859.877 |
| 32 - JACKSON | UN | 18,078 | 6,598,470 | 56.272 |
| 32 - JACKSON | -----SUBTOTAL-------> | 691,794 | 252,504,810 | 1,411.510 |
| 33 - KANABEC | BB | 6,775 | 2,472,875 | 5.766 |
| 33 - KANABEC | BT | 407,278 | 148,656,470 | 310.180 |
| 33 - KANABEC | CN | 38,028 | 13,880,220 | 7.019 |
| 33 - KANABEC | DT | 783 | 285,795 | 17.240 |
| 33 - KANABEC | GV | 41,432 | 15,122,680 | 469.615 |
| 33 - KANABEC | UN | 8,998 | 3,284,270 | 24.651 |
| 33 - KANABEC | -----SUBTOTAL-------> | 503,294 | 183,702,310 | 834.471 |
| 34 - KANDIYOHI | BB | 25 | 9,125 | 0.342 |
| 34 - KANDIYOHI | BT | 1,158,256 | 422,763,440 | 710.974 |
| 34 - KANDIYOHI | CN | 65,338 | 23,848,370 | 17.761 |
| 34 - KANDIYOHI | DT | 426 | 155,490 | 7.510 |
| 34 - KANDIYOHI | GV | 86,610 | 31,612,650 | 888.456 |
| 34 - KANDIYOHI | UN | 22,205 | 8,104,825 | 62.023 |
| 34 - KANDIYOHI | -----SUBTOTAL-------> | 1,332,860 | 486,493,900 | 1,687.066 |
| 35 - KITTSON | BT | 155,506 | 56,759,690 | 363.346 |

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|---|---|---|---|---|---|
| 35 - KITTSON | CN | 5,205 | 1,899,825 | 10.986 |
| 35 - KITTSON | DT | 14,065 | 5,133,725 | 455.437 |
| 35 - KITTSON | GV | 35,376 | 12,912,240 | 834.762 |
| 35 - KITTSON | UN | 1,144 | 417,560 | 7.800 |
| 35 - KITTSON | -----SUBTOTAL-------> | 211,297 | 77,123,040 | 1,672.331 |
| | | | | |
| 36 - KOOCHICHING | BB | 899 | 328,135 | 1.729 |
| 36 - KOOCHICHING | BT | 372,488 | 135,958,120 | 573.873 |
| 36 - KOOCHICHING | CN | 1,737 | 634,005 | 2.270 |
| 36 - KOOCHICHING | DT | 2,131 | 777,815 | 80.406 |
| 36 - KOOCHICHING | GV | 25,490 | 9,303,850 | 455.212 |
| 36 - KOOCHICHING | UN | 11,340 | 4,139,100 | 268.632 |
| 36 - KOOCHICHING | -----SUBTOTAL-------> | 414,085 | 151,141,025 | 1,382.122 |
| | | | | |
| 37 - LAC QUI PARLE | BT | 217,449 | 79,368,885 | 338.865 |
| 37 - LAC QUI PARLE | CN | 3,316 | 1,210,340 | 2.558 |
| 37 - LAC QUI PARLE | DT | 1,718 | 627,070 | 37.619 |
| 37 - LAC QUI PARLE | GV | 49,839 | 18,191,235 | 1,068.998 |
| 37 - LAC QUI PARLE | UN | 17,396 | 6,349,540 | 43.512 |
| 37 - LAC QUI PARLE | -----SUBTOTAL-------> | 289,718 | 105,747,070 | 1,491.552 |
| | | | | |
| 38 - LAKE | BT | 333,419 | 121,697,935 | 291.871 |
| 38 - LAKE | CN | 80,528 | 29,392,720 | 13.130 |
| 38 - LAKE | DT | 2,349 | 857,385 | 54.557 |
| 38 - LAKE | GV | 46,353 | 16,918,845 | 633.549 |
| 38 - LAKE | UN | 13,507 | 4,930,055 | 27.758 |
| 38 - LAKE | -----SUBTOTAL-------> | 476,155 | 173,796,940 | 1,020.865 |
| | | | | |
| 39 - LAKE OF THE WOODS | BT | 104,777 | 38,243,605 | 205.064 |
| 39 - LAKE OF THE WOODS | DT | 1,844 | 673,060 | 54.053 |
| 39 - LAKE OF THE WOODS | GV | 15,585 | 5,688,525 | 408.751 |
| 39 - LAKE OF THE WOODS | UN | 5,007 | 1,827,555 | 27.029 |
| 39 - LAKE OF THE WOODS | -----SUBTOTAL-------> | 127,212 | 46,432,745 | 694.897 |
| | | | | |
| 40 - LE SUEUR | BT | 591,892 | 216,040,580 | 451.641 |
| 40 - LE SUEUR | CN | 79,014 | 28,840,110 | 16.158 |
| 40 - LE SUEUR | DT | 667 | 243,455 | 7.699 |
| 40 - LE SUEUR | GV | 81,195 | 29,636,175 | 552.917 |
| 40 - LE SUEUR | UN | 1,852 | 675,980 | 9.297 |
| 40 - LE SUEUR | -----SUBTOTAL-------> | 754,620 | 275,436,300 | 1,037.712 |
| | | | | |
| 41 - LINCOLN | BT | 153,331 | 55,965,815 | 310.130 |

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|---|---|---|---|---|
| 41 - LINCOLN | DT | 1,148 | 419,020 | 34.892 |
| 41 - LINCOLN | GV | 35,394 | 12,918,810 | 698.898 |
| 41 - LINCOLN | UN | 9,921 | 3,621,165 | 23.827 |
| 41 - LINCOLN | -----SUBTOTAL-------> | 199,794 | 72,924,810 | 1,067.747 |
| | | | | |
| 42 - LYON | BT | 669,002 | 244,185,730 | 541.942 |
| 42 - LYON | CN | 16,040 | 5,854,600 | 3.844 |
| 42 - LYON | DT | 408 | 148,920 | 13.222 |
| 42 - LYON | GV | 48,148 | 17,574,020 | 833.112 |
| 42 - LYON | UN | 22,824 | 8,330,760 | 75.069 |
| 42 - LYON | -----SUBTOTAL-------> | 756,421 | 276,094,030 | 1,467.189 |
| | | | | |
| 43 - MCLEOD | BB | 228 | 83,220 | 0.303 |
| 43 - MCLEOD | BT | 623,340 | 227,519,100 | 444.065 |
| 43 - MCLEOD | CN | 284,586 | 103,873,890 | 50.635 |
| 43 - MCLEOD | DT | 162 | 59,130 | 2.617 |
| 43 - MCLEOD | GV | 66,850 | 24,400,250 | 606.688 |
| 43 - MCLEOD | UN | 8,564 | 3,125,860 | 12.878 |
| 43 - MCLEOD | -----SUBTOTAL-------> | 983,729 | 359,061,450 | 1,117.186 |
| | | | | |
| 44 - MAHNOMEN | BT | 176,778 | 64,523,970 | 212.327 |
| 44 - MAHNOMEN | DT | 1,051 | 383,615 | 54.301 |
| 44 - MAHNOMEN | GV | 18,649 | 6,806,885 | 439.448 |
| 44 - MAHNOMEN | UN | 6,389 | 2,331,985 | 49.125 |
| 44 - MAHNOMEN | -----SUBTOTAL-------> | 202,867 | 74,046,455 | 755.201 |
| | | | | |
| 45 - MARSHALL | BB | 169 | 61,685 | 2.122 |
| 45 - MARSHALL | BT | 265,550 | 96,925,750 | 564.560 |
| 45 - MARSHALL | CN | 2,101 | 766,865 | 5.373 |
| 45 - MARSHALL | DT | 47,398 | 17,300,270 | 786.135 |
| 45 - MARSHALL | GV | 81,948 | 29,911,020 | 1,451.120 |
| 45 - MARSHALL | UN | 15,068 | 5,499,820 | 50.150 |
| 45 - MARSHALL | -----SUBTOTAL-------> | 412,234 | 150,465,410 | 2,859.460 |
| | | | | |
| 46 - MARTIN | BB | 50 | 18,250 | 0.120 |
| 46 - MARTIN | BT | 617,012 | 225,209,380 | 408.772 |
| 46 - MARTIN | CN | 85,075 | 31,052,375 | 30.801 |
| 46 - MARTIN | DT | 280 | 102,200 | 5.261 |
| 46 - MARTIN | GV | 87,395 | 31,899,175 | 1,029.307 |
| 46 - MARTIN | UN | 11,722 | 4,278,530 | 30.552 |
| 46 - MARTIN | -----SUBTOTAL-------> | 801,534 | 292,559,910 | 1,504.813 |

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|---|---|---|---|---|
| 47 - MEEKER | BB | 436 | 159,140 | 0.350 |
| 47 - MEEKER | BT | 490,424 | 179,004,760 | 466.953 |
| 47 - MEEKER | CN | 130,726 | 47,714,990 | 34.904 |
| 47 - MEEKER | DT | 513 | 187,245 | 14.456 |
| 47 - MEEKER | GV | 68,083 | 24,850,295 | 747.098 |
| 47 - MEEKER | UN | 15,701 | 5,730,865 | 31.363 |
| 47 - MEEKER | -----SUBTOTAL-------> | 705,883 | 257,647,295 | 1,295.124 |
| | | | | |
| 48 - MILLE LACS | BT | 1,179,183 | 430,401,795 | 397.691 |
| 48 - MILLE LACS | DT | 400 | 146,000 | 15.713 |
| 48 - MILLE LACS | GV | 46,666 | 17,033,090 | 540.252 |
| 48 - MILLE LACS | UN | 19,465 | 7,104,725 | 66.389 |
| 48 - MILLE LACS | -----SUBTOTAL-------> | 1,245,714 | 454,685,610 | 1,020.045 |
| | | | | |
| 49 - MORRISON | BT | 1,230,319 | 449,066,435 | 886.176 |
| 49 - MORRISON | CN | 12,308 | 4,492,420 | 1.878 |
| 49 - MORRISON | DT | 4,405 | 1,607,825 | 76.354 |
| 49 - MORRISON | GV | 80,137 | 29,250,005 | 889.647 |
| 49 - MORRISON | UN | 21,227 | 7,747,855 | 62.940 |
| 49 - MORRISON | -----SUBTOTAL-------> | 1,348,397 | 492,164,540 | 1,916.995 |
| | | | | |
| 50 - MOWER | BB | 237 | 86,505 | 0.315 |
| 50 - MOWER | BT | 610,384 | 222,790,160 | 556.183 |
| 50 - MOWER | CN | 420,947 | 153,645,655 | 66.015 |
| 50 - MOWER | DT | 872 | 318,280 | 10.728 |
| 50 - MOWER | GV | 73,422 | 26,799,030 | 908.076 |
| 50 - MOWER | UN | 16,757 | 6,116,305 | 23.239 |
| 50 - MOWER | -----SUBTOTAL-------> | 1,122,617 | 409,755,935 | 1,564.556 |
| | | | | |
| 51 - MURRAY | BT | 207,105 | 75,593,325 | 350.784 |
| 51 - MURRAY | CN | 8,293 | 3,026,945 | 6.871 |
| 51 - MURRAY | DT | 586 | 213,890 | 26.815 |
| 51 - MURRAY | GV | 51,987 | 18,975,255 | 928.553 |
| 51 - MURRAY | UN | 17,144 | 6,257,560 | 70.898 |
| 51 - MURRAY | -----SUBTOTAL-------> | 285,115 | 104,066,975 | 1,383.921 |
| | | | | |
| 52 - NICOLLET | BB | 2,918 | 1,065,070 | 0.512 |
| 52 - NICOLLET | BT | 904,153 | 330,015,845 | 403.194 |
| 52 - NICOLLET | CN | 76,435 | 27,898,775 | 12.627 |
| 52 - NICOLLET | DT | 438 | 159,870 | 4.465 |
| 52 - NICOLLET | GV | 35,471 | 12,946,915 | 441.886 |
| 52 - NICOLLET | UN | 23,112 | 8,435,880 | 36.288 |

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|---|---|---|---|---|
| 52 - NICOLLET | -----SUBTOTAL-------> | 1,042,528 | 380,522,355 | 898.972 |
| 53 - NOBLES | BB | 24 | 8,760 | 0.030 |
| 53 - NOBLES | BT | 567,350 | 207,082,750 | 490.361 |
| 53 - NOBLES | CN | 152,958 | 55,829,670 | 44.784 |
| 53 - NOBLES | DT | 1,196 | 436,540 | 37.522 |
| 53 - NOBLES | GV | 75,196 | 27,446,540 | 900.895 |
| 53 - NOBLES | UN | 15,420 | 5,628,300 | 40.804 |
| 53 - NOBLES | -----SUBTOTAL-------> | 812,143 | 296,432,560 | 1,514.396 |
| 54 - NORMAN | BT | 203,278 | 74,196,470 | 377.094 |
| 54 - NORMAN | CN | 17,288 | 6,310,120 | 15.712 |
| 54 - NORMAN | DT | 6,608 | 2,411,920 | 204.488 |
| 54 - NORMAN | GV | 37,155 | 13,561,575 | 956.567 |
| 54 - NORMAN | UN | 10,347 | 3,776,655 | 42.153 |
| 54 - NORMAN | -----SUBTOTAL-------> | 274,676 | 100,256,740 | 1,596.014 |
| 55 - OLMSTED | BB | 33 | 12,045 | 0.040 |
| 55 - OLMSTED | BT | 1,964,874 | 717,179,010 | 796.395 |
| 55 - OLMSTED | CN | 1,542,238 | 562,916,870 | 126.539 |
| 55 - OLMSTED | DT | 404 | 147,460 | 8.570 |
| 55 - OLMSTED | GV | 104,527 | 38,152,355 | 744.486 |
| 55 - OLMSTED | UN | 82,857 | 30,242,805 | 125.413 |
| 55 - OLMSTED | -----SUBTOTAL-------> | 3,694,934 | 1,348,650,545 | 1,801.443 |
| 56 - OTTER TAIL | BB | 321 | 117,165 | 1.815 |
| 56 - OTTER TAIL | BT | 1,557,600 | 568,524,000 | 1,494.378 |
| 56 - OTTER TAIL | CN | 475,580 | 173,586,700 | 33.664 |
| 56 - OTTER TAIL | DT | 5,029 | 1,835,585 | 138.727 |
| 56 - OTTER TAIL | GV | 148,182 | 54,086,430 | 2,211.825 |
| 56 - OTTER TAIL | UN | 24,060 | 8,781,900 | 63.783 |
| 56 - OTTER TAIL | -----SUBTOTAL-------> | 2,210,772 | 806,931,780 | 3,944.192 |
| 57 - PENNINGTON | BT | 320,657 | 117,039,805 | 291.633 |
| 57 - PENNINGTON | CN | 9,231 | 3,369,315 | 2.469 |
| 57 - PENNINGTON | DT | 3,490 | 1,273,850 | 130.582 |
| 57 - PENNINGTON | GV | 43,330 | 15,815,450 | 716.196 |
| 57 - PENNINGTON | UN | 3,273 | 1,194,645 | 4.433 |
| 57 - PENNINGTON | -----SUBTOTAL-------> | 379,981 | 138,693,065 | 1,145.313 |
| 58 - PINE | BT | 1,152,483 | 420,656,295 | 562.084 |
| 58 - PINE | CN | 318,036 | 116,083,140 | 20.195 |

| | | | | |
|---|---|---|---|---|
| 58 - PINE | DT | 4,803 | 1,753,095 | 96.881 |
| 58 - PINE | GV | 74,374 | 27,146,510 | 1,072.341 |
| 58 - PINE | UN | 42,917 | 15,664,705 | 163.181 |
| 58 - PINE | -----SUBTOTAL-------> | 1,592,613 | 581,303,745 | 1,914.682 |
| 59 - PIPESTONE | BT | 267,838 | 97,760,870 | 317.645 |
| 59 - PIPESTONE | CN | 1,199 | 437,635 | 2.664 |
| 59 - PIPESTONE | DT | 617 | 225,205 | 12.385 |
| 59 - PIPESTONE | GV | 34,477 | 12,584,105 | 622.985 |
| 59 - PIPESTONE | UN | 3,355 | 1,224,575 | 10.319 |
| 59 - PIPESTONE | -----SUBTOTAL-------> | 307,485 | 112,232,390 | 965.998 |
| 60 - POLK | BB | 563 | 205,495 | 8.806 |
| 60 - POLK | BT | 734,070 | 267,935,550 | 935.617 |
| 60 - POLK | CN | 138,322 | 50,487,530 | 41.831 |
| 60 - POLK | DT | 18,050 | 6,588,250 | 713.529 |
| 60 - POLK | GV | 93,895 | 34,271,675 | 1,925.407 |
| 60 - POLK | UN | 28,793 | 10,509,445 | 84.676 |
| 60 - POLK | -----SUBTOTAL-------> | 1,013,693 | 369,997,945 | 3,709.866 |
| 61 - POPE | BT | 292,228 | 106,663,220 | 362.048 |
| 61 - POPE | DT | 1,483 | 541,295 | 29.306 |
| 61 - POPE | GV | 47,158 | 17,212,670 | 807.524 |
| 61 - POPE | UN | 15,164 | 5,534,860 | 38.518 |
| 61 - POPE | -----SUBTOTAL-------> | 356,033 | 129,952,045 | 1,237.396 |
| 62 - RAMSEY | BB | 2,889 | 1,054,485 | 1.880 |
| 62 - RAMSEY | BT | 8,934,015 | 3,260,915,475 | 1,740.364 |
| 62 - RAMSEY | CN | 3,804,178 | 1,388,524,970 | 92.380 |
| 62 - RAMSEY | DT | 559 | 204,035 | 0.818 |
| 62 - RAMSEY | GV | 17,288 | 6,310,120 | 27.380 |
| 62 - RAMSEY | UN | 92,030 | 33,590,950 | 108.737 |
| 62 - RAMSEY | -----SUBTOTAL-------> | 12,850,958 | 4,690,600,035 | 1,971.559 |
| 63 - RED LAKE | BT | 115,481 | 42,150,565 | 188.731 |
| 63 - RED LAKE | CN | 4,342 | 1,584,830 | 1.500 |
| 63 - RED LAKE | DT | 2,810 | 1,025,650 | 82.211 |
| 63 - RED LAKE | GV | 19,292 | 7,041,580 | 503.468 |
| 63 - RED LAKE | UN | 5,953 | 2,172,845 | 15.346 |
| 63 - RED LAKE | -----SUBTOTAL-------> | 147,877 | 53,975,470 | 791.256 |
| 64 - REDWOOD | BB | 79 | 28,835 | 0.190 |

| | | | | |
|---|---|---|---|---|
| 64 - REDWOOD | BT | 435,911 | 159,107,515 | 494.331 |
| 64 - REDWOOD | CN | 52,516 | 19,168,340 | 18.527 |
| 64 - REDWOOD | DT | 796 | 290,540 | 19.095 |
| 64 - REDWOOD | GV | 70,873 | 25,868,645 | 1,128.241 |
| 64 - REDWOOD | UN | 24,927 | 9,098,355 | 54.749 |
| 64 - REDWOOD | -----SUBTOTAL-------> | 585,102 | 213,562,230 | 1,715.133 |
| | | | | |
| 65 - RENVILLE | BT | 467,334 | 170,576,910 | 542.591 |
| 65 - RENVILLE | CN | 80,376 | 29,337,240 | 23.626 |
| 65 - RENVILLE | DT | 298 | 108,770 | 6.325 |
| 65 - RENVILLE | GV | 85,262 | 31,120,630 | 1,255.083 |
| 65 - RENVILLE | UN | 27,572 | 10,063,780 | 69.613 |
| 65 - RENVILLE | -----SUBTOTAL-------> | 660,841 | 241,207,330 | 1,897.238 |
| | | | | |
| 66 - RICE | BB | 118 | 43,070 | 0.080 |
| 66 - RICE | BT | 1,141,948 | 416,811,020 | 587.072 |
| 66 - RICE | CN | 689,564 | 251,690,860 | 31.933 |
| 66 - RICE | DT | 563 | 205,495 | 11.011 |
| 66 - RICE | GV | 80,367 | 29,333,955 | 608.074 |
| 66 - RICE | UN | 21,942 | 8,008,830 | 31.424 |
| 66 - RICE | -----SUBTOTAL-------> | 1,934,500 | 706,093,230 | 1,269.594 |
| | | | | |
| 67 - ROCK | BB | 359 | 131,035 | 0.860 |
| 67 - ROCK | BT | 340,341 | 124,224,465 | 304.644 |
| 67 - ROCK | CN | 43,789 | 15,982,985 | 13.730 |
| 67 - ROCK | DT | 428 | 156,220 | 16.926 |
| 67 - ROCK | GV | 43,618 | 15,920,570 | 658.647 |
| 67 - ROCK | UN | 7,655 | 2,794,075 | 18.573 |
| 67 - ROCK | -----SUBTOTAL-------> | 436,188 | 159,209,350 | 1,013.380 |
| | | | | |
| 68 - ROSEAU | BB | 164 | 59,860 | 2.649 |
| 68 - ROSEAU | BT | 378,499 | 138,152,135 | 506.167 |
| 68 - ROSEAU | DT | 16,490 | 6,018,850 | 377.931 |
| 68 - ROSEAU | GV | 60,363 | 22,032,495 | 1,399.343 |
| 68 - ROSEAU | UN | 1,744 | 636,560 | 33.167 |
| 68 - ROSEAU | -----SUBTOTAL-------> | 457,260 | 166,899,900 | 2,319.257 |
| | | | | |
| 69 - ST LOUIS | BB | 2,402 | 876,730 | 2.759 |
| 69 - ST LOUIS | BT | 4,222,791 | 1,541,318,715 | 2,279.678 |
| 69 - ST LOUIS | CN | 1,240,326 | 452,718,990 | 170.877 |
| 69 - ST LOUIS | DT | 6,692 | 2,442,580 | 149.833 |
| 69 - ST LOUIS | GV | 444,791 | 162,348,715 | 2,862.801 |

| | | | | |
|---|---|---|---|---|
| 69 - ST LOUIS | UN | 65,306 | 23,836,690 | 194.202 |
| 69 - ST LOUIS | -----SUBTOTAL-------> | 5,982,308 | 2,183,542,420 | 5,660.150 |
| | | | | |
| 70 - SCOTT | BT | 2,490,377 | 908,987,605 | 688.045 |
| 70 - SCOTT | CN | 732,564 | 267,385,860 | 22.276 |
| 70 - SCOTT | DT | 1,211 | 442,015 | 2.718 |
| 70 - SCOTT | GV | 165,675 | 60,471,375 | 409.648 |
| 70 - SCOTT | UN | 57,346 | 20,931,290 | 103.978 |
| 70 - SCOTT | -----SUBTOTAL-------> | 3,447,173 | 1,258,218,145 | 1,226.665 |
| | | | | |
| 71 - SHERBURNE | BT | 2,163,286 | 789,599,390 | 700.587 |
| 71 - SHERBURNE | CN | 255,024 | 93,083,760 | 11.023 |
| 71 - SHERBURNE | DT | 2,140 | 781,100 | 23.280 |
| 71 - SHERBURNE | GV | 118,630 | 43,299,950 | 478.992 |
| 71 - SHERBURNE | UN | 38,784 | 14,156,160 | 73.412 |
| 71 - SHERBURNE | -----SUBTOTAL-------> | 2,577,863 | 940,920,360 | 1,287.294 |
| | | | | |
| 72 - SIBLEY | BT | 416,210 | 151,916,650 | 419.655 |
| 72 - SIBLEY | CN | 51,815 | 18,912,475 | 14.807 |
| 72 - SIBLEY | DT | 101 | 36,865 | 3.019 |
| 72 - SIBLEY | GV | 49,743 | 18,156,195 | 690.664 |
| 72 - SIBLEY | UN | 1,510 | 551,150 | 7.286 |
| 72 - SIBLEY | -----SUBTOTAL-------> | 519,379 | 189,573,335 | 1,135.431 |
| | | | | |
| 73 - STEARNS | BB | 1,331 | 485,815 | 4.247 |
| 73 - STEARNS | BT | 4,481,809 | 1,635,860,285 | 1,600.879 |
| 73 - STEARNS | CN | 317,847 | 116,014,155 | 22.270 |
| 73 - STEARNS | DT | 3,646 | 1,330,790 | 51.686 |
| 73 - STEARNS | GV | 132,053 | 48,199,345 | 1,332.317 |
| 73 - STEARNS | UN | 92,573 | 33,789,145 | 171.032 |
| 73 - STEARNS | -----SUBTOTAL-------> | 5,029,259 | 1,835,679,535 | 3,182.431 |
| | | | | |
| 74 - STEELE | BB | 29 | 10,585 | 0.034 |
| 74 - STEELE | BT | 1,007,073 | 367,581,645 | 462.151 |
| 74 - STEELE | CN | 320,163 | 116,859,495 | 34.229 |
| 74 - STEELE | DT | 581 | 212,065 | 2.733 |
| 74 - STEELE | GV | 62,457 | 22,796,805 | 448.040 |
| 74 - STEELE | UN | 459 | 167,535 | 3.373 |
| 74 - STEELE | -----SUBTOTAL-------> | 1,390,762 | 507,628,130 | 950.560 |
| | | | | |
| 75 - STEVENS | BT | 227,436 | 83,014,140 | 282.403 |
| 75 - STEVENS | CN | 575 | 209,875 | 3.970 |

| | | | | |
|---|---|---|---|---|
| 75 - STEVENS | DT | 3,293 | 1,201,945 | 89.137 |
| 75 - STEVENS | GV | 33,796 | 12,335,540 | 701.484 |
| 75 - STEVENS | UN | 2 | 730 | 0.400 |
| 75 - STEVENS | -----SUBTOTAL-------> | 265,101 | 96,762,230 | 1,077.394 |
| | | | | |
| 76 - SWIFT | BT | 279,341 | 101,959,465 | 385.074 |
| 76 - SWIFT | CN | 13,754 | 5,020,210 | 4.879 |
| 76 - SWIFT | DT | 3,031 | 1,106,315 | 52.810 |
| 76 - SWIFT | GV | 60,169 | 21,961,685 | 982.527 |
| 76 - SWIFT | UN | 996 | 363,540 | 8.700 |
| 76 - SWIFT | -----SUBTOTAL-------> | 357,291 | 130,411,215 | 1,433.990 |
| | | | | |
| 77 - TODD | BB | 129 | 47,085 | 1.545 |
| 77 - TODD | BT | 565,576 | 206,435,240 | 651.352 |
| 77 - TODD | CN | 166,369 | 60,724,685 | 11.154 |
| 77 - TODD | DT | 4,515 | 1,647,975 | 115.346 |
| 77 - TODD | GV | 69,918 | 25,520,070 | 1,030.643 |
| 77 - TODD | UN | 26,397 | 9,634,905 | 69.733 |
| 77 - TODD | -----SUBTOTAL-------> | 832,903 | 304,009,960 | 1,879.773 |
| | | | | |
| 78 - TRAVERSE | BT | 91,272 | 33,314,280 | 226.056 |
| 78 - TRAVERSE | CN | 628 | 229,220 | 0.229 |
| 78 - TRAVERSE | DT | 4,141 | 1,511,465 | 203.343 |
| 78 - TRAVERSE | GV | 24,691 | 9,012,215 | 688.956 |
| 78 - TRAVERSE | -----SUBTOTAL-------> | 120,733 | 44,067,180 | 1,118.584 |
| | | | | |
| 79 - WABASHA | BB | 33 | 12,045 | 0.420 |
| 79 - WABASHA | BT | 487,024 | 177,763,760 | 361.747 |
| 79 - WABASHA | CN | 9,299 | 3,394,135 | 5.315 |
| 79 - WABASHA | DT | 536 | 195,640 | 13.643 |
| 79 - WABASHA | GV | 51,129 | 18,662,085 | 535.929 |
| 79 - WABASHA | UN | 29,274 | 10,685,010 | 73.195 |
| 79 - WABASHA | -----SUBTOTAL-------> | 577,295 | 210,712,675 | 990.249 |
| | | | | |
| 80 - WADENA | BT | 376,585 | 137,453,525 | 344.671 |
| 80 - WADENA | CN | 9,668 | 3,528,820 | 1.663 |
| 80 - WADENA | DT | 13,423 | 4,899,395 | 215.887 |
| 80 - WADENA | GV | 30,999 | 11,314,635 | 386.184 |
| 80 - WADENA | UN | 1,917 | 699,705 | 9.642 |
| 80 - WADENA | -----SUBTOTAL-------> | 432,592 | 157,896,080 | 958.047 |
| | | | | |
| 81 - WASECA | BB | 98 | 35,770 | 0.130 |

| | | | | |
|---|---|---|---|---|
| 81 - WASECA | BT | 359,721 | 131,298,165 | 280.560 |
| 81 - WASECA | CN | 137,283 | 50,108,295 | 60.882 |
| 81 - WASECA | DT | 255 | 93,075 | 4.615 |
| 81 - WASECA | GV | 43,794 | 15,984,810 | 501.796 |
| 81 - WASECA | UN | 12,226 | 4,462,490 | 24.661 |
| 81 - WASECA | -----SUBTOTAL-------> | 553,377 | 201,982,605 | 872.644 |
| | | | | |
| 82 - WASHINGTON | BB | 2,579 | 941,335 | 3.904 |
| 82 - WASHINGTON | BT | 4,267,142 | 1,557,506,830 | 1,350.125 |
| 82 - WASHINGTON | CN | 1,630,673 | 595,195,645 | 27.969 |
| 82 - WASHINGTON | DT | 347 | 126,655 | 1.206 |
| 82 - WASHINGTON | GV | 117,989 | 43,065,985 | 372.241 |
| 82 - WASHINGTON | UN | 54,608 | 19,931,920 | 107.352 |
| 82 - WASHINGTON | -----SUBTOTAL-------> | 6,073,338 | 2,216,768,370 | 1,862.797 |
| | | | | |
| 83 - WATONWAN | BT | 244,342 | 89,184,830 | 284.456 |
| 83 - WATONWAN | CN | 158,225 | 57,752,125 | 32.801 |
| 83 - WATONWAN | DT | 104 | 37,960 | 7.575 |
| 83 - WATONWAN | GV | 34,579 | 12,621,335 | 518.033 |
| 83 - WATONWAN | UN | 15,572 | 5,683,780 | 44.586 |
| 83 - WATONWAN | -----SUBTOTAL-------> | 452,823 | 165,280,030 | 887.451 |
| | | | | |
| 84 - WILKIN | BT | 220,789 | 80,587,985 | 347.911 |
| 84 - WILKIN | CN | 145,481 | 53,100,565 | 13.922 |
| 84 - WILKIN | DT | 18,020 | 6,577,300 | 329.113 |
| 84 - WILKIN | GV | 33,977 | 12,401,605 | 818.708 |
| 84 - WILKIN | UN | 1,141 | 416,465 | 4.752 |
| 84 - WILKIN | -----SUBTOTAL-------> | 419,409 | 153,083,920 | 1,514.406 |
| | | | | |
| 85 - WINONA | BB | 415 | 151,475 | 0.696 |
| 85 - WINONA | BT | 1,013,475 | 369,918,375 | 612.982 |
| 85 - WINONA | CN | 562,282 | 205,232,930 | 55.757 |
| 85 - WINONA | DT | 1,073 | 391,645 | 20.398 |
| 85 - WINONA | GV | 46,906 | 17,120,690 | 539.878 |
| 85 - WINONA | UN | 4,216 | 1,538,840 | 7.421 |
| 85 - WINONA | -----SUBTOTAL-------> | 1,628,366 | 594,353,955 | 1,237.132 |
| | | | | |
| 86 - WRIGHT | BB | 233 | 85,045 | 0.540 |
| 86 - WRIGHT | BT | 3,403,546 | 1,242,294,290 | 1,008.103 |
| 86 - WRIGHT | CN | 781,997 | 285,428,905 | 19.654 |
| 86 - WRIGHT | DT | 1,051 | 383,615 | 12.129 |
| 86 - WRIGHT | GV | 136,133 | 49,688,545 | 903.433 |

| | | | | |
|---|---|---|---|---|
| 86 - WRIGHT | UN | 35,032 | 12,786,680 | 95.116 |
| 86 - WRIGHT | -----SUBTOTAL-------> | 4,357,992 | 1,590,667,080 | 2,038.975 |
| | | | | |
| 87 - YELLOW MEDICINE | BT | 304,933 | 111,300,545 | 422.176 |
| 87 - YELLOW MEDICINE | CN | 7,518 | 2,744,070 | 1.930 |
| 87 - YELLOW MEDICINE | DT | 526 | 191,990 | 10.646 |
| 87 - YELLOW MEDICINE | GV | 57,861 | 21,119,265 | 1,051.648 |
| 87 - YELLOW MEDICINE | UN | 904 | 329,960 | 17.618 |
| 87 - YELLOW MEDICINE | -----SUBTOTAL-------> | 371,741 | 135,685,830 | 1,504.018 |
| | | | | |
| --- GRAND TOTAL ----> | | 157,287,658 | 57,410,002,470 | 141,042.083 |

## Consumer Info and Services

Home of one of Minnesota's leading sources of unbiased energy information, the Energy Info Center. **Check out our publications and tips, all designed to give you helpful, unbiased information so you can be a better consumer of energy, a more careful purchaser of real estate or insurance, a wiser telephone user ... and a lot more!** Also, find out how to file a complaint, look up licensed individuals and businesses, check on enforcement actions, and find rule making activity.


Rule Making
Request for Proposal
License Lookup
Look Up Ins. Cos. by Type
Financial Licensee Lists
Have a Complaint?
Do Not Call Info
All Publications & Tips
Order Publications/CD
Petrofund
Telecommunications
Minnesota Relay
For Military Personnel
Insurance
Buildings & Builders
Energy Info Center
- Home Energy Guides
- Bioenergy & Biofuels
- Solar
- Wind
  - Speculation in Wind Lease Rights
  - Can I have a wind turbine? (Wind FAQ)
  - Community-Based Energy Development (C-BED)
  - Wind Integration Study
  - Catch the Wind
  - Hiring a Renewable Energy Contractor
  - Wind Maps
  - Wind Rights to Private Land
  - Harvesting the Wind
  - Small Wind Energy Systems
  - Minnesota Wind Farms
  - WRAP Report
- Energy Incentives and Grants
- Lighting
- Kids Only!
- Energy Star
- Ice Dams

## Energy Info Center

### Wind Maps

Printable Content

The 2006 wind maps have been developed for the Department by WindLogics, a Minnesota company that is at the leading edge of wind resource assessment using atmospheric modeling. These 2006 maps show the wind speed resources at 30, 80, and 100 meters, as well as capacity factor and energy production estimates for a 1.65 MW wind turbine at 80 meters. In addition the maps have been developed at a finer resolution than the previous maps (500 meters vs. 750 meters).

### 2006 Wind Maps

- 30 Meter Wind Speed
- 80 Meter Wind Speed
- 80 Meter Capacity Factor
- 80 Meter Energy Production
- 100 Meter Wind Speed
- Month by Month -80 Meter Wind Speed (about 2 MB)
- Wind Map methodology discussed

### 2006 Wind Map GIS Files

*The files below can be imported into geographic information software*, such as ArcMap, for further analysis, review, and publication by external parties. Layers such as counties and roads and other information are not provided here but may be available through the Land Management Information Center at the Department of Administration. Each file is approximately 5.1 MB.

- 30 Meter Wind Speed
- 80 Meter Wind Speed
- 100 Meter Wind Speed


### More Energy Info

- Energy Policy Reports
- Energy Data & Stats
- Utility Conservation
- Facility Siting Information
- Conservation in residential buildings

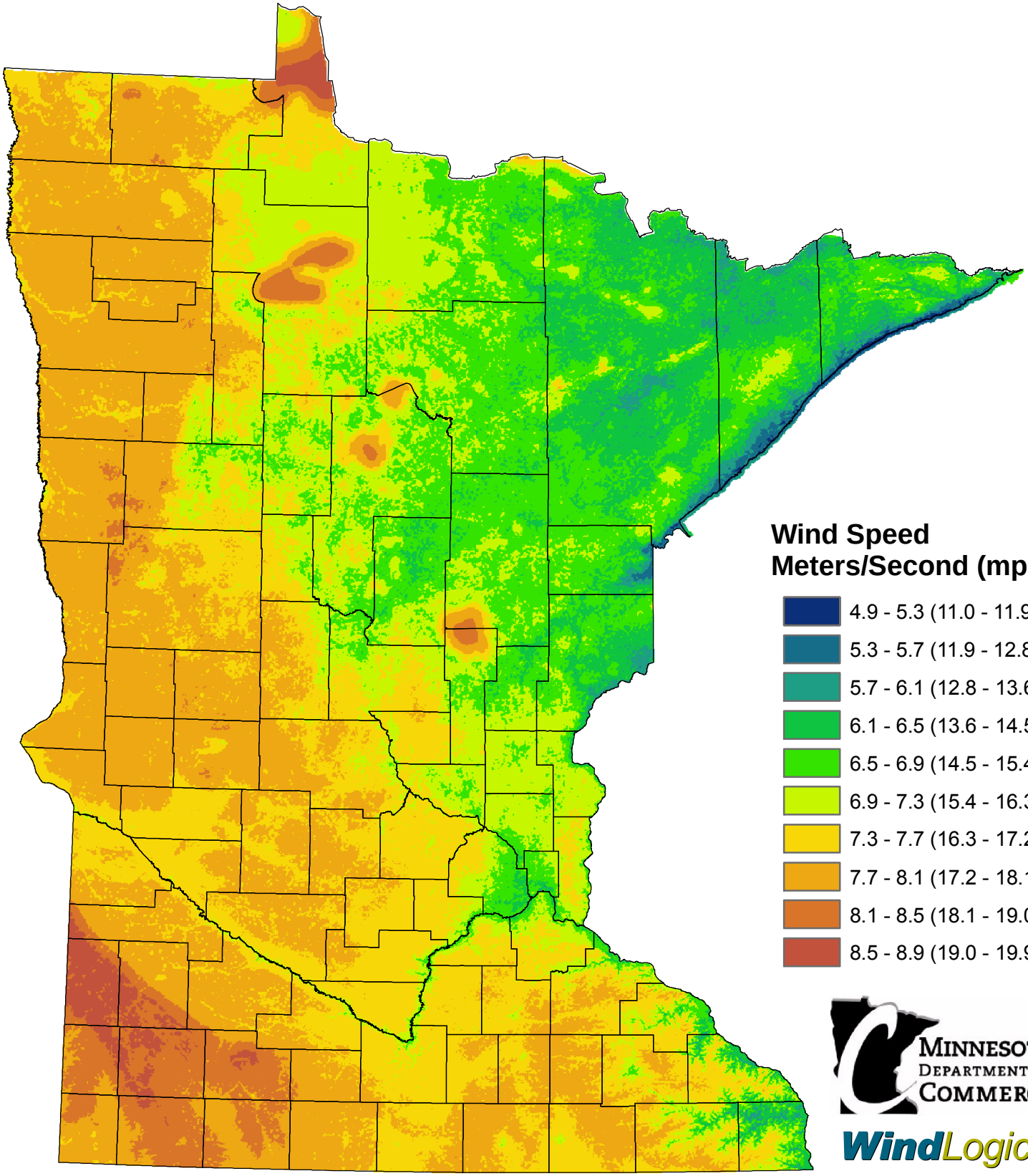
### Alternative Fuel Trip Planner


Need to know where to buy E85 or other alternative fuels? The US Department of Energy's Alternative Fuels and Advanced Vehicles Data Center has an online station locator. Just specify which kind of fuel you want, then enter your address or route, and the locator will map out the closest stations that sell that fuel.

Gasoline Pricing Info
- Links to Utilities
- Sound Advice - Energy
- Keeping Cool
- Plug-in Vehicles
- Additional Publications
- Next Generation Energy
- Natural Gas Prices
- E85
- Energy Tips
- Heating Central
- Hydrogen and Fuel Cells

Enforcement Actions
Financial Services
Real Estate & Mortgage
Weights & Measures

# Minnesota's Wind Resource by Wind Speed at 80 Meters




MINNESOTA DEPARTMENT OF COMMERCE

WindLogics®

This map has been prepared under contract by WindLogics for the Department of Commerce using the best available weather data sources and the latest physics-based weather modeling technology and statistical techniques. The data that were used to develop the map have been statistically adjusted to accurately represent long-term (40 year) wind speeds over the state, thereby incorporating important decadal weather trends and cycles. Data has been averaged over a cell area 500 meters square, and within any one cell there could be features that increase or decrease the values shown on this map. This map shows the general variation of Minnesota's wind resource and should not be used to determine the performance of specific projects.

*January 2006*

# U.S. Solar Radiation Resource Maps:

## Atlas for the *Solar Radiation Data Manual for Flat-Plate and Concentrating Collectors*

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These maps show the general trends in the amount of solar radiation received in the United States and its territories. They are spatial interpolations of solar radiation values derived from the 1961-1990 National Solar Radiation Data Base (NSRDB) and published in the Solar Radiation Data Manual for Flat-Plate and Concentrating Collectors. The data from which these maps were generated can be found one directory down at http://rredc.nrel.gov/solar/old_data/nsrdb/redbook.

---

### 1. Select data type

Maps of minimum, maximum, and average solar radiation data are available. Maps of average values are produced by averaging all 30 years of data for each site. Maps of minimum and maximum values are composites of specific months and years for which each site achieved its minimum or maximum amounts of solar radiation. Click on the button next to the type of solar radiation map you want to see.

| | | |
|---|---|---|
| ◉ **Average** | ○ **Minimum** | ○ **Maximum** |

---

### 2. Select a month

To see the 30-year averages for a particular month, click on the button next to that month. To see the overall 30-year average solar radiation atlas for all months, click on the button next to "Annual".

| | | | |
|---|---|---|---|
| ◉ **January** | ○ **February** | ○ **March** | ○ **April** |
| ○ **May** | ○ **June** | ○ **July** | ○ **August** |
| ○ **September** | ○ **October** | ○ **November** | ○ **December** |
| ○ **Annual** | | | |

---

### 3. Select an instrument orientation

Data from fourteen different collector orientations were used to make the solar atlas. Choose the orientation from the following list:

For descriptions from the *Manual* click here.

| |
|---|
| ◉ **Single Axis Tracking Concentrator, East-West Axis** |
| ○ **North-South Axis Tracking Concentrator Tilted at Latitude** |
| ○ **North-South Axis Tracking Concentrator** |

- Two Axis Tracking Concentrator
- Two Axis Tracking Flat Plate
- Flat Plate Tilted South at Latitude
- Flat Plate Tilted South at Latitude - 15 Degrees
- Flat Plate Tilted South at Latitude + 15 Degrees
- Horizontal Flat Plate
- South Facing Vertical Flat Plate
- North-South Axis Tracking Flat Plate
- North-South Axis Tracking Flat Plate Tilted at Latitude
- North-South Axis Tracking Flat Plate Tilted at Latitude - 15 Degrees
- North-South Axis Tracking Flat Plate Tilted at Latitude + 15 Degrees

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## 4. View the map (by pushing this button): View The Map

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Return to RReDC home page ( *http://rredc.nrel.gov* )

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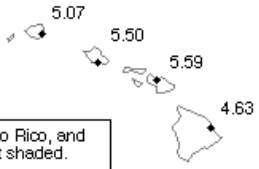
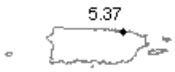
**Alaska**

**Hawaii**




Hawaii, Puerto Rico, and Guam are not shaded.

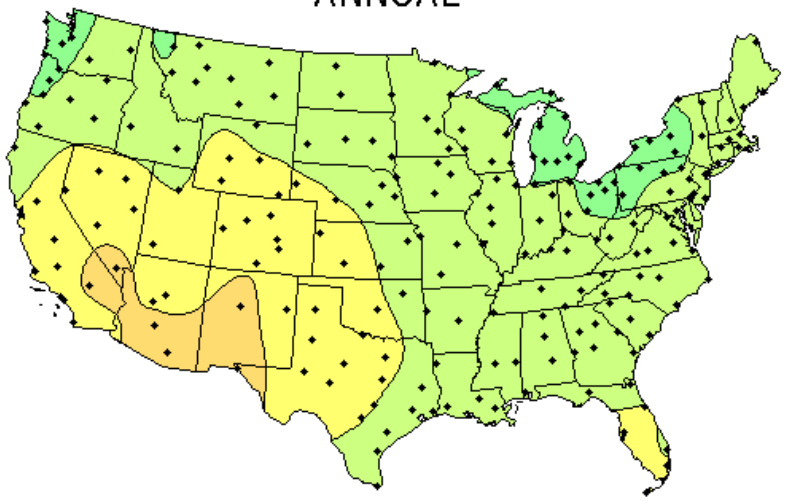
**San Juan, PR**




**Guam, PI**


# Average Daily Solar Radiation Per Month

## ANNUAL



**Flat Plate Tilted South at Latitude + 15 Degrees**

### Collector Orientation

Flat-plate collector facing south at fixed tilt equal to the latitude of the site plus 15 degrees: To optimize performance in the winter, this tilt angle is recommended.

This map shows the general trends in the amount of solar radiation received in the United States and its territories. It is a spatial interpolation of solar radiation values derived from the 1961-1990 National Solar Radiation Data Base (NSRDB). The dots on the map represent the 239 sites of the NSRDB.

Maps of average values are produced by averaging all 30 years of data for each site. Maps of maximum and minimum values are composites of specific months and years for which each site achieved its maximum or minimum amounts of solar radiation.

Though useful for identifying general trends, this map should be used with caution for site-specific resource evaluations because variations in solar radiation not reflected in the maps can exist, introducing uncertainty into resource estimates.

Maps are not drawn to scale.

NREL

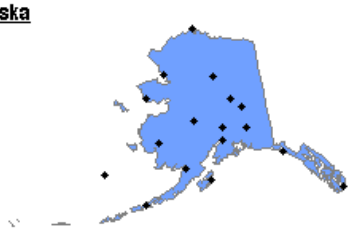
**National Renewable Energy Laboratory**
**Resource Assessment Program**

**kWh/m$^2$/day**

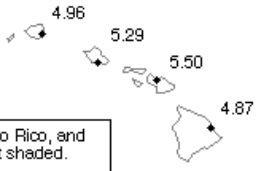
| | |
|---|---|
| | 10 to 14 |
| | 8 to 10 |
| | 7 to 8 |
| | 6 to 7 |
| | 5 to 6 |
| | 4 to 5 |
| | 3 to 4 |
| | 2 to 3 |
| | 0 to 2 |
| | none |

FP15A13-286

**Alaska**

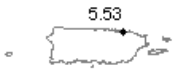


**Hawaii**




Hawaii, Puerto Rico, and Guam are not shaded.

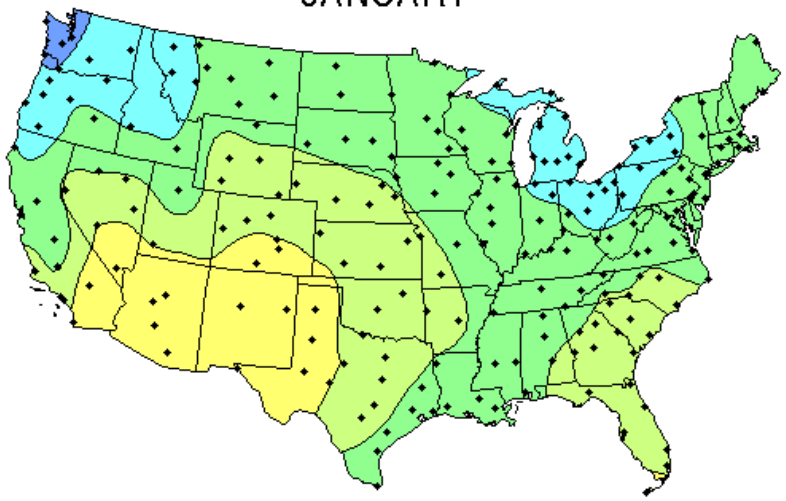
**San Juan, PR**




**Guam, PI**


# Average Daily Solar Radiation Per Month

## JANUARY



**Flat Plate Tilted South at Latitude + 15 Degrees**

### Collector Orientation

Flat-plate collector facing south at fixed tilt equal to the latitude of the site plus 15 degrees: To optimize performance in the winter, this tilt angle is recommended.

This map shows the general trends in the amount of solar radiation received in the United States and its territories. It is a spatial interpolation of solar radiation values derived from the 1961-1990 National Solar Radiation Data Base (NSRDB). The dots on the map represent the 239 sites of the NSRDB.

Maps of average values are produced by averaging all 30 years of data for each site. Maps of maximum and minimum values are composites of specific months and years for which each site achieved its maximum or minimum amounts of solar radiation.

Though useful for identifying general trends, this map should be used with caution for site-specific resource evaluations because variations in solar radiation not reflected in the maps can exist, introducing uncertainty into resource estimates.

Maps are not drawn to scale.

NREL

**National Renewable Energy Laboratory**
**Resource Assessment Program**

**kWh/m$^2$/day**

| | |
|---|---|
| | 10 to 14 |
| | 8 to 10 |
| | 7 to 8 |
| | 6 to 7 |
| | 5 to 6 |
| | 4 to 5 |
| | 3 to 4 |
| | 2 to 3 |
| | 0 to 2 |
| | none |

FP15A01-274

# Table CE1-10c. Total Energy Consumption in U.S. Households by Midwest Census Region, 2001

| | Total U.S. | Midwest Census Region | | | RSE Row Factors |
|---|---|---|---|---|---|
| | | Total | Census Division | | |
| | | | East North Central | West North Central | |
| RSE Column Factor: | 0.5 | 1.0 | 1.2 | 1.5 | |
| | **Million Households** | | | | |
| **Total U.S. Households** | 107.0 | 24.5 | 17.1 | 7.4 | NE |
| **Number of Households, Fuels Used (more than one may apply):** | | | | | |
| Electricity[1] | 107.0 | 24.5 | 17.1 | 7.4 | NE |
| Natural Gas | 66.9 | 19.4 | 14.2 | 5.2 | 3.9 |
| Fuel Oil | 8.7 | 0.9 | 0.5 | 0.4 | 15.2 |
| Kerosene | 2.9 | 0.5 | 0.4 | Q | 14.6 |
| LPG | 9.4 | 2.3 | 1.1 | 1.2 | 22.0 |
| Wood | 14.5 | 2.5 | 1.4 | 1.1 | 13.1 |
| | **Quadrillion Btu** | | | | |
| **Total Btu Consumption, Fuels Used:** | | | | | |
| Electricity | | | | | |
| Primary | 11.63 | 2.43 | 1.60 | 0.83 | 2.5 |
| Site | 3.89 | 0.81 | 0.54 | 0.28 | 2.5 |
| Natural Gas | 4.84 | 1.84 | 1.39 | 0.44 | 5.0 |
| Fuel Oil | 0.71 | 0.06 | 0.03 | 0.03 | 18.8 |
| Kerosene | 0.05 | (*) | Q | Q | 35.4 |
| LPG | 0.38 | 0.15 | 0.07 | 0.08 | 23.3 |
| Wood | 0.37 | 0.09 | 0.06 | 0.03 | 27.7 |
| Total (excludes primary electricity and wood) | 9.86 | 2.86 | 2.03 | 0.83 | 2.2 |
| | **Physical Units** | | | | |
| **Physical Units of Total Consumption, Fuels Used:** | | | | | |
| Electricity (billion kWh) | 1,140 | 238 | 157 | 81 | 2.5 |
| Natural Gas (billion cf) | 4,708 | 1,784 | 1,352 | 432 | 5.0 |
| Fuel Oil (million gallons) | 5,105 | 437 | 234 | 203 | 18.9 |
| Kerosene (million gallons) | 348 | 23 | Q | Q | 35.4 |
| LPG (million gallons) | 4,121 | 1,607 | 767 | 840 | 23.3 |
| Wood (million cords) | 18.7 | 4.6 | 3.0 | 1.6 | 27.7 |
| | **Million Btu per Household[2]** | | | | |
| **Total Btu Consumption per Household, Fuels Used:** | | | | | |
| Electricity | | | | | |
| Primary | 108.7 | 99.2 | 93.9 | 111.5 | 2.5 |
| Site | 36.4 | 33.2 | 31.4 | 37.3 | 2.5 |
| Natural Gas | 72.4 | 94.7 | 98.2 | 85.0 | 2.8 |
| Fuel Oil | 81.7 | 68.4 | 63.3 | 75.4 | 11.0 |
| Kerosene | 16.1 | 6.5 | Q | Q | 30.0 |
| LPG | 40.2 | 63.7 | 63.4 | 63.9 | 7.2 |
| Wood | 25.9 | 36.7 | 42.3 | 29.3 | 18.4 |
| Total (excludes primary electricity and wood) | 92.2 | 116.7 | 118.9 | 111.6 | 2.2 |

See footnotes at end of table.

# Table CE1-10c. Total Energy Consumption in U.S. Households by Midwest Census Region, 2001 (Continued)

| | Total U.S. | Midwest Census Region | | | RSE Row Factors |
|---|---|---|---|---|---|
| | | Total | Census Division | | |
| | | | East North Central | West North Central | |
| RSE Column Factor: | 0.5 | 1.0 | 1.2 | 1.5 | |
| | **Physical Units per Household**[2] | | | | |
| **Physical Units of Total Consumption per Household, Fuels Used:** | | | | | |
| Electricity (kWh) | 10,656 | 9,727 | 9,206 | 10,930 | 2.5 |
| Natural Gas (thousand cf) | 70 | 92 | 95 | 83 | 2.8 |
| Fuel Oil (gallons) | 589 | 494 | 456 | 546 | 11.0 |
| Kerosene (gallons) | 119 | 48 | Q | Q | 30.0 |
| LPG (gallons) | 440 | 697 | 694 | 700 | 7.2 |
| Wood (cords) | 1.3 | 1.8 | 2.1 | 1.5 | 18.4 |
| | **Million Households** | | | | |
| **Number of Households, Where the End Use Is:** | | | | | |
| Space Heating[3] | 105.3 | 24.4 | 17.0 | 7.3 | NE |
| Electric Air-Conditioning[4] | 80.8 | 20.2 | 13.4 | 6.7 | 2.3 |
| Water Heating[5] | 106.7 | 24.5 | 17.1 | 7.4 | NE |
| Refrigerators | 106.8 | 24.5 | 17.1 | 7.4 | NE |
| Appliances | 107.0 | 24.5 | 17.1 | 7.4 | NE |
| | **Quadrillion Btu**[a] | | | | |
| **Total Btu Consumption, Where the End Use Is:** | | | | | |
| Space Heating | 4.62 | 1.63 | 1.18 | 0.45 | 3.1 |
| Electric Air-Conditioning | 0.62 | 0.10 | 0.06 | 0.04 | 5.2 |
| Water Heating | 1.68 | 0.43 | 0.30 | 0.12 | 2.6 |
| Refrigerators | 0.53 | 0.12 | 0.08 | 0.04 | 2.1 |
| Other Appliances and Lighting | 2.40 | 0.58 | 0.41 | 0.17 | 2.1 |
| | **Million Btu per Household**[2,a] | | | | |
| **Total Btu Consumption per Household, Where the End Use Is:** | | | | | |
| Space Heating | 43.9 | 66.8 | 69.3 | 61.2 | 3.0 |
| Electric Air-Conditioning | 7.7 | 5.1 | 4.6 | 6.0 | 4.3 |
| Water Heating | 15.8 | 17.4 | 17.7 | 16.8 | 2.6 |
| Refrigerators | 5.0 | 4.9 | 4.8 | 5.2 | 2.1 |
| Other Appliances and Lighting | 22.5 | 23.7 | 23.9 | 23.4 | 2.1 |

[1] The RECS cannot be used to accurately estimate the number of households that do not use electricity.

[2] The averages for total and for appliances are over the set of all households; otherwise the averages are over the set of households using a given fuel or over the set using a given end use.

[3] Households where the main or secondary space-heating fuel is electricity, natural gas, fuel oil, kerosene, or LPG.

[4] The number of households, where the end use is electric air-conditioning, does **not** include households that did not use their equipment (0.9 million). It does include the small number of households where the fuel for central air-conditioning equipment was something other than electricity; those households were treated as if the fuel was electricity.

[5] Households where the main or secondary water-heating fuel is electricity, natural gas, fuel oil, kerosene, or LPG.

[a] The row factor in this section is underestimated because it contains no error for estimating the end-use.

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

NE = RSE row factor not estimated because RSE's for all statistics in this row are between 0.0 and 1.0 percent.

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

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

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A-G of the 2001 Residential Energy Consumption Survey.

# Table CE1-2c. Total Energy Consumption in U.S. Households by Year of Construction, 2001

| | Total | Year of Construction | | | | | | RSE Row Factors |
|---|---|---|---|---|---|---|---|---|
| | | 1990 to 2001[1] | 1980 to 1989 | 1970 to 1979 | 1960 to 1969 | 1950 to 1959 | 1949 or Before | |
| RSE Column Factor: | 0.5 | 1.6 | 1.1 | 1.0 | 1.1 | 1.1 | 0.9 | |
| | **Million Households** | | | | | | | |
| **Total U.S. Households** | 107.0 | 15.5 | 18.2 | 18.8 | 13.8 | 14.2 | 26.6 | 4.3 |
| **Number of Households, Fuels Used (more than one may apply):** | | | | | | | | |
| Electricity[2] | 107.0 | 15.5 | 18.2 | 18.8 | 13.8 | 14.2 | 26.6 | 4.3 |
| Natural Gas | 66.9 | 9.4 | 8.8 | 9.0 | 9.5 | 10.3 | 20.0 | 5.9 |
| Fuel Oil | 8.7 | 0.3 | 0.5 | 0.9 | 1.3 | 1.8 | 3.9 | 15.5 |
| Kerosene | 2.9 | 0.4 | 0.3 | 0.7 | 0.4 | 0.3 | 0.8 | 20.8 |
| LPG | 9.4 | 1.4 | 1.5 | 1.7 | 1.1 | 1.0 | 2.6 | 13.9 |
| Wood | 14.5 | 2.0 | 3.0 | 3.2 | 2.0 | 1.7 | 2.5 | 9.9 |
| | **Quadrillion Btu** | | | | | | | |
| **Total Btu Consumption, Fuels Used:** | | | | | | | | |
| Electricity | | | | | | | | |
| Primary | 11.63 | 2.02 | 2.33 | 2.29 | 1.35 | 1.38 | 2.26 | 4.7 |
| Site | 3.89 | 0.68 | 0.78 | 0.77 | 0.45 | 0.46 | 0.76 | 4.7 |
| Natural Gas | 4.84 | 0.66 | 0.57 | 0.57 | 0.61 | 0.75 | 1.68 | 6.9 |
| Fuel Oil | 0.71 | 0.02 | 0.04 | 0.07 | 0.09 | 0.14 | 0.34 | 17.8 |
| Kerosene | 0.05 | 0.01 | (*) | 0.02 | Q | (*) | 0.01 | 32.0 |
| LPG | 0.38 | 0.06 | 0.06 | 0.07 | 0.04 | 0.03 | 0.13 | 17.6 |
| Wood | 0.37 | 0.03 | 0.06 | 0.07 | 0.04 | 0.05 | 0.12 | 18.1 |
| Total (excludes primary electricity and wood) | 9.86 | 1.43 | 1.45 | 1.48 | 1.19 | 1.39 | 2.92 | 4.5 |
| | **Physical Units** | | | | | | | |
| **Physical Units of Total Consumption, Fuels Used:** | | | | | | | | |
| Electricity (billion kWh) | 1,140 | 198 | 229 | 225 | 132 | 135 | 221 | 4.7 |
| Natural Gas (billion cf) | 4,708 | 645 | 551 | 551 | 594 | 732 | 1,635 | 6.9 |
| Fuel Oil (million gallons) | 5,105 | 173 | 321 | 486 | 630 | 1,034 | 2,461 | 17.8 |
| Kerosene (million gallons) | 348 | 66 | 34 | 121 | Q | 24 | 68 | 32.0 |
| LPG (million gallons) | 4,121 | 620 | 619 | 719 | 420 | 286 | 1,457 | 17.6 |
| Wood (million cords) | 18.7 | 1.5 | 3.0 | 3.7 | 2.1 | 2.4 | 6.0 | 18.1 |
| | **Million Btu per Household[3]** | | | | | | | |
| **Total Btu Consumption per Household, Fuels Used:** | | | | | | | | |
| Electricity | | | | | | | | |
| Primary | 108.7 | 130.9 | 127.9 | 122.1 | 97.8 | 97.2 | 85.0 | 2.9 |
| Site | 36.4 | 43.8 | 42.8 | 40.8 | 32.7 | 32.5 | 28.4 | 2.9 |
| Natural Gas | 72.4 | 70.9 | 64.3 | 63.0 | 64.6 | 72.9 | 84.3 | 3.5 |
| Fuel Oil | 81.7 | 77.8 | 91.4 | 77.3 | 68.3 | 79.0 | 87.5 | 7.2 |
| Kerosene | 16.1 | 21.3 | 13.5 | 23.2 | Q | 11.4 | 11.6 | 26.1 |
| LPG | 40.2 | 41.1 | 36.6 | 37.5 | 34.2 | 26.3 | 51.6 | 10.8 |
| Wood | 25.9 | 14.8 | 20.0 | 23.0 | 21.1 | 27.6 | 48.5 | 14.9 |
| Total (excludes primary electricity and wood) | 92.2 | 92.5 | 79.7 | 79.0 | 86.5 | 97.9 | 109.8 | 2.4 |

See footnotes at end of table.

# Table CE1-2c. Total Energy Consumption in U.S. Households by Year of Construction, 2001 (Continued)

| | | Year of Construction | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total | 1990 to 2001[1] | 1980 to 1989 | 1970 to 1979 | 1960 to 1969 | 1950 to 1959 | 1949 or Before | RSE Row Factors |
| RSE Column Factor: | 0.5 | 1.6 | 1.1 | 1.0 | 1.1 | 1.1 | 0.9 | |
| **Physical Units per Household[3]** | | | | | | | | |
| **Physical Units of Total Consumption per Household, Fuels Used:** | | | | | | | | |
| Electricity (kWh) | 10,656 | 12,827 | 12,534 | 11,971 | 9,586 | 9,533 | 8,332 | 2.9 |
| Natural Gas (thousand cf) | 70 | 69 | 63 | 61 | 63 | 71 | 82 | 3.5 |
| Fuel Oil (gallons) | 589 | 561 | 659 | 557 | 493 | 570 | 631 | 7.2 |
| Kerosene (gallons) | 119 | 157 | 100 | 172 | Q | 84 | 86 | 26.1 |
| LPG (gallons) | 440 | 450 | 401 | 411 | 374 | 288 | 565 | 10.8 |
| Wood (cords) | 1.3 | 0.7 | 1.0 | 1.2 | 1.1 | 1.4 | 2.4 | 14.9 |
| **Million Households** | | | | | | | | |
| **Number of Households, Where the End Use Is:** | | | | | | | | |
| Space Heating[4] | 105.3 | 15.4 | 18.1 | 18.5 | 13.4 | 13.8 | 26.2 | 4.3 |
| Electric Air-Conditioning[5] | 80.8 | 13.4 | 15.8 | 14.2 | 10.1 | 10.2 | 17.1 | 4.7 |
| Water Heating[6] | 106.7 | 15.4 | 18.2 | 18.7 | 13.7 | 14.2 | 26.4 | 4.3 |
| Refrigerators | 106.8 | 15.5 | 18.2 | 18.7 | 13.8 | 14.1 | 26.5 | 4.3 |
| Appliances | 107.0 | 15.5 | 18.2 | 18.8 | 13.8 | 14.2 | 26.6 | 4.3 |
| **Quadrillion Btu[a]** | | | | | | | | |
| **Total Btu Consumption, Where the End Use Is:** | | | | | | | | |
| Space Heating | 4.62 | 0.54 | 0.53 | 0.60 | 0.55 | 0.69 | 1.70 | 5.3 |
| Electric Air-Conditioning | 0.62 | 0.13 | 0.14 | 0.13 | 0.07 | 0.07 | 0.09 | 7.0 |
| Water Heating | 1.68 | 0.27 | 0.27 | 0.25 | 0.21 | 0.24 | 0.44 | 4.6 |
| Refrigerators | 0.53 | 0.08 | 0.10 | 0.10 | 0.07 | 0.07 | 0.12 | 4.5 |
| Other Appliances and Lighting | 2.40 | 0.41 | 0.41 | 0.40 | 0.29 | 0.31 | 0.58 | 4.7 |
| **Million Btu per Household[3,a]** | | | | | | | | |
| **Total Btu Consumption per Household, Where the End Use Is:** | | | | | | | | |
| Space Heating | 43.9 | 35.2 | 29.4 | 32.6 | 41.3 | 50.4 | 64.9 | 3.6 |
| Electric Air-Conditioning | 7.7 | 9.7 | 9.0 | 8.9 | 6.9 | 6.7 | 5.1 | 5.2 |
| Water Heating | 15.8 | 17.3 | 14.8 | 13.6 | 15.6 | 16.8 | 16.6 | 2.7 |
| Refrigerators | 5.0 | 5.1 | 5.3 | 5.3 | 4.8 | 5.1 | 4.5 | 2.6 |
| Other Appliances and Lighting | 22.5 | 26.7 | 22.7 | 21.4 | 20.9 | 22.2 | 21.6 | 2.7 |

[1] New construction for 2001 includes only those housing units built and occupied between January and the April-August period when the household interviews were conducted.

[2] The RECS cannot be used to accurately estimate the number of households that do not use electricity.

[3] The averages for total and for appliances are over the set of all households; otherwise the averages are over the set of households using a given fuel or over the set using a given end use.

[4] Households where the main or secondary space-heating fuel is electricity, natural gas, fuel oil, kerosene, or LPG.

[5] The number of households, where the end use is electric air-conditioning, does **not** include households that did not use their equipment (0.9 million). It does include the small number of households where the fuel for central air-conditioning equipment was something other than electricity; those households were treated as if the fuel was electricity.

[6] Households where the main or secondary water-heating fuel is electricity, natural gas, fuel oil, kerosene, or LPG.

[a] The row factor in this section is underestimated because it contains no error for estimating the end-use.

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

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

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

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-457 A-G of the 2001 Residential Energy Consumption Survey.

**Table 1.2 First Use of Energy for All Purposes (Fuel and Nonfuel), 2002;**
**Level: National and Regional Data;**
**Row: NAICS Codes; Column: Energy Sources and Shipments;**
**Unit: Trillion Btu.**

| NAICS Code(a) | Subsector and Industry | Total(b) | Net Electricity(c) | Residual Fuel Oil | Distillate Fuel Oil(d) | Natural Gas(e) | LPG and NGL(f) | Coal | Coke and Breeze | Other(g) | Shipments of Energy Sources Produced Onsite(h) | RSE Row Factors |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Total United States** | | | | | | | | | | | |
| | **RSE Column Factors:** | 0.9 | 1 | 1.2 | 1.8 | 1 | 1.6 | 0.8 | 0.9 | 1.2 | 0.4 | |
| 311 | Food | 1,123 | 230 | 13 | 19 | 582 | 5 | 184 | 1 | 89 | 0 | 6.8 |
| 311221 | Wet Corn Milling | 217 | 23 | * | * | 61 | * | 121 | 0 | 11 | 0 | 1.1 |
| 31131 | Sugar | 112 | 2 | 2 | 1 | 22 | * | 37 | 1 | 46 | 0 | 0.9 |
| 311421 | Fruit and Vegetable Canning | 47 | 7 | 1 | 1 | 36 | Q | 0 | 0 | 1 | 0 | 11 |
| 312 | Beverage and Tobacco Products | 105 | 26 | 2 | 2 | 46 | 1 | 17 | 0 | 11 | 0 | 4 |
| 3121 | Beverages | 85 | 22 | 1 | 2 | 42 | 1 | 8 | 0 | 10 | 0 | 5.4 |
| 3122 | Tobacco | 20 | 4 | 1 | * | 4 | * | 10 | 0 | 1 | 0 | 0.9 |
| 313 | Textile Mills | 207 | 86 | 4 | 2 | 75 | 2 | 22 | 0 | 15 | 0 | 14.3 |
| 314 | Textile Product Mills | 60 | 17 | 2 | Q | 29 | 1 | Q | 0 | Q | 0 | 20.1 |
| 315 | Apparel | 30 | 12 | * | 1 | 16 | * | 0 | 0 | * | 0 | 21.4 |
| 316 | Leather and Allied Products | 7 | 2 | * | * | 4 | * | 0 | 0 | * | 0 | 7.8 |
| 321 | Wood Products | 377 | 72 | 1 | 13 | 57 | 5 | 1 | 0 | 228 | 0 | 4.1 |
| 321113 | Sawmills | 127 | 20 | * | 6 | 10 | 1 | 0 | 0 | 91 | 0 | 4.7 |
| 3212 | Veneer, Plywood, and Engineered Woods | 167 | 33 | 1 | 2 | 33 | 3 | 1 | 0 | 95 | 0 | 4.7 |
| 3219 | Other Wood Products | 73 | 18 | * | 2 | 11 | 1 | 0 | 0 | 40 | 0 | 8.2 |
| 322 | Paper | 2,363 | 223 | 100 | 13 | 504 | 6 | 236 | 4 | 1,276 | 0 | 1.8 |
| 322110 | Pulp Mills | 224 | 5 | W | 5 | 24 | * | W | 0 | 175 | 0 | 0.9 |
| 322121 | Paper Mills, except Newsprint | 1,002 | 78 | 47 | 4 | 206 | 1 | 139 | 4 | 523 | 0 | 1.7 |
| 322122 | Newsprint Mills | 94 | 38 | W | * | 16 | * | W | 0 | 27 | 0 | 0.9 |
| 322130 | Paperboard Mills | 908 | 56 | 34 | 4 | 188 | * | 84 | 0 | 542 | 0 | 2.1 |
| 323 | Printing and Related Support | 98 | 50 | * | * | 46 | 1 | 0 | 0 | 1 | 0 | 10.6 |
| 324 | Petroleum and Coal Products | 6,799 | 127 | 25 | 19 | 878 | 24 | Q | 2 | 5,520 | 83 | 3.4 |
| 324110 | Petroleum Refineries | 6,391 | 121 | 21 | 5 | 821 | 20 | * | 0 | 5,404 | 0 | 3 |
| 324199 | Other Petroleum and Coal Products | Q | -2 | * | * | 5 | * | Q | 2 | 108 | 81 | 1.3 |
| 325 | Chemicals | 6,465 | 522 | 87 | 14 | 2,307 | 3,001 | 344 | 6 | 687 | 504 | 5.3 |
| 325110 | Petrochemicals | 889 | W | W | * | 209 | 932 | W | 0 | 80 | 368 | 1.2 |
| 325120 | Industrial Gases | 204 | W | 0 | * | W | W | 0 | 0 | Q | 0 | 3.1 |
| 325181 | Alkalies and Chlorine | 191 | 42 | * | * | W | W | 20 | 0 | 15 | W | 1.3 |
| 325182 | Carbon Black | 88 | 2 | 57 | * | 20 | * | 0 | 0 | 9 | 0 | 0.8 |
| 325188 | Other Basic Inorganic Chemicals | 218 | 88 | 2 | 2 | 77 | 11 | 19 | 2 | 17 | * | 1.8 |
| 325192 | Cyclic Crudes and Intermediates | 99 | 12 | * | * | 43 | 19 | * | 0 | 24 | 0 | 0.9 |
| 325193 | Ethyl Alcohol | 60 | W | 0 | * | 30 | * | 19 | 0 | 7 | W | 4.6 |
| 325199 | Other Basic Organic Chemicals | 1,833 | 78 | W | 2 | 587 | 719 | W | 0 | 370 | 98 | 6.9 |
| 325211 | Plastics Materials and Resins | 1,821 | 73 | 1 | 1 | 414 | 1,284 | 27 | * | 54 | 34 | 4.5 |
| 325212 | Synthetic Rubber | 57 | 6 | * | * | 29 | 5 | 5 | 0 | 12 | * | 4.3 |
| 325222 | Noncellulosic Organic Fibers | 63 | W | 2 | * | 31 | * | W | 0 | 5 | 0 | 1.5 |
| 325311 | Nitrogenous Fertilizers | 497 | 12 | 0 | * | 484 | * | * | 0 | 1 | 0 | 0.9 |
| 325312 | Phosphatic Fertilizers | 38 | 3 | 1 | 1 | 30 | * | 1 | 1 | 1 | 0 | 0.9 |
| 3254 | Pharmaceuticals and Medicines | 119 | 37 | 2 | 3 | 62 | * | 9 | 0 | 7 | 0 | 4.7 |
| 325412 | Pharmaceutical Preparation | 84 | 28 | 2 | 1 | 40 | * | 9 | 0 | 4 | 0 | 5.5 |
| 325992 | Photographic Film, Paper, Plate, and Chemicals | 29 | W | 1 | * | 7 | * | W | 0 | * | 0 | 5.8 |
| 326 | Plastics and Rubber Products | 351 | 181 | 7 | 2 | 128 | 6 | Q | 0 | 5 | 0 | 9.8 |
| 327 | Nonmetallic Mineral Products | 1,059 | 141 | 3 | 34 | 422 | 3 | 309 | 11 | 136 | 0 | 3.6 |
| 3272 | Glass and Glass Products | 201 | 42 | W | W | 153 | 1 | * | 0 | 5 | 0 | 2.1 |
| 327211 | Flat Glass | 63 | 6 | W | W | 52 | * | * | 0 | 3 | 0 | 0.9 |
| 327213 | Glass Containers | 66 | 13 | 0 | * | 52 | * | 0 | 0 | * | 0 | 0.8 |
| 327310 | Cements | 409 | 43 | 1 | 6 | 21 | * | 236 | 8 | 95 | 0 | 1.8 |
| 327410 | Lime | 106 | 5 | 1 | 1 | 8 | * | 66 | * | 26 | 0 | 0.9 |

**Table 1.2 First Use of Energy for All Purposes (Fuel and Nonfuel), 2002;**
**Level: National and Regional Data;**
**Row: NAICS Codes; Column: Energy Sources and Shipments;**
**Unit: Trillion Btu.**

| NAICS Code(a) | Subsector and Industry | Total(b) | Net Electricity(c) | Residual Fuel Oil | Distillate Fuel Oil(d) | Natural Gas(e) | LPG and NGL(f) | Coal | Coke and Breeze | Other(g) | Shipments of Energy Sources Produced Onsite(h) | RSE Row Factors |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 327993 | Mineral Wool | 52 | 13 | 0 | * | 35 | * | 0 | 3 | * | 0 | 2.4 |
| 331 | Primary Metals | 2,120 | 493 | 1 | 15 | 704 | 3 | 515 | 355 | 178 | 143 | 1.8 |
| 331111 | Iron and Steel Mills | 1,308 | 184 | 1 | 10 | 417 | * | 498 | 319 | 23 | 143 | 2 |
| 331112 | Electrometallurgical Ferroalloy Products | 27 | 12 | 0 | * | 7 | * | 5 | * | 2 | 0 | 3.4 |
| 3312 | Steel Products from Purchased Steel | 45 | 16 | * | * | 24 | * | * | * | Q | 0 | 9.5 |
| 3313 | Alumina and Aluminum | 473 | 193 | * | 1 | 135 | 1 | * | * | 143 | 0 | 1.6 |
| 331312 | Primary Aluminum | 325 | W | * | * | 20 | * | * | 0 | W | 0 | 0.9 |
| 3314 | Nonferrous Metals, except Aluminum | 101 | 34 | * | 2 | 44 | 1 | 9 | 8 | 5 | 0 | 3.7 |
| 3315 | Foundries | 165 | 54 | * | 1 | 77 | 1 | 2 | 28 | 1 | 0 | 3 |
| 331511 | Iron Foundries | 87 | 28 | 0 | 1 | 27 | * | 1 | 28 | 1 | 0 | 3.5 |
| 331521 | Aluminum Die-Casting Foundries | 23 | 6 | * | * | 16 | * | 0 | 0 | * | 0 | 2.2 |
| 331524 | Aluminum Foundries, except Die-Casting | 19 | 5 | * | * | 14 | * | 0 | 0 | * | 0 | 4.3 |
| 332 | Fabricated Metal Products | 388 | 161 | Q | 6 | 210 | 3 | 1 | Q | 3 | 0 | 15.3 |
| 333 | Machinery | 177 | 84 | * | 3 | 82 | 3 | 1 | 0 | 4 | 0 | 10.2 |
| 334 | Computer and Electronic Products | 201 | 131 | 1 | 1 | 65 | * | * | 0 | 3 | 0 | 15.7 |
| 334413 | Semiconductors and Related Devices | 67 | 44 | * | * | 21 | * | 0 | 0 | 1 | 0 | 4.7 |
| 335 | Electrical Equip., Appliances, and Components | 172 | 47 | * | 1 | 53 | 1 | * | * | 70 | 0 | 8.2 |
| 336 | Transportation Equipment | 429 | 172 | 6 | 4 | 203 | 4 | 8 | Q | 30 | 0 | 5.1 |
| 336112 | Light Trucks and Utility Vehicles | 57 | W | * | 1 | 36 | * | W | 0 | 3 | 0 | 0.9 |
| 337 | Furniture and Related Products | 64 | 24 | * | 1 | 25 | 1 | 1 | 0 | 11 | 0 | 9.5 |
| 339 | Miscellaneous | 71 | 35 | * | 1 | 32 | 1 | 0 | 0 | 2 | 0 | 8.3 |
| | Total | 22,666 | 2,839 | 255 | 152 | 6,468 | 3,070 | 1,956 | 385 | 8,271 | 730 | 2.4 |
| | **Northeast Census Region** | | | | | | | | | | | |
| | **RSE Column Factors:** | 1.2 | 1.3 | 1.1 | 1.8 | 1.1 | 1.8 | 0.7 | 0.8 | 1.1 | 0.3 | |
| 311 | Food | 92 | 22 | 5 | W | 56 | W | 2 | 0 | W | 0 | 20.1 |
| 311221 | Wet Corn Milling | * | W | * | * | 0 | 0 | 0 | 0 | * | 0 | 0.8 |
| 31131 | Sugar | W | W | * | * | W | * | 0 | 0 | * | 0 | 0.8 |
| 311421 | Fruit and Vegetable Canning | W | 1 | Q | * | 3 | W | 0 | 0 | * | 0 | 9.3 |
| 312 | Beverage and Tobacco Products | 13 | 3 | 1 | * | 7 | * | 0 | 0 | 1 | 0 | 4.2 |
| 3121 | Beverages | 12 | W | 1 | W | W | W | 0 | 0 | 1 | 0 | 4.6 |
| 3122 | Tobacco | 1 | W | * | W | W | W | 0 | 0 | * | 0 | 0.8 |
| 313 | Textile Mills | W | 5 | 3 | 1 | 14 | W | 0 | 0 | * | 0 | 21.7 |
| 314 | Textile Product Mills | W | 1 | W | W | 2 | W | W | 0 | W | 0 | 3.8 |
| 315 | Apparel | W | 2 | 0 | * | W | W | 0 | 0 | 0 | 0 | 23.5 |
| 316 | Leather and Allied Products | W | * | * | * | 1 | * | 0 | 0 | * | 0 | 9.6 |
| 321 | Wood Products | 22 | 4 | * | 2 | 4 | W | 0 | 0 | 11 | 0 | 10.9 |
| 321113 | Sawmills | 7 | 1 | * | 2 | * | * | 0 | 0 | 4 | 0 | 4.8 |
| 3212 | Veneer, Plywood, and Engineered Woods | 5 | 1 | * | * | 2 | * | 0 | 0 | 2 | 0 | 10 |
| 3219 | Other Wood Products | 10 | 2 | * | 1 | 2 | W | 0 | 0 | 5 | 0 | 17.1 |
| 322 | Paper | 284 | 28 | 37 | W | 73 | W | W | 0 | 127 | 0 | 3.3 |
| 322110 | Pulp Mills | W | * | W | * | W | * | 0 | 0 | 0 | 0 | 4.6 |
| 322121 | Paper Mills, except Newsprint | 218 | 10 | 25 | 1 | 48 | 1 | 15 | 0 | 118 | 0 | 2.8 |
| 322122 | Newsprint Mills | 7 | W | W | * | 0 | 0 | 0 | 0 | 0 | 0 | 0.8 |
| 322130 | Paperboard Mills | 28 | 3 | W | W | W | W | W | 0 | W | 0 | 2.4 |
| 323 | Printing and Related Support | W | 11 | W | * | 12 | W | 0 | 0 | W | 0 | 13.3 |
| 324 | Petroleum and Coal Products | 527 | 11 | 4 | W | 44 | W | W | 1 | 429 | 5 | 3.4 |
| 324110 | Petroleum Refineries | 477 | 9 | 3 | 1 | 36 | 1 | * | 0 | 427 | 0 | 1.4 |
| 324199 | Other Petroleum and Coal Products | W | * | * | * | W | * | W | 1 | * | 5 | 1 |
| 325 | Chemicals | 182 | 42 | W | W | 73 | W | W | 0 | W | * | 4.5 |

**Table 1.2 First Use of Energy for All Purposes (Fuel and Nonfuel), 2002;**
**Level: National and Regional Data;**
**Row: NAICS Codes; Column: Energy Sources and Shipments;**
**Unit: Trillion Btu.**

| NAICS Code(a) | Subsector and Industry | Total(b) | Net Electricity(c) | Residual Fuel Oil | Distillate Fuel Oil(d) | Natural Gas(e) | LPG and NGL(f) | Coal | Coke and Breeze | Other(g) | Shipments of Energy Sources Produced Onsite(h) | RSE Row Factors |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 325110 | Petrochemicals | W | * | 0 | * | * | 0 | 0 | 0 | * | 0 | 1.5 |
| 325120 | Industrial Gases | W | 7 | 0 | * | W | 0 | 0 | 0 | W | 0 | 0.8 |
| 325181 | Alkalies and Chlorine | W | W | * | * | * | W | 0 | 0 | W | 0 | 0.8 |
| 325182 | Carbon Black | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 325188 | Other Basic Inorganic Chemicals | W | 3 | W | 1 | 6 | W | 0 | 0 | W | 0 | 2.5 |
| 325192 | Cyclic Crudes and Intermediates | 6 | 1 | W | W | 4 | * | 0 | 0 | W | 0 | 0.8 |
| 325193 | Ethyl Alcohol | * | W | 0 | 0 | * | 0 | 0 | 0 | * | 0 | 0.9 |
| 325199 | Other Basic Organic Chemicals | W | 3 | W | * | 7 | W | 0 | 0 | W | 0 | 5.4 |
| 325211 | Plastics Materials and Resins | W | 3 | W | * | 6 | W | 0 | 0 | W | * | 6.6 |
| 325212 | Synthetic Rubber | W | * | 0 | * | * | W | 0 | 0 | W | 0 | 0.7 |
| 325222 | Noncellulosic Organic Fibers | * | W | W | 0 | * | W | 0 | 0 | * | 0 | 5 |
| 325311 | Nitrogenous Fertilizers | 2 | * | 0 | * | 1 | W | 0 | 0 | * | 0 | 0.7 |
| 325312 | Phosphatic Fertilizers | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3254 | Pharmaceuticals and Medicines | W | 10 | 1 | * | 30 | W | 0 | 0 | 2 | 0 | 6.2 |
| 325412 | Pharmaceutical Preparation | W | 7 | 1 | * | 21 | W | 0 | 0 | 1 | 0 | 8.8 |
| 325992 | Photographic Film, Paper, Plate, and Chemicals | W | W | W | * | 3 | W | W | 0 | * | 0 | 3.8 |
| 326 | Plastics and Rubber Products | 46 | 26 | 2 | W | 14 | W | W | 0 | W | 0 | 7.5 |
| 327 | Nonmetallic Mineral Products | 151 | 22 | W | W | 63 | W | 42 | 1 | 18 | 0 | 4.5 |
| 3272 | Glass and Glass Products | 40 | 7 | W | W | 30 | W | * | 0 | W | 0 | 2.7 |
| 327211 | Flat Glass | 11 | 1 | 0 | W | 9 | * | * | 0 | W | 0 | 0.8 |
| 327213 | Glass Containers | 13 | 3 | 0 | * | 10 | * | 0 | 0 | * | 0 | 0.7 |
| 327310 | Cements | 56 | 6 | W | W | * | * | W | 1 | 14 | 0 | 0.9 |
| 327410 | Lime | W | W | 0 | * | * | W | W | 0 | 1 | 0 | 0.8 |
| 327993 | Mineral Wool | W | 1 | 0 | * | 3 | * | 0 | * | * | 0 | 2.4 |
| 331 | Primary Metals | W | 51 | * | W | W | 1 | W | 12 | W | 114 | 5.4 |
| 331111 | Iron and Steel Mills | W | 21 | 0 | W | W | W | W | * | W | 114 | 3.4 |
| 331112 | Electrometallurgical Ferroalloy Products | W | W | 0 | W | W | * | W | 0 | W | 0 | 0.8 |
| 3312 | Steel Products from Purchased Steel | W | W | * | W | W | W | * | * | W | 0 | 13.4 |
| 3313 | Alumina and Aluminum | W | W | * | W | W | * | 0 | 0 | W | 0 | 1 |
| 331312 | Primary Aluminum | W | W | * | * | W | * | 0 | 0 | W | 0 | 0.8 |
| 3314 | Nonferrous Metals, except Aluminum | W | 6 | * | W | W | * | 7 | 3 | W | 0 | 3.6 |
| 3315 | Foundries | W | 4 | * | * | 7 | * | * | Q | * | 0 | 3.7 |
| 331511 | Iron Foundries | W | 2 | 0 | * | 3 | * | * | Q | * | 0 | 4.6 |
| 331521 | Aluminum Die-Casting Foundries | 1 | * | 0 | * | * | * | 0 | 0 | * | 0 | 2.9 |
| 331524 | Aluminum Foundries, except Die-Casting | 3 | 1 | * | * | 2 | * | 0 | 0 | * | 0 | 1.3 |
| 332 | Fabricated Metal Products | 55 | 22 | W | W | 29 | W | W | * | W | 0 | 16 |
| 333 | Machinery | W | 13 | * | * | 12 | W | 0 | 0 | W | 0 | 14.1 |
| 334 | Computer and Electronic Products | 62 | 38 | 1 | 1 | 21 | * | * | 0 | 1 | 0 | 26.1 |
| 334413 | Semiconductors and Related Devices | 14 | 8 | * | * | 5 | * | 0 | 0 | 1 | 0 | 3.1 |
| 335 | Electrical Equip., Appliances, and Components | W | 7 | * | * | 10 | W | 0 | 0 | * | 0 | 13.4 |
| 336 | Transportation Equipment | 49 | 14 | 4 | * | 20 | * | 0 | 0 | 11 | 0 | 4.8 |
| 336112 | Light Trucks and Utility Vehicles | 2 | W | 0 | W | W | * | 0 | 0 | W | 0 | 0.7 |
| 337 | Furniture and Related Products | W | 3 | 0 | W | 3 | W | 0 | 0 | W | 0 | 10.5 |
| 339 | Miscellaneous | W | 9 | * | 1 | 10 | W | 0 | 0 | W | 0 | 11.4 |
| | Total | 1,874 | 334 | 68 | 30 | 541 | 27 | 329 | 14 | 651 | 119 | 3.6 |
| | **Midwest Census Region** | | | | | | | | | | | |
| | **RSE Column Factors:** | 1.2 | 1.1 | 1.1 | 1.4 | 1.3 | 1.8 | 0.5 | 0.8 | 1.2 | 0.4 | |
| 311 | Food | 538 | 97 | 4 | 2 | 252 | 1 | 159 | 1 | 23 | 0 | 9.6 |
| 311221 | Wet Corn Milling | 191 | 20 | * | * | 52 | * | 113 | 0 | 6 | 0 | 0.9 |

**Table 1.2 First Use of Energy for All Purposes (Fuel and Nonfuel), 2002;**
**Level: National and Regional Data;**
**Row: NAICS Codes; Column: Energy Sources and Shipments;**
**Unit: Trillion Btu.**

| NAICS Code(a) | Subsector and Industry | Total(b) | Net Electricity(c) | Residual Fuel Oil | Distillate Fuel Oil(d) | Natural Gas(e) | LPG and NGL(f) | Coal | Coke and Breeze | Other(g) | Shipments of Energy Sources Produced Onsite(h) | RSE Row Factors |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31131 | Sugar | 30 | 1 | 1 | * | 5 | * | 21 | 1 | * | 0 | 0.9 |
| 311421 | Fruit and Vegetable Canning | 7 | 1 | * | * | 5 | * | 0 | 0 | * | 0 | 2.9 |
| 312 | Beverage and Tobacco Products | 23 | 5 | * | Q | 10 | * | 6 | 0 | 1 | 0 | 4.1 |
| 3121 | Beverages | 22 | W | * | W | W | W | 6 | 0 | 1 | 0 | 4.1 |
| 3122 | Tobacco | 1 | W | 0 | W | W | W | 0 | 0 | 1 | 0 | 0.8 |
| 313 | Textile Mills | W | 1 | 0 | * | 1 | W | 0 | 0 | * | 0 | 6.3 |
| 314 | Textile Product Mills | W | 1 | 0 | 0 | 1 | W | 0 | 0 | W | 0 | 9.1 |
| 315 | Apparel | W | 1 | 0 | 0 | 1 | * | 0 | 0 | * | 0 | 12.9 |
| 316 | Leather and Allied Products | 4 | 1 | 0 | * | 3 | * | 0 | 0 | * | 0 | 12.8 |
| 321 | Wood Products | 47 | 10 | W | W | 13 | 1 | W | 0 | 20 | 0 | 4.8 |
| 321113 | Sawmills | 6 | 1 | * | * | 1 | * | 0 | 0 | 3 | 0 | 6.6 |
| 3212 | Veneer, Plywood, and Engineered Woods | 23 | 4 | W | W | 6 | 1 | W | 0 | 11 | 0 | 3.2 |
| 3219 | Other Wood Products | 17 | 5 | 0 | * | 5 | * | 0 | 0 | Q | 0 | 11.4 |
| 322 | Paper | 338 | 51 | 7 | 1 | 100 | Q | 81 | 4 | 93 | 0 | 3 |
| 322110 | Pulp Mills | W | * | 0 | W | W | * | W | 0 | W | 0 | 0.9 |
| 322121 | Paper Mills, except Newsprint | 212 | 28 | 5 | 1 | 52 | * | 63 | 4 | 60 | 0 | 2.1 |
| 322122 | Newsprint Mills | 4 | W | 0 | * | W | * | W | 0 | W | 0 | 0.9 |
| 322130 | Paperboard Mills | 62 | 8 | W | W | W | W | W | 0 | W | 0 | 5.6 |
| 323 | Printing and Related Support | 34 | 18 | 0 | * | 15 | * | 0 | 0 | 1 | 0 | 12.9 |
| 324 | Petroleum and Coal Products | 888 | 23 | 9 | 3 | 102 | 6 | 0 | 0 | 762 | 17 | 4.2 |
| 324110 | Petroleum Refineries | 858 | 21 | 8 | 1 | 84 | 5 | 0 | 0 | 740 | 0 | 2.3 |
| 324199 | Other Petroleum and Coal Products | W | * | 0 | * | 1 | * | 0 | 0 | 20 | 15 | 0.9 |
| 325 | Chemicals | 664 | 100 | W | W | 247 | W | 69 | Q | W | 16 | 4.8 |
| 325110 | Petrochemicals | W | W | 0 | * | 2 | W | 0 | 0 | * | W | 0.9 |
| 325120 | Industrial Gases | W | 21 | 0 | 0 | W | 0 | 0 | 0 | W | 0 | 1.2 |
| 325181 | Alkalies and Chlorine | W | W | 0 | * | 1 | W | W | 0 | * | 0 | 4 |
| 325182 | Carbon Black | W | * | W | 0 | W | * | 0 | 0 | * | 0 | 0.8 |
| 325188 | Other Basic Inorganic Chemicals | 45 | 7 | W | * | W | W | W | * | 6 | * | 2 |
| 325192 | Cyclic Crudes and Intermediates | W | W | W | * | 6 | * | 0 | 0 | * | 0 | 0.8 |
| 325193 | Ethyl Alcohol | 58 | 4 | 0 | * | 28 | * | 19 | 0 | W | W | 4.7 |
| 325199 | Other Basic Organic Chemicals | 75 | 14 | 0 | * | 20 | W | W | 0 | W | W | 2.6 |
| 325211 | Plastics Materials and Resins | W | 15 | W | * | 20 | W | W | * | W | W | 2.4 |
| 325212 | Synthetic Rubber | W | 1 | 0 | * | 1 | W | W | 0 | W | 0 | 1.6 |
| 325222 | Noncellulosic Organic Fibers | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 325311 | Nitrogenous Fertilizers | 88 | 4 | 0 | * | 83 | 0 | 0 | 0 | 1 | 0 | 0.8 |
| 325312 | Phosphatic Fertilizers | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3254 | Pharmaceuticals and Medicines | W | 14 | * | 2 | 18 | W | 9 | 0 | 1 | 0 | 6.2 |
| 325412 | Pharmaceutical Preparation | W | 12 | * | * | 13 | W | 9 | 0 | * | 0 | 2.4 |
| 325992 | Photographic Film, Paper, Plate, and Chemicals | W | W | 0 | 0 | * | W | 0 | 0 | 0 | 0 | 3.3 |
| 326 | Plastics and Rubber Products | 140 | 67 | 1 | * | 48 | W | W | 0 | W | 0 | 13.2 |
| 327 | Nonmetallic Mineral Products | 304 | 36 | W | 9 | 112 | W | 85 | 2 | 59 | 0 | 4.7 |
| 3272 | Glass and Glass Products | 58 | 12 | 0 | W | 44 | W | 0 | 0 | W | 0 | 1.4 |
| 327211 | Flat Glass | 19 | 2 | 0 | W | 16 | * | 0 | 0 | W | 0 | 0.8 |
| 327213 | Glass Containers | 16 | 3 | 0 | * | 13 | * | 0 | 0 | * | 0 | 0.8 |
| 327310 | Cements | 117 | 10 | 0 | 1 | 6 | * | 55 | * | 45 | 0 | 3.3 |
| 327410 | Lime | 48 | 2 | W | * | 4 | W | 30 | * | 12 | 0 | 0.9 |
| 327993 | Mineral Wool | 20 | 5 | 0 | * | 14 | * | 0 | 1 | * | 0 | 1.2 |
| 331 | Primary Metals | 1,085 | 189 | * | 8 | 363 | 1 | 246 | 246 | 58 | 27 | 1.9 |
| 331111 | Iron and Steel Mills | 799 | 77 | * | W | 251 | W | 242 | 230 | W | 27 | 2 |
| 331112 | Electrometallurgical Ferroalloy Products | W | 8 | 0 | W | 7 | * | 2 | * | W | 0 | 0.9 |
| 3312 | Steel Products from Purchased Steel | W | 7 | 0 | W | 14 | W | * | 0 | W | 0 | 9.3 |
| 3313 | Alumina and Aluminum | W | 54 | 0 | * | 31 | * | 0 | 0 | W | 0 | 2.9 |

**Table 1.2 First Use of Energy for All Purposes (Fuel and Nonfuel), 2002;**
**Level: National and Regional Data;**
**Row: NAICS Codes; Column: Energy Sources and Shipments;**
**Unit: Trillion Btu.**

| NAICS Code(a) | Subsector and Industry | Total(b) | Net Electricity(c) | Residual Fuel Oil | Distillate Fuel Oil(d) | Natural Gas(e) | LPG and NGL(f) | Coal | Coke and Breeze | Other(g) | Shipments of Energy Sources Produced Onsite(h) | RSE Row Factors |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 331312 | Primary Aluminum | W | 47 | 0 | * | W | * | 0 | 0 | W | 0 | 0.8 |
| 3314 | Nonferrous Metals, except Aluminum | W | 9 | * | W | 13 | 1 | * | 3 | W | 0 | 4.2 |
| 3315 | Foundries | W | 33 | * | * | 47 | * | 1 | 12 | 1 | 0 | 2.5 |
| 331511 | Iron Foundries | W | 19 | 0 | * | 16 | * | 1 | 12 | 1 | 0 | 3.5 |
| 331521 | Aluminum Die-Casting Foundries | 17 | 5 | * | * | 12 | * | 0 | 0 | * | 0 | 2.8 |
| 331524 | Aluminum Foundries, except Die-Casting | 11 | 3 | 0 | * | 8 | * | 0 | 0 | * | 0 | 2.7 |
| 332 | Fabricated Metal Products | 183 | 73 | W | W | 100 | W | W | Q | W | 0 | 14.4 |
| 333 | Machinery | 92 | 39 | 0 | 2 | 47 | W | 1 | 0 | W | 0 | 11.4 |
| 334 | Computer and Electronic Products | 32 | 18 | 0 | * | 13 | * | 0 | 0 | 1 | 0 | 7 |
| 334413 | Semiconductors and Related Devices | 3 | 2 | 0 | * | 1 | * | 0 | 0 | * | 0 | 1.3 |
| 335 | Electrical Equip., Appliances, and Components | 37 | 17 | * | * | 19 | * | * | 0 | * | 0 | 7 |
| 336 | Transportation Equipment | 241 | 94 | * | W | 120 | 2 | W | Q | 15 | 0 | 11.5 |
| 336112 | Light Trucks and Utility Vehicles | 36 | 10 | * | W | 24 | * | W | 0 | W | 0 | 0.9 |
| 337 | Furniture and Related Products | 25 | 8 | 0 | W | 12 | W | W | 0 | W | 0 | 13.1 |
| 339 | Miscellaneous | 19 | 10 | * | * | 9 | * | 0 | 0 | * | 0 | 6.9 |
| | Total | 4,702 | 858 | W | W | 1,588 | 164 | 676 | 261 | 1,152 | 60 | 3.6 |
| | **South Census Region** | | | | | | | | | | | |
| | **RSE Column Factors:** | 1.1 | 1.3 | 1.1 | 1.6 | 1.2 | 1.9 | 0.8 | 0.6 | 1.1 | 0.4 | |
| 311 | Food | 323 | 78 | Q | 6 | 169 | 2 | 10 | 0 | 53 | 0 | 7.2 |
| 311221 | Wet Corn Milling | 20 | 4 | 0 | * | 5 | * | 8 | 0 | 4 | 0 | 0.8 |
| 31131 | Sugar | 57 | 1 | 1 | 1 | 10 | * | 2 | 0 | 42 | 0 | 0.8 |
| 311421 | Fruit and Vegetable Canning | 14 | 2 | * | Q | 11 | Q | 0 | 0 | * | 0 | 7.3 |
| 312 | Beverage and Tobacco Products | 45 | 12 | 1 | Q | 19 | * | 11 | 0 | 2 | 0 | 3 |
| 3121 | Beverages | 27 | 8 | * | Q | 15 | * | 1 | 0 | 2 | 0 | 3.3 |
| 3122 | Tobacco | 18 | 4 | 1 | * | 3 | * | 10 | 0 | * | 0 | 0.8 |
| 313 | Textile Mills | 169 | 77 | 1 | 1 | 53 | * | 22 | 0 | 15 | 0 | 16 |
| 314 | Textile Product Mills | 51 | 13 | W | W | 24 | W | W | 0 | W | 0 | 18.3 |
| 315 | Apparel | 15 | 7 | * | Q | 7 | * | 0 | 0 | * | 0 | 19.4 |
| 316 | Leather and Allied Products | 1 | * | 0 | * | * | * | 0 | 0 | * | 0 | 5.1 |
| 321 | Wood Products | 214 | 39 | W | W | 25 | 2 | W | 0 | 140 | 0 | 6.5 |
| 321113 | Sawmills | 69 | 11 | 0 | 2 | 3 | * | 0 | 0 | 53 | 0 | 8.3 |
| 3212 | Veneer, Plywood, and Engineered Woods | 101 | 20 | W | W | 17 | 1 | W | 0 | 60 | 0 | 7 |
| 3219 | Other Wood Products | 38 | 7 | 0 | 1 | 3 | * | 0 | 0 | 27 | 0 | 10.8 |
| 322 | Paper | 1,434 | 103 | 51 | 9 | 243 | 2 | 138 | 0 | 889 | 0 | 1.6 |
| 322110 | Pulp Mills | 194 | 4 | 10 | W | W | * | W | 0 | 156 | 0 | 0.8 |
| 322121 | Paper Mills, except Newsprint | 473 | 31 | 15 | 2 | 79 | * | 61 | 0 | 284 | 0 | 1.4 |
| 322122 | Newsprint Mills | 48 | 17 | * | * | W | * | W | 0 | W | 0 | 0.8 |
| 322130 | Paperboard Mills | 673 | 34 | 27 | W | 108 | W | W | 0 | 433 | 0 | 2.3 |
| 323 | Printing and Related Support | 28 | 15 | W | * | 11 | W | 0 | 0 | * | 0 | 6.7 |
| 324 | Petroleum and Coal Products | 4,304 | 76 | 8 | W | 563 | 7 | W | 1 | 3,446 | 59 | 4.5 |
| 324110 | Petroleum Refineries | 4,012 | 73 | 5 | 2 | 544 | 6 | 0 | 0 | 3,382 | 0 | 1.7 |
| 324199 | Other Petroleum and Coal Products | Q | * | 0 | * | W | * | W | 1 | 63 | 59 | 2.4 |
| 325 | Chemicals | 5,417 | 341 | W | W | 1,865 | 2,839 | W | 1 | 544 | 488 | 4 |
| 325110 | Petrochemicals | W | W | W | * | 207 | W | W | 0 | 80 | W | 0.9 |
| 325120 | Industrial Gases | 103 | 37 | 0 | * | W | W | 0 | 0 | W | 0 | 4.1 |
| 325181 | Alkalies and Chlorine | W | 30 | 0 | * | W | W | W | 0 | W | W | 0.9 |
| 325182 | Carbon Black | W | 2 | W | * | W | * | 0 | 0 | W | 0 | 0.8 |
| 325188 | Other Basic Inorganic Chemicals | 116 | 68 | W | 1 | 38 | W | W | 0 | W | 0 | 2.5 |
| 325192 | Cyclic Crudes and Intermediates | 85 | 10 | W | W | 32 | 19 | * | 0 | 24 | 0 | 0.8 |

**Table 1.2 First Use of Energy for All Purposes (Fuel and Nonfuel), 2002;**
**Level: National and Regional Data;**
**Row: NAICS Codes; Column: Energy Sources and Shipments;**
**Unit: Trillion Btu.**

| NAICS Code(a) | Subsector and Industry | Total(b) | Net Electricity(c) | Residual Fuel Oil | Distillate Fuel Oil(d) | Natural Gas(e) | LPG and NGL(f) | Coal | Coke and Breeze | Other(g) | Shipments of Energy Sources Produced Onsite(h) | RSE Row Factors |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 325193 | Ethyl Alcohol | * | W | 0 | * | * | * | 0 | 0 | * | 0 | 0.8 |
| 325199 | Other Basic Organic Chemicals | 1,734 | 61 | 12 | 1 | 557 | 718 | W | 0 | 328 | W | 6.7 |
| 325211 | Plastics Materials and Resins | 1,626 | 54 | W | 1 | 387 | 1,149 | W | 0 | 43 | W | 2.8 |
| 325212 | Synthetic Rubber | 51 | 5 | * | * | 27 | W | W | 0 | W | * | 4.6 |
| 325222 | Noncellulosic Organic Fibers | 63 | 14 | W | * | 31 | W | W | 0 | 5 | 0 | 0.8 |
| 325311 | Nitrogenous Fertilizers | 342 | 6 | 0 | * | 335 | * | 0 | 0 | * | 0 | 0.8 |
| 325312 | Phosphatic Fertilizers | 30 | 2 | 1 | 1 | 25 | * | 1 | 1 | * | 0 | 0.9 |
| 3254 | Pharmaceuticals and Medicines | W | 9 | 1 | * | 9 | * | 0 | 0 | 4 | 0 | 7.5 |
| 325412 | Pharmaceutical Preparation | 14 | 6 | 1 | * | 4 | * | 0 | 0 | 3 | 0 | 10.8 |
| 325992 | Photographic Film, Paper, Plate, and Chemicals | 5 | 3 | W | * | 2 | W | 0 | 0 | * | 0 | 3.7 |
| 326 | Plastics and Rubber Products | 141 | 73 | 5 | W | 57 | W | 0 | 0 | W | 0 | 11.9 |
| 327 | Nonmetallic Mineral Products | 424 | 61 | W | 10 | 185 | W | 116 | 8 | 44 | 0 | 5.1 |
| 3272 | Glass and Glass Products | 80 | 17 | W | W | 61 | W | * | 0 | 1 | 0 | 1.9 |
| 327211 | Flat Glass | 25 | 3 | W | W | 21 | * | * | 0 | 1 | 0 | 0.8 |
| 327213 | Glass Containers | 22 | 4 | 0 | * | 18 | * | 0 | 0 | * | 0 | 0.8 |
| 327310 | Cements | 149 | 17 | 0 | 2 | 10 | * | 89 | 7 | 24 | 0 | 3.4 |
| 327410 | Lime | 39 | 2 | 0 | * | 3 | * | 23 | 0 | 11 | 0 | 0.8 |
| 327993 | Mineral Wool | 22 | 5 | 0 | * | 16 | * | 0 | 1 | * | 0 | 3.3 |
| 331 | Primary Metals | 668 | 206 | * | W | 234 | 1 | W | 96 | 81 | 2 | 1.8 |
| 331111 | Iron and Steel Mills | 319 | 74 | * | W | 110 | * | W | 89 | W | 2 | 1.7 |
| 331112 | Electrometallurgical Ferroalloy Products | W | W | 0 | * | W | * | W | * | W | 0 | 11.3 |
| 3312 | Steel Products from Purchased Steel | 11 | W | 0 | W | W | * | * | 0 | W | 0 | 10.9 |
| 3313 | Alumina and Aluminum | W | 99 | 0 | W | 85 | * | * | * | W | 0 | 2.1 |
| 331312 | Primary Aluminum | 172 | 85 | 0 | * | W | * | * | 0 | W | 0 | 0.8 |
| 3314 | Nonferrous Metals, except Aluminum | W | 11 | 0 | * | 14 | * | 1 | Q | 1 | 0 | 4.4 |
| 3315 | Foundries | 40 | 14 | 0 | * | 18 | * | 1 | 6 | * | 0 | 1.3 |
| 331511 | Iron Foundries | 20 | 6 | 0 | * | 8 | * | * | 6 | * | 0 | 1.5 |
| 331521 | Aluminum Die-Casting Foundries | 4 | 1 | 0 | * | 3 | * | 0 | 0 | * | 0 | 1.5 |
| 331524 | Aluminum Foundries, except Die-Casting | 4 | 1 | 0 | * | 3 | * | 0 | 0 | * | 0 | 3.1 |
| 332 | Fabricated Metal Products | 121 | 52 | W | W | 66 | 2 | W | 0 | Q | 0 | 13.1 |
| 333 | Machinery | 43 | 25 | 0 | * | 17 | W | 0 | 0 | Q | 0 | 8.9 |
| 334 | Computer and Electronic Products | 40 | 31 | 0 | * | 8 | * | 0 | 0 | * | 0 | 6.7 |
| 334413 | Semiconductors and Related Devices | 16 | 12 | 0 | * | 3 | * | 0 | 0 | * | 0 | 2.7 |
| 335 | Electrical Equip., Appliances, and Components | 109 | 21 | * | * | 18 | 1 | * | * | 69 | 0 | 8.8 |
| 336 | Transportation Equipment | 102 | 48 | 2 | W | 44 | 1 | W | 0 | 4 | 0 | 4.8 |
| 336112 | Light Trucks and Utility Vehicles | 19 | W | 0 | W | W | * | 0 | 0 | W | 0 | 0.8 |
| 337 | Furniture and Related Products | 25 | 11 | 0 | W | 8 | 1 | W | 0 | 5 | 0 | 16.1 |
| 339 | Miscellaneous | 19 | 10 | * | * | 8 | * | 0 | 0 | * | 0 | 13.1 |
| | Total | 13,692 | 1,300 | W | W | 3,625 | 2,862 | 845 | 105 | 5,297 | 549 | 2.7 |
| | **West Census Region** | | | | | | | | | | | |
| | **RSE Column Factors:** | 1.3 | 1.4 | 0.7 | 1.6 | 1.4 | 2 | 0.7 | 0.5 | 1.1 | 0.4 | |
| 311 | Food | 171 | 34 | * | W | 105 | W | 13 | * | W | 0 | 6.8 |
| 311221 | Wet Corn Milling | 5 | W | 0 | * | 4 | * | 0 | 0 | 1 | 0 | 3.2 |
| 31131 | Sugar | W | W | * | * | W | * | 13 | * | 3 | 0 | 0.9 |
| 311421 | Fruit and Vegetable Canning | W | 2 | * | * | 17 | W | 0 | 0 | * | 0 | 6.3 |
| 312 | Beverage and Tobacco Products | 23 | 6 | 0 | * | 10 | * | 0 | 0 | 7 | 0 | 3.5 |
| 3121 | Beverages | 23 | 6 | 0 | * | 10 | * | 0 | 0 | 7 | 0 | 3.5 |
| 3122 | Tobacco | * | * | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.7 |
| 313 | Textile Mills | W | 3 | 0 | 0 | Q | W | 0 | 0 | 1 | 0 | 8.5 |

**Table 1.2 First Use of Energy for All Purposes (Fuel and Nonfuel), 2002;**
**Level: National and Regional Data;**
**Row: NAICS Codes; Column: Energy Sources and Shipments;**
**Unit: Trillion Btu.**

| NAICS Code(a) | Subsector and Industry | Total(b) | Net Electricity(c) | Residual Fuel Oil | Distillate Fuel Oil(d) | Natural Gas(e) | LPG and NGL(f) | Coal | Coke and Breeze | Other(g) | Shipments of Energy Sources Produced Onsite(h) | RSE Row Factors |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 314 | Textile Product Mills | W | 1 | 0 | 0 | 1 | W | 0 | 0 | 0 | 0 | 15.6 |
| 315 | Apparel | W | 3 | 0 | * | W | W | 0 | 0 | * | 0 | 25.6 |
| 316 | Leather and Allied Products | W | * | 0 | * | * | 0 | 0 | 0 | 0 | 0 | 25.9 |
| 321 | Wood Products | 94 | 17 | 1 | 3 | 15 | W | 0 | 0 | 56 | 0 | 5.4 |
| 321113 | Sawmills | 46 | 6 | * | 2 | 6 | * | 0 | 0 | 32 | 0 | 6 |
| 3212 | Veneer, Plywood, and Engineered Woods | 38 | 8 | 0 | * | 7 | * | 0 | 0 | 22 | 0 | 4.5 |
| 3219 | Other Wood Products | 8 | 3 | 0 | * | 2 | W | 0 | 0 | Q | 0 | 10.7 |
| 322 | Paper | 307 | 42 | 5 | W | 88 | W | W | 0 | 168 | 0 | 1.3 |
| 322110 | Pulp Mills | W | 1 | W | W | W | * | 0 | 0 | W | 0 | 0.8 |
| 322121 | Paper Mills, except Newsprint | 99 | 9 | 3 | * | 27 | * | 0 | 0 | 60 | 0 | 1.7 |
| 322122 | Newsprint Mills | 34 | 16 | W | * | W | * | 0 | 0 | W | 0 | 0.8 |
| 322130 | Paperboard Mills | 145 | 11 | W | W | 43 | W | W | 0 | 87 | 0 | 0.9 |
| 323 | Printing and Related Support | W | 6 | 0 | * | 8 | W | 0 | 0 | W | 0 | 15.3 |
| 324 | Petroleum and Coal Products | 1,080 | 17 | 5 | W | 168 | W | 0 | 0 | 882 | 3 | 6.2 |
| 324110 | Petroleum Refineries | 1,044 | 19 | 5 | 1 | 157 | 8 | 0 | 0 | 855 | 0 | 5.3 |
| 324199 | Other Petroleum and Coal Products | 23 | -2 | 0 | * | 2 | 0 | 0 | 0 | 26 | 3 | 0.9 |
| 325 | Chemicals | 202 | 40 | W | W | 122 | W | W | 2 | W | 0 | 3.3 |
| 325110 | Petrochemicals | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 325120 | Industrial Gases | W | W | 0 | 0 | W | * | 0 | 0 | 0 | 0 | 1 |
| 325181 | Alkalies and Chlorine | 31 | 6 | 0 | * | W | * | W | 0 | W | 0 | 0.8 |
| 325182 | Carbon Black | * | * | W | 0 | * | * | 0 | 0 | W | 0 | 0.8 |
| 325188 | Other Basic Inorganic Chemicals | W | 10 | W | * | W | W | W | 2 | W | 0 | 1.4 |
| 325192 | Cyclic Crudes and Intermediates | W | W | 0 | * | * | * | 0 | 0 | W | 0 | 0.7 |
| 325193 | Ethyl Alcohol | 2 | * | 0 | * | 1 | * | 0 | 0 | W | 0 | 0.7 |
| 325199 | Other Basic Organic Chemicals | W | 1 | W | * | 3 | * | 0 | 0 | W | 0 | 5.3 |
| 325211 | Plastics Materials and Resins | W | 1 | 0 | * | 1 | W | 0 | 0 | * | 0 | 2.6 |
| 325212 | Synthetic Rubber | * | * | 0 | 0 | * | * | 0 | 0 | * | 0 | 0.7 |
| 325222 | Noncellulosic Organic Fibers | * | * | 0 | 0 | 0 | * | 0 | 0 | 0 | 0 | 0.6 |
| 325311 | Nitrogenous Fertilizers | 66 | 2 | 0 | * | 65 | W | * | 0 | * | 0 | 0.8 |
| 325312 | Phosphatic Fertilizers | 8 | 2 | 0 | * | 6 | * | 0 | 0 | * | 0 | 0.7 |
| 3254 | Pharmaceuticals and Medicines | 9 | 4 | 0 | * | 5 | W | 0 | 0 | * | 0 | 3.6 |
| 325412 | Pharmaceutical Preparation | 5 | 2 | 0 | * | 3 | * | 0 | 0 | * | 0 | 3.7 |
| 325992 | Photographic Film, Paper, Plate, and Chemicals | 3 | W | 0 | * | 2 | W | 0 | 0 | 0 | 0 | 0.6 |
| 326 | Plastics and Rubber Products | 24 | 15 | 0 | * | 9 | W | 0 | 0 | W | 0 | 11.8 |
| 327 | Nonmetallic Mineral Products | 180 | 22 | W | W | 62 | W | 67 | * | 15 | 0 | 3.2 |
| 3272 | Glass and Glass Products | 24 | 5 | W | W | 17 | * | 0 | 0 | W | 0 | 0.9 |
| 327211 | Flat Glass | 8 | 1 | W | W | 5 | * | 0 | 0 | W | 0 | 0.8 |
| 327213 | Glass Containers | 14 | 3 | 0 | * | 11 | * | 0 | 0 | * | 0 | 0.7 |
| 327310 | Cements | 87 | 9 | W | W | 5 | * | W | * | 12 | 0 | 1.2 |
| 327410 | Lime | W | W | W | * | 1 | * | W | 0 | 2 | 0 | 0.8 |
| 327993 | Mineral Wool | W | 2 | 0 | * | 3 | * | 0 | * | * | 0 | 1 |
| 331 | Primary Metals | W | 46 | 0 | 2 | W | * | W | 1 | W | 0 | 1.6 |
| 331111 | Iron and Steel Mills | W | 13 | 0 | * | W | * | W | * | W | 0 | 2.6 |
| 331112 | Electrometallurgical Ferroalloy Products | W | W | 0 | * | * | * | 0 | 0 | W | 0 | 0.7 |
| 3312 | Steel Products from Purchased Steel | W | W | 0 | * | W | * | 0 | 0 | W | 0 | 2.3 |
| 3313 | Alumina and Aluminum | W | W | 0 | * | W | * | 0 | 0 | W | 0 | 1.9 |
| 331312 | Primary Aluminum | W | W | 0 | * | 2 | * | 0 | 0 | W | 0 | 0.8 |
| 3314 | Nonferrous Metals, except Aluminum | W | 8 | 0 | 2 | W | * | 0 | * | W | 0 | 3.4 |
| 3315 | Foundries | W | 2 | 0 | * | 4 | * | * | 1 | * | 0 | 2 |
| 331511 | Iron Foundries | W | 1 | 0 | * | 1 | * | * | 1 | * | 0 | 0.9 |
| 331521 | Aluminum Die-Casting Foundries | 1 | * | 0 | 0 | * | * | 0 | 0 | * | 0 | 10.8 |
| 331524 | Aluminum Foundries, except Die-Casting | 1 | * | 0 | * | 1 | * | 0 | 0 | * | 0 | 1.9 |

**Table 1.2 First Use of Energy for All Purposes (Fuel and Nonfuel), 2002;**
**Level: National and Regional Data;**
**Row: NAICS Codes; Column: Energy Sources and Shipments;**
**Unit: Trillion Btu.**

| NAICS Code(a) | Subsector and Industry | Total(b) | Net Electricity(c) | Residual Fuel Oil | Distillate Fuel Oil(d) | Natural Gas(e) | LPG and NGL(f) | Coal | Coke and Breeze | Other(g) | Shipments of Energy Sources Produced Onsite(h) | RSE Row Factors |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 332 | Fabricated Metal Products | 30 | 14 | 0 | * | 15 | W | 0 | 0 | W | 0 | 10.6 |
| 333 | Machinery | W | 7 | 0 | * | 6 | * | 0 | 0 | W | 0 | 10.8 |
| 334 | Computer and Electronic Products | 68 | 43 | * | * | 24 | * | 0 | 0 | 1 | 0 | 7.3 |
| 334413 | Semiconductors and Related Devices | 34 | 22 | 0 | * | 12 | * | 0 | 0 | * | 0 | 6.1 |
| 335 | Electrical Equip., Appliances, and Components | W | 3 | 0 | * | Q | W | 0 | 0 | * | 0 | 5 |
| 336 | Transportation Equipment | 36 | 16 | 0 | * | 18 | * | 0 | 0 | 1 | 0 | 11.3 |
| 336112 | Light Trucks and Utility Vehicles | * | W | 0 | * | * | * | 0 | 0 | * | 0 | 0.7 |
| 337 | Furniture and Related Products | W | 3 | * | * | 2 | W | 0 | 0 | W | 0 | 12.5 |
| 339 | Miscellaneous | W | 7 | 0 | * | 5 | W | 0 | 0 | W | 0 | 16.5 |
| | Total | 2,398 | 347 | 13 | 30 | 715 | 17 | 106 | 4 | 1,170 | 3 | 2.9 |

(a) The Bureau of the Census classifies establishments using the North American Industry Classification System (NAICS).

(b) 'Total' is the sum of all of the listed energy sources, including 'Other,' minus the shipments of energy sources produced onsite. It is the total amount of first use of energy for all (fuel and nonfuel) purposes.

(c) 'Net Electricity' is obtained by summing purchases, transfers in, and generation from noncombustible renewable resources, minus quantities sold and transferred out. It does not include electricity inputs from onsite cogeneration or generation from combustible fuels because that energy has already been included as generating fuel (for example, coal).

(d) 'Distillate Fuel Oil' includes Nos. 1, 2, and 4 fuel oils and Nos. 1, 2, and 4 diesel fuels.

(e) 'Natural Gas' includes natural gas obtained from utilities, local distribution companies, and any other supplier(s), such as independent gas producers, gas brokers, marketers, and any marketing subsidiaries of utilities.

(f) Examples of Liquefied Petroleum Gases '(LPG)' are ethane, ethylene, propane, propylene, normal butane, butylene, ethane-propane mixtures, propane-butane mixtures, and isobutane produced at refineries or natural gas processing plants, including plants that fractionate raw Natural Gas Liquids '(NGL).'

(g) 'Other' includes net steam (the sum of purchases, generation from renewables, and net transfers), and other energy that respondents indicated was used to produce heat and power or as feedstock/raw material inputs. See also Footnote 'i'.

(h) 'Shipments of Energy Sources Produced Onsite' are those shipments produced or transformed onsite from the nonfuel use of other energy sources. For example, at an establishment that processes coal to make coke for later use, the entire quantity of coal is counted as first use. Any onsite consumption of coke is not counted as first use because it would duplicate the coal use. If some of the coke is then sold to another establishment, then that second establishment will consider this coke to be a shipment of an offsite-produced energy source. Hence, the second establishment will count this coke as its first use, thereby resulting in double counting. In order to eliminate the double counting, the energy equivalent of the coke shipment must be subtracted from first use.

(i) For the petroleum refining industry only, the feedstocks and raw material inputs for the production of nonenergy products (i.e., asphalt, waxes, lubricants, and solvents) and feedstock consumption at adjoining petrochemical plants are included in the 'Other' column, regardless of type of energy. The remaining columns for the petroleum refining industry include only energy that was consumed for the production of heat and power. The 'Other' column also includes net steam and other energy that respondents indicated was used in the production of heat and power. Those inputs and feedstocks that were converted

**Table 1.2 First Use of Energy for All Purposes (Fuel and Nonfuel), 2002;**
**Level: National and Regional Data;**
**Row: NAICS Codes; Column: Energy Sources and Shipments;**
**Unit: Trillion Btu.**

| NAICS Code(a) | Subsector and Industry | Total(b) | Net Electricity(c) | Residual Fuel Oil | Distillate Fuel Oil(d) | Natural Gas(e) | LPG and NGL(f) | Coal | Coke and Breeze | Other(g) | Shipments of Energy Sources Produced Onsite(h) | RSE Row Factors |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

to other energy products (e.g., crude oil converted to residual and distillate fuel oils) are excluded.

NF=No applicable RSE row/column factor.

* Estimate less than 0.5.

W=Withheld to avoid disclosing data for individual establishments.

Q=Withheld because Relative Standard Error is greater than 50 percent.

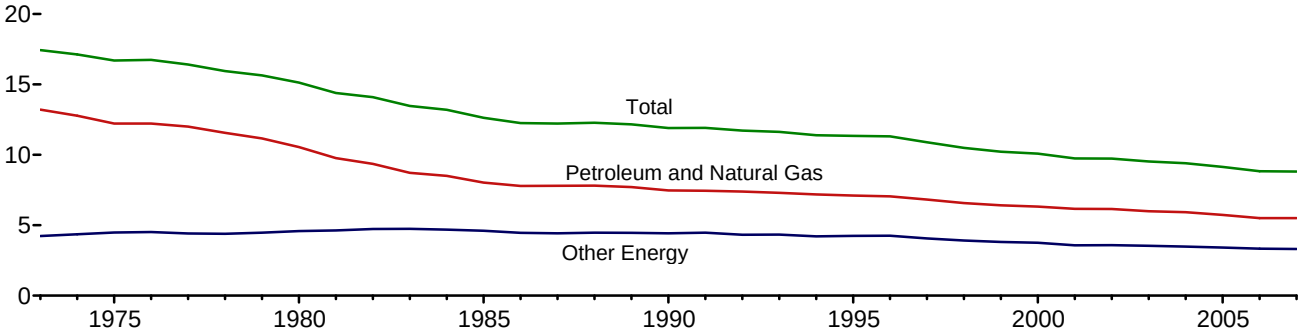
NA=Not available.

Notes: To obtain the RSE percentage for any table cell, multiply the cell's corresponding RSE column and RSE row factors. Totals may not equal sum of components because of independent rounding. The derived estimates presented in this table are for the first use (formerly primary consumption) of energy for heat and power and as feedstocks or raw material inputs. First use is defined as the consumption of the energy that was originally produced offsite or was produced onsite from input materials not classified as energy. Examples of the latter are hydrogen produced from the electrolysis of brine; the output of captive (onsite) mines or wells; woodchips, bark, and woodwaste from wood purchased as a raw material input; and waste materials, such as wastepaper and packing materials. First use excludes quantities of energy that are produced from other energy inputs and, therefore, avoids double counting.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy Consumption Division, Form EIA-846, '2002 Manufacturing Energy Consumption Survey,' and Office of Oil and Gas, Petroleum Supply Division, Form EIA-810, 'Monthly Refinery Report' for 2002.

## Figure 1.7 Energy Consumption per Real Dollar of Gross Domestic Product, 1973-2007

(Thousand Btu per Chained (2000) Dollar)




Web Page: http://www.eia.doe.gov/emeu/mer/overview.html.
Source: Table 1.7.

## Table 1.7 Energy Consumption per Real Dollar of Gross Domestic Product

| | Energy Consumption | | | Gross Domestic Product (GDP) | Energy Consumption per Real Dollar of GDP | | |
|---|---|---|---|---|---|---|---|
| | Petroleum and Natural Gas | Other Energy[a] | Total | | Petroleum and Natural Gas | Other Energy[a] | Total |
| | Quadrillion Btu | | | Billion Chained (2000) Dollars | Thousand Btu per Chained (2000) Dollar | | |
| 1973 Year | 57.352 | 18.356 | 75.708 | 4,341.5 | 13.21 | 4.23 | 17.44 |
| 1974 Year | 55.187 | 18.804 | 73.991 | 4,319.6 | 12.78 | 4.35 | 17.13 |
| 1975 Year | 52.678 | 19.321 | 71.999 | 4,311.2 | 12.22 | 4.48 | 16.70 |
| 1976 Year | 55.520 | 20.492 | 76.012 | 4,540.9 | 12.23 | 4.51 | 16.74 |
| 1977 Year | 57.053 | 20.947 | 78.000 | 4,750.5 | 12.01 | 4.41 | 16.42 |
| 1978 Year | 57.966 | 22.021 | 79.986 | 5,015.0 | 11.56 | 4.39 | 15.95 |
| 1979 Year | 57.789 | 23.114 | 80.903 | 5,173.4 | 11.17 | 4.47 | 15.64 |
| 1980 Year | 54.438 | 23.684 | 78.122 | 5,161.7 | 10.55 | 4.59 | 15.13 |
| 1981 Year | 51.678 | 24.490 | 76.168 | 5,291.7 | 9.77 | 4.63 | 14.39 |
| 1982 Year | 48.588 | 24.565 | 73.153 | 5,189.3 | 9.36 | 4.73 | 14.10 |
| 1983 Year | 47.275 | 25.763 | 73.038 | 5,423.8 | 8.72 | 4.75 | 13.47 |
| 1984 Year | 49.445 | 27.269 | 76.714 | 5,813.6 | 8.51 | 4.69 | 13.20 |
| 1985 Year | 48.626 | 27.865 | 76.491 | 6,053.7 | 8.03 | 4.60 | 12.64 |
| 1986 Year | 48.787 | 27.969 | 76.756 | 6,263.6 | 7.79 | 4.47 | 12.25 |
| 1987 Year | 50.505 | 28.668 | 79.173 | 6,475.1 | 7.80 | 4.43 | 12.23 |
| 1988 Year | 52.670 | 30.149 | 82.819 | 6,742.7 | 7.81 | 4.47 | 12.28 |
| 1989 Year | 53.813 | 31.131 | 84.944 | 6,981.4 | 7.71 | 4.46 | 12.17 |
| 1990 Year | 53.156 | 31.496 | 84.652 | 7,112.5 | 7.47 | 4.43 | 11.90 |
| 1991 Year | 52.878 | 31.729 | 84.607 | 7,100.5 | 7.45 | 4.47 | 11.92 |
| 1992 Year | 54.240 | 31.716 | 85.956 | 7,336.6 | 7.39 | 4.32 | 11.72 |
| 1993 Year | 54.973 | 32.630 | 87.603 | 7,532.7 | 7.30 | 4.33 | 11.63 |
| 1994 Year | 56.290 | 32.970 | 89.260 | 7,835.5 | 7.18 | 4.21 | 11.39 |
| 1995 Year | 57.108 | 34.064 | 91.173 | 8,031.7 | 7.11 | 4.24 | 11.35 |
| 1996 Year | 58.758 | 35.417 | 94.175 | 8,328.9 | 7.05 | 4.25 | 11.31 |
| 1997 Year | 59.382 | 35.383 | 94.765 | 8,703.5 | 6.82 | 4.07 | 10.89 |
| 1998 Year | 59.647 | 35.536 | 95.183 | 9,066.9 | 6.58 | 3.92 | 10.50 |
| 1999 Year | 60.747 | 36.070 | 96.817 | 9,470.3 | 6.41 | 3.81 | 10.22 |
| 2000 Year | 62.089 | 36.887 | 98.975 | 9,817.0 | 6.32 | 3.76 | 10.08 |
| 2001 Year | 60.959 | 35.367 | 96.326 | 9,890.7 | 6.16 | 3.58 | 9.74 |
| 2002 Year | 61.785 | 36.073 | 97.858 | 10,048.8 | 6.15 | 3.59 | 9.74 |
| 2003 Year | 61.706 | 36.503 | 98.209 | 10,301.0 | 5.99 | 3.54 | 9.53 |
| 2004 Year | 63.226 | 37.125 | 100.351 | 10,675.8 | 5.92 | 3.48 | 9.40 |
| 2005 Year | 62.977 | 37.529 | 100.506 | 10,989.5 | 5.73 | 3.41 | 9.15 |
| 2006 Year | 62.149 | 37.706 | 99.856 | 11,294.8 | 5.50 | 3.34 | 8.84 |
| 2007 Year | R 63.409 | 38.158 | R 101.568 | 11,523.9 | 5.50 | 3.31 | 8.81 |

[a] Coal, coal coke net imports, nuclear electric power, renewable energy, and electricity net imports.

R=Revised.

Notes: • Totals may not equal sum of components due to independent rounding. • Geographic coverage is the 50 States and the District of Columbia.

Web Page: http://www.eia.doe.gov/emeu/mer/overview.html.

Sources: • **Energy Consumption:** Table 1.3. • **Gross Domestic Product: 1973-2004**—U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business,* August 2008, Table 2A. **2005 forward**—U.S. Department of Commerce, Bureau of Economic Analysis, *BEA News Release,* September 26, 2008, Table 3, which is available at Web site http://www.bea.gov/bea/newsrel/gdpnewsrelease.htm.

**Table 6.1 Consumption Ratios of Fuel, 2002;**
**Level: National and Regional Data;**
**Row: NAICS Codes; Column: Energy-Consumption Ratios;**
**Unit: Varies.**

| NAICS Code(a) | Subsector and Industry | Consumption per Employee (million Btu) | Consumption per Dollar of Value Added (thousand Btu) | Consumption per Dollar of Value of Shipments (thousand Btu) | RSE Row Factors |
|---|---|---|---|---|---|
| | **Total United States** | | | | |
| | **RSE Column Factors:** | 1.1 | 0.9 | 1 | |
| 311 | Food | 867.8 | 6.0 | 2.6 | 5.9 |
| 311221 | Wet Corn Milling | 24,113.7 | 65.7 | 26.2 | 1.8 |
| 31131 | Sugar | 8,414.5 | 54.2 | 17.9 | 1 |
| 311421 | Fruit and Vegetable Canning | 824.1 | 5.4 | 2.5 | 10.6 |
| 312 | Beverage and Tobacco Products | 670.4 | 1.6 | 1.0 | 2.7 |
| 3121 | Beverages | 658.6 | 2.8 | 1.3 | 3.9 |
| 3122 | Tobacco | 729.4 | 0.6 | 0.5 | 1 |
| 313 | Textile Mills | 798.7 | 11.2 | 4.3 | 8 |
| 314 | Textile Product Mills | 345.3 | 4.7 | 1.6 | 10.3 |
| 315 | Apparel | 101.7 | 1.8 | 0.9 | 9.3 |
| 316 | Leather and Allied Products | 152.1 | 2.4 | 1.1 | 11.7 |
| 321 | Wood Products | 741.7 | 10.6 | 4.2 | 4.9 |
| 321113 | Sawmills | 1,383.0 | 20.3 | 6.5 | 3.6 |
| 3212 | Veneer, Plywood, and Engineered Woods | 1,574.9 | 19.1 | 7.2 | 12.8 |
| 3219 | Other Wood Products | 245.5 | 3.7 | 1.7 | 6.3 |
| 322 | Paper | 5,038.0 | 31.1 | 15.2 | 3.3 |
| 322110 | Pulp Mills | 24,711.6 | 116.6 | 56.0 | 1 |
| 322121 | Paper Mills, except Newsprint | 10,401.1 | 40.4 | 22.5 | 1.6 |
| 322122 | Newsprint Mills | 13,933.8 | 62.1 | 29.1 | 1 |
| 322130 | Paperboard Mills | 18,603.0 | 82.1 | 42.1 | 3.9 |
| 323 | Printing and Related Support | 152.6 | 1.8 | 1.1 | 5.6 |
| 324 | Petroleum and Coal Products | 31,369.9 | 91.3 | 15.0 | 3.3 |
| 324110 | Petroleum Refineries | 50,515.2 | 116.3 | 16.1 | 2.6 |
| 324199 | Other Petroleum and Coal Products | 10,950.9 | 59.8 | 17.5 | 3.1 |
| 325 | Chemicals | 4,824.6 | 15.3 | 8.5 | 3.3 |
| 325110 | Petrochemicals | 50,352.3 | 77.4 | 23.2 | 1 |
| 325120 | Industrial Gases | 21,565.2 | 44.1 | 28.4 | 11.6 |
| 325181 | Alkalies and Chlorine | 29,066.6 | 143.3 | 63.2 | 2.3 |
| 325182 | Carbon Black | 22,898.4 | 77.3 | 42.0 | 1 |
| 325188 | Other Basic Inorganic Chemicals | 4,156.1 | 21.4 | 11.7 | 4.9 |
| 325192 | Cyclic Crudes and Intermediates | 11,541.3 | 36.8 | 12.6 | 1 |
| 325193 | Ethyl Alcohol | 26,688.9 | 65.4 | 24.4 | 8.4 |
| 325199 | Other Basic Organic Chemicals | 13,358.7 | 66.8 | 22.8 | 11.4 |
| 325211 | Plastics Materials and Resins | 8,899.1 | 41.4 | 14.5 | 7.9 |
| 325212 | Synthetic Rubber | 4,584.0 | 16.7 | 8.0 | 21.3 |
| 325222 | Noncellulosic Organic Fibers | 3,026.0 | 19.1 | 8.4 | 1.3 |
| 325311 | Nitrogenous Fertilizers | 46,585.3 | 202.5 | 58.7 | 1 |
| 325312 | Phosphatic Fertilizers | 4,095.1 | 19.5 | 6.6 | 1 |
| 3254 | Pharmaceuticals and Medicines | 525.5 | 1.2 | 0.8 | 3.9 |
| 325412 | Pharmaceutical Preparation | 514.0 | 1.0 | 0.7 | 4.6 |
| 325992 | Photographic Film, Paper, Plate, and Chemicals | 804.1 | 2.7 | 2.2 | 13.1 |
| 326 | Plastics and Rubber Products | 375.5 | 3.9 | 2.1 | 4.6 |
| 327 | Nonmetallic Mineral Products | 2,434.9 | 20.7 | 11.7 | 5 |
| 3272 | Glass and Glass Products | 2,002.5 | 16.7 | 9.9 | 3.9 |
| 327211 | Flat Glass | 6,783.2 | 36.9 | 22.5 | 1 |
| 327213 | Glass Containers | 4,239.0 | 24.3 | 15.1 | 1 |
| 327310 | Cements | 24,086.5 | 95.5 | 56.0 | 3.2 |
| 327410 | Lime | 25,007.2 | 189.6 | 101.9 | 1 |
| 327993 | Mineral Wool | 2,400.9 | 18.0 | 10.8 | 9 |
| 331 | Primary Metals | 4,170.7 | 34.6 | 14.2 | 2 |
| 331111 | Iron and Steel Mills | 11,293.6 | 66.5 | 27.8 | 3.6 |
| 331112 | Electrometallurgical Ferroalloy Products | 5,583.6 | 46.1 | 14.3 | 2.1 |
| 3312 | Steel Products from Purchased Steel | 871.3 | 7.4 | 2.6 | 4.9 |

**Table 6.1 Consumption Ratios of Fuel, 2002;**
**Level: National and Regional Data;**
**Row: NAICS Codes; Column: Energy-Consumption Ratios;**
**Unit: Varies.**

| NAICS Code(a) | Subsector and Industry | Consumption per Employee (million Btu) | Consumption per Dollar of Value Added (thousand Btu) | Consumption per Dollar of Value of Shipments (thousand Btu) | RSE Row Factors |
|---|---|---|---|---|---|
| 3313 | Alumina and Aluminum | 4,496.8 | 34.3 | 12.2 | 5.1 |
| 331312 | Primary Aluminum | 16,159.7 | 112.3 | 38.5 | 2.3 |
| 3314 | Nonferrous Metals, except Aluminum | 1,373.1 | 12.0 | 4.1 | 6.3 |
| 3315 | Foundries | 866.3 | 10.3 | 5.6 | 2.6 |
| 331511 | Iron Foundries | 1,224.5 | 15.0 | 7.7 | 3.6 |
| 331521 | Aluminum Die-Casting Foundries | 814.2 | 9.5 | 4.7 | 7 |
| 331524 | Aluminum Foundries, except Die-Casting | 642.8 | 7.6 | 4.5 | 5.2 |
| 332 | Fabricated Metal Products | 258.4 | 3.0 | 1.7 | 6 |
| 333 | Machinery | 157.5 | 1.4 | 0.7 | 6.3 |
| 334 | Computer and Electronic Products | 141.1 | 0.9 | 0.5 | 7.3 |
| 334413 | Semiconductors and Related Devices | 387.7 | 1.3 | 1.0 | 4.1 |
| 335 | Electrical Equip., Appliances, and Components | 211.2 | 1.9 | 1.0 | 5.3 |
| 336 | Transportation Equipment | 278.6 | 1.8 | 0.7 | 3.9 |
| 336112 | Light Trucks and Utility Vehicles | 618.0 | 1.5 | 0.4 | 1 |
| 337 | Furniture and Related Products | 113.7 | 1.6 | 0.9 | 6 |
| 339 | Miscellaneous | 101.5 | 0.9 | 0.6 | 6 |
| | Total | 1,172.2 | 8.9 | 4.2 | 2 |
| | **Northeast Census Region** | | | | |
| | **RSE Column Factors:** | 1.1 | 1 | 0.9 | |
| 311 | Food | 497.0 | 3.0 | 1.6 | 11.3 |
| 311221 | Wet Corn Milling | 1,829.8 | 18.1 | 6.8 | 1 |
| 31131 | Sugar | 6,383.9 | 23.2 | 4.7 | 1 |
| 311421 | Fruit and Vegetable Canning | 720.7 | 3.9 | 2.0 | 13.4 |
| 312 | Beverage and Tobacco Products | 587.1 | 2.9 | 1.4 | 9.4 |
| 3121 | Beverages | 586.9 | 3.0 | 1.3 | 10.1 |
| 3122 | Tobacco | 591.5 | 1.8 | 1.5 | 1 |
| 313 | Textile Mills | 489.1 | 6.1 | 3.1 | 14 |
| 314 | Textile Product Mills | 175.2 | 2.8 | 1.1 | 15 |
| 315 | Apparel | 72.3 | 1.4 | 0.6 | 22 |
| 316 | Leather and Allied Products | 233.9 | 2.1 | 1.2 | 13 |
| 321 | Wood Products | 354.1 | 5.4 | 2.5 | 11.6 |
| 321113 | Sawmills | 670.2 | 10.9 | 4.1 | 8.3 |
| 3212 | Veneer, Plywood, and Engineered Woods | 775.3 | 12.0 | 5.9 | 27.2 |
| 3219 | Other Wood Products | 221.6 | 3.4 | 1.7 | 15.6 |
| 322 | Paper | 3,001.3 | 19.9 | 9.3 | 10.6 |
| 322110 | Pulp Mills | 2,990.2 | 23.7 | 7.5 | 38 |
| 322121 | Paper Mills, except Newsprint | 8,502.4 | 35.3 | 16.4 | 2.3 |
| 322122 | Newsprint Mills | 7,933.3 | 28.7 | 15.1 | 1 |
| 322130 | Paperboard Mills | 8,358.9 | 51.6 | 25.2 | 4.6 |
| 323 | Printing and Related Support | 152.8 | 1.7 | 1.1 | 11.7 |
| 324 | Petroleum and Coal Products | 15,783.3 | 53.0 | 10.0 | 4.1 |
| 324110 | Petroleum Refineries | 34,946.2 | 74.9 | 11.2 | 1.4 |
| 324199 | Other Petroleum and Coal Products | 4,226.8 | 41.6 | 7.9 | 1 |
| 325 | Chemicals | 840.4 | 2.2 | 1.6 | 5.2 |
| 325110 | Petrochemicals | 977.5 | 5.5 | 2.0 | 5.8 |
| 325120 | Industrial Gases | 4,552.7 | 16.3 | 11.7 | 1.6 |
| 325181 | Alkalies and Chlorine | 12,131.8 | 56.2 | 33.4 | 13.4 |
| 325182 | Carbon Black | 0.0 | 0.0 | 0.0 | 0 |
| 325188 | Other Basic Inorganic Chemicals | 2,127.1 | 11.8 | 5.2 | 5.5 |
| 325192 | Cyclic Crudes and Intermediates | 4,378.2 | 8.9 | 4.1 | 1 |
| 325193 | Ethyl Alcohol | 2,378.4 | 7.3 | 1.6 | 1 |
| 325199 | Other Basic Organic Chemicals | 2,151.7 | 9.0 | 4.4 | 6.9 |
| 325211 | Plastics Materials and Resins | 1,312.8 | 10.0 | 3.6 | 29 |
| 325212 | Synthetic Rubber | 1,179.3 | 3.9 | 1.9 | 1 |

**Table 6.1 Consumption Ratios of Fuel, 2002;**
**Level: National and Regional Data;**
**Row: NAICS Codes; Column: Energy-Consumption Ratios;**
**Unit: Varies.**

| NAICS Code(a) | Subsector and Industry | Consumption per Employee (million Btu) | Consumption per Dollar of Value Added (thousand Btu) | Consumption per Dollar of Value of Shipments (thousand Btu) | RSE Row Factors |
|---|---|---|---|---|---|
| 325222 | Noncellulosic Organic Fibers | Q | Q | Q | 0 |
| 325311 | Nitrogenous Fertilizers | 8,984.2 | 54.9 | 20.7 | 1 |
| 325312 | Phosphatic Fertilizers | 0.0 | 0.0 | 0.0 | 0 |
| 3254 | Pharmaceuticals and Medicines | 486.2 | 0.9 | 0.7 | 7 |
| 325412 | Pharmaceutical Preparation | 428.0 | 0.7 | 0.5 | 7.6 |
| 325992 | Photographic Film, Paper, Plate, and Chemicals | 1,076.5 | 3.0 | 3.0 | 4.6 |
| 326 | Plastics and Rubber Products | 286.2 | 3.3 | 1.7 | 10.3 |
| 327 | Nonmetallic Mineral Products | 1,942.0 | 16.3 | 9.1 | 11.9 |
| 3272 | Glass and Glass Products | 1,839.3 | 16.5 | 10.7 | 8.5 |
| 327211 | Flat Glass | 7,171.3 | 41.0 | 24.1 | 1 |
| 327213 | Glass Containers | 3,306.7 | 20.4 | 13.0 | 1 |
| 327310 | Cements | 23,317.4 | 104.8 | 62.2 | 1 |
| 327410 | Lime | 12,774.6 | 147.8 | 67.9 | 1 |
| 327993 | Mineral Wool | 1,301.5 | 10.4 | 6.8 | 11.9 |
| 331 | Primary Metals | 2,743.8 | 23.2 | 9.8 | 4.8 |
| 331111 | Iron and Steel Mills | 5,935.3 | 37.2 | 17.1 | 8.8 |
| 331112 | Electrometallurgical Ferroalloy Products | 6,701.3 | 43.5 | 22.0 | 1 |
| 3312 | Steel Products from Purchased Steel | 636.7 | 4.9 | 1.9 | 6.6 |
| 3313 | Alumina and Aluminum | 2,853.1 | 26.0 | 8.3 | 16 |
| 331312 | Primary Aluminum | 24,353.8 | 78.8 | 31.1 | 1 |
| 3314 | Nonferrous Metals, except Aluminum | 1,232.1 | 11.2 | 4.3 | 7.7 |
| 3315 | Foundries | 1,007.7 | 13.9 | 8.1 | 3.3 |
| 331511 | Iron Foundries | 2,049.1 | 23.6 | 13.6 | 2.9 |
| 331521 | Aluminum Die-Casting Foundries | 398.6 | 5.6 | 3.7 | 4.8 |
| 331524 | Aluminum Foundries, except Die-Casting | 768.5 | 10.2 | 6.3 | 2.6 |
| 332 | Fabricated Metal Products | 180.1 | 1.7 | 1.1 | 14.2 |
| 333 | Machinery | 143.4 | 1.3 | 0.7 | 10.7 |
| 334 | Computer and Electronic Products | 213.8 | 1.6 | 0.9 | 8.6 |
| 334413 | Semiconductors and Related Devices | 432.0 | 2.3 | 1.5 | 1.4 |
| 335 | Electrical Equip., Appliances, and Components | 229.1 | 2.1 | 1.2 | 10 |
| 336 | Transportation Equipment | 301.5 | 2.3 | 1.1 | 6.9 |
| 336112 | Light Trucks and Utility Vehicles | 653.5 | 2.3 | 0.7 | 1 |
| 337 | Furniture and Related Products | 108.7 | 1.5 | 0.8 | 12 |
| 339 | Miscellaneous | 107.1 | 1.0 | 0.6 | 10.7 |
| | Total | 613.0 | 4.5 | 2.5 | 3 |
| | **Midwest Census Region** | | | | |
| | **RSE Column Factors:** | 1.1 | 1 | 0.9 | |
| 311 | Food | 1,368.3 | 8.9 | 3.2 | 8 |
| 311221 | Wet Corn Milling | 25,884.2 | 68.6 | 27.2 | 1 |
| 31131 | Sugar | 10,868.3 | 51.1 | 21.0 | 1 |
| 311421 | Fruit and Vegetable Canning | 531.5 | 2.9 | 1.5 | 5.2 |
| 312 | Beverage and Tobacco Products | 884.6 | 3.7 | 1.7 | 6.1 |
| 3121 | Beverages | 894.6 | 4.2 | 1.8 | 6.7 |
| 3122 | Tobacco | 310.9 | 0.2 | 0.2 | 1 |
| 313 | Textile Mills | 347.8 | 4.0 | 2.1 | 13.2 |
| 314 | Textile Product Mills | 109.6 | 2.1 | 0.9 | 15.3 |
| 315 | Apparel | 60.4 | 1.0 | 0.6 | 15.9 |
| 316 | Leather and Allied Products | 293.1 | 4.7 | 1.7 | 12.4 |
| 321 | Wood Products | 369.4 | 5.0 | 2.4 | 7 |
| 321113 | Sawmills | 502.0 | 7.3 | 2.9 | 10.6 |
| 3212 | Veneer, Plywood, and Engineered Woods | 993.2 | 14.1 | 6.4 | 14.9 |
| 3219 | Other Wood Products | 189.7 | 2.5 | 1.3 | 9 |
| 322 | Paper | 2,392.3 | 15.0 | 7.4 | 5.3 |
| 322110 | Pulp Mills | 34,283.2 | 179.1 | 71.4 | 1 |

**Table 6.1 Consumption Ratios of Fuel, 2002;**
**Level: National and Regional Data;**
**Row: NAICS Codes; Column: Energy-Consumption Ratios;**
**Unit: Varies.**

| NAICS Code(a) | Subsector and Industry | Consumption per Employee (million Btu) | Consumption per Dollar of Value Added (thousand Btu) | Consumption per Dollar of Value of Shipments (thousand Btu) | RSE Row Factors |
|---|---|---|---|---|---|
| 322121 | Paper Mills, except Newsprint | 6,551.1 | 27.1 | 15.9 | 2.6 |
| 322122 | Newsprint Mills | 9,345.2 | 44.8 | 21.1 | 1 |
| 322130 | Paperboard Mills | 9,538.2 | 48.4 | 27.9 | 6.6 |
| 323 | Printing and Related Support | 149.0 | 1.7 | 1.1 | 9.3 |
| 324 | Petroleum and Coal Products | 21,394.9 | 84.9 | 13.5 | 5.5 |
| 324110 | Petroleum Refineries | 49,945.5 | 127.4 | 14.9 | 2.6 |
| 324199 | Other Petroleum and Coal Products | 9,346.9 | 148.3 | 30.2 | 1 |
| 325 | Chemicals | 2,609.6 | 7.8 | 4.8 | 6.5 |
| 325110 | Petrochemicals | 11,100.4 | -84.1 | 36.7 | 1 |
| 325120 | Industrial Gases | 41,922.9 | 64.0 | 48.6 | 12 |
| 325181 | Alkalies and Chlorine | 9,651.6 | 40.5 | 15.3 | 11.1 |
| 325182 | Carbon Black | 7,326.5 | 38.3 | 18.2 | 1 |
| 325188 | Other Basic Inorganic Chemicals | 6,475.1 | 27.8 | 16.6 | 6 |
| 325192 | Cyclic Crudes and Intermediates | 23,326.8 | 129.6 | 21.8 | 1 |
| 325193 | Ethyl Alcohol | 31,894.1 | 66.1 | 26.3 | 9.8 |
| 325199 | Other Basic Organic Chemicals | 4,906.1 | 32.1 | 12.4 | 10.4 |
| 325211 | Plastics Materials and Resins | 2,951.8 | 15.9 | 7.4 | 16.6 |
| 325212 | Synthetic Rubber | 3,213.6 | 14.1 | 6.5 | 7.7 |
| 325222 | Noncellulosic Organic Fibers | 0.0 | 0.0 | 0.0 | 0 |
| 325311 | Nitrogenous Fertilizers | 32,234.4 | 105.5 | 34.2 | 1 |
| 325312 | Phosphatic Fertilizers | 0.0 | 0.0 | 0.0 | 0 |
| 3254 | Pharmaceuticals and Medicines | 847.5 | 2.0 | 1.4 | 4.8 |
| 325412 | Pharmaceutical Preparation | 829.3 | 1.8 | 1.3 | 5 |
| 325992 | Photographic Film, Paper, Plate, and Chemicals | 369.1 | 1.8 | 1.0 | 8.1 |
| 326 | Plastics and Rubber Products | 388.2 | 4.0 | 2.2 | 7 |
| 327 | Nonmetallic Mineral Products | 2,362.4 | 20.4 | 11.9 | 8 |
| 3272 | Glass and Glass Products | 1,847.0 | 14.9 | 8.7 | 5.3 |
| 327211 | Flat Glass | 7,927.8 | 44.9 | 29.5 | 1 |
| 327213 | Glass Containers | 4,574.3 | 24.9 | 15.9 | 1 |
| 327310 | Cements | 24,602.2 | 92.5 | 59.6 | 4 |
| 327410 | Lime | 30,884.9 | 311.6 | 135.8 | 1 |
| 327993 | Mineral Wool | 2,989.0 | 18.2 | 11.4 | 8.5 |
| 331 | Primary Metals | 5,072.5 | 43.4 | 18.6 | 2.3 |
| 331111 | Iron and Steel Mills | 14,909.3 | 88.3 | 37.0 | 4.8 |
| 331112 | Electrometallurgical Ferroalloy Products | 5,245.8 | 42.6 | 13.1 | 1 |
| 3312 | Steel Products from Purchased Steel | 1,010.2 | 8.8 | 3.2 | 8.1 |
| 3313 | Alumina and Aluminum | 4,730.7 | 33.7 | 11.2 | 4.3 |
| 331312 | Primary Aluminum | 15,640.5 | 133.6 | 41.7 | 1 |
| 3314 | Nonferrous Metals, except Aluminum | 1,386.4 | 13.9 | 5.1 | 7.2 |
| 3315 | Foundries | 858.6 | 10.0 | 5.5 | 3.3 |
| 331511 | Iron Foundries | 1,143.2 | 14.4 | 7.6 | 3.6 |
| 331521 | Aluminum Die-Casting Foundries | 899.7 | 9.8 | 4.8 | 8.6 |
| 331524 | Aluminum Foundries, except Die-Casting | 663.2 | 7.4 | 4.3 | 8.5 |
| 332 | Fabricated Metal Products | 380.4 | 4.5 | 2.5 | 10 |
| 333 | Machinery | 192.9 | 1.6 | 0.8 | 10.7 |
| 334 | Computer and Electronic Products | 152.1 | 1.1 | 0.6 | 12.5 |
| 334413 | Semiconductors and Related Devices | 578.4 | 6.2 | 3.4 | 19.3 |
| 335 | Electrical Equip., Appliances, and Components | 197.4 | 1.6 | 0.8 | 8.3 |
| 336 | Transportation Equipment | 388.7 | 2.1 | 0.8 | 4.9 |
| 336112 | Light Trucks and Utility Vehicles | 614.2 | 1.5 | 0.4 | 1 |
| 337 | Furniture and Related Products | 178.4 | 1.9 | 1.1 | 8.7 |
| 339 | Miscellaneous | 107.9 | 1.0 | 0.6 | 12.7 |
| | Total | 1,007.4 | 7.5 | 3.4 | 2.6 |
| | **South Census Region** | | | | |
| | **RSE Column Factors:** | 1.1 | 0.9 | 1 | |

**Table 6.1 Consumption Ratios of Fuel, 2002;**
**Level: National and Regional Data;**
**Row: NAICS Codes; Column: Energy-Consumption Ratios;**
**Unit: Varies.**

| NAICS Code(a) | Subsector and Industry | Consumption per Employee (million Btu) | Consumption per Dollar of Value Added (thousand Btu) | Consumption per Dollar of Value of Shipments (thousand Btu) | RSE Row Factors |
|---|---|---|---|---|---|
| 311 | Food | 659.1 | 4.6 | 2.2 | 11.5 |
| 311221 | Wet Corn Milling | 23,186.1 | 60.1 | 21.8 | 1 |
| 31131 | Sugar | 9,481.7 | 77.9 | 19.5 | 1 |
| 311421 | Fruit and Vegetable Canning | 1,378.2 | 7.8 | 3.4 | 13.7 |
| 312 | Beverage and Tobacco Products | 724.2 | 1.0 | 0.7 | 3.3 |
| 3121 | Beverages | 710.5 | 2.5 | 1.3 | 7.2 |
| 3122 | Tobacco | 746.0 | 0.5 | 0.5 | 1 |
| 313 | Textile Mills | 893.6 | 13.3 | 4.7 | 10 |
| 314 | Textile Product Mills | 479.5 | 6.2 | 1.9 | 14.2 |
| 315 | Apparel | 149.4 | 2.8 | 1.4 | 15.3 |
| 316 | Leather and Allied Products | 70.4 | 1.5 | 0.7 | 18 |
| 321 | Wood Products | 1,041.8 | 14.8 | 5.4 | 9.4 |
| 321113 | Sawmills | 1,601.8 | 25.3 | 8.0 | 5.9 |
| 3212 | Veneer, Plywood, and Engineered Woods | 2,039.2 | 20.6 | 7.4 | 20.5 |
| 3219 | Other Wood Products | 357.8 | 5.9 | 2.5 | 11.6 |
| 322 | Paper | 8,352.5 | 46.9 | 24.0 | 4.3 |
| 322110 | Pulp Mills | 25,125.2 | 115.2 | 56.4 | 1 |
| 322121 | Paper Mills, except Newsprint | 15,854.0 | 56.9 | 34.6 | 2.5 |
| 322122 | Newsprint Mills | 14,279.8 | 62.7 | 33.3 | 1 |
| 322130 | Paperboard Mills | 21,190.7 | 83.7 | 44.2 | 4.7 |
| 323 | Printing and Related Support | 165.6 | 2.0 | 1.3 | 10 |
| 324 | Petroleum and Coal Products | 38,178.5 | 106.9 | 15.6 | 4.5 |
| 324110 | Petroleum Refineries | 55,186.9 | 134.1 | 16.6 | 3.3 |
| 324199 | Other Petroleum and Coal Products | 13,038.5 | 61.5 | 18.1 | 4.3 |
| 325 | Chemicals | 9,754.0 | 33.3 | 14.7 | 5.9 |
| 325110 | Petrochemicals | 53,163.0 | 77.1 | 23.3 | 1 |
| 325120 | Industrial Gases | 24,615.2 | 48.1 | 26.6 | 23.4 |
| 325181 | Alkalies and Chlorine | 32,404.6 | 173.8 | 72.2 | 1 |
| 325182 | Carbon Black | 25,034.7 | 80.4 | 44.2 | 1 |
| 325188 | Other Basic Inorganic Chemicals | 3,248.6 | 18.3 | 10.0 | 5.8 |
| 325192 | Cyclic Crudes and Intermediates | 12,922.1 | 47.5 | 15.1 | 1 |
| 325193 | Ethyl Alcohol | 1,880.6 | 10.0 | 2.5 | 1 |
| 325199 | Other Basic Organic Chemicals | 17,240.1 | 84.3 | 26.5 | 14.3 |
| 325211 | Plastics Materials and Resins | 15,800.3 | 60.2 | 18.6 | 7.3 |
| 325212 | Synthetic Rubber | 5,646.8 | 18.7 | 8.9 | 26.5 |
| 325222 | Noncellulosic Organic Fibers | 3,178.0 | 19.5 | 8.5 | 1 |
| 325311 | Nitrogenous Fertilizers | 55,477.7 | 227.0 | 67.6 | 1 |
| 325312 | Phosphatic Fertilizers | 3,691.2 | 17.2 | 5.4 | 1 |
| 3254 | Pharmaceuticals and Medicines | 548.7 | 1.2 | 0.8 | 5.4 |
| 325412 | Pharmaceutical Preparation | 517.2 | 1.0 | 0.6 | 5.9 |
| 325992 | Photographic Film, Paper, Plate, and Chemicals | Q | Q | 1.3 | 37.9 |
| 326 | Plastics and Rubber Products | 458.9 | 4.5 | 2.3 | 7.2 |
| 327 | Nonmetallic Mineral Products | 2,744.7 | 22.7 | 13.3 | 9 |
| 3272 | Glass and Glass Products | 2,310.0 | 18.4 | 10.8 | 7.1 |
| 327211 | Flat Glass | 6,326.5 | 31.5 | 19.0 | 1 |
| 327213 | Glass Containers | 5,171.6 | 28.0 | 17.2 | 1 |
| 327310 | Cements | 25,444.6 | 97.2 | 59.8 | 3 |
| 327410 | Lime | 22,910.3 | 145.5 | 91.9 | 1 |
| 327993 | Mineral Wool | 2,597.3 | 22.2 | 12.4 | 20.8 |
| 331 | Primary Metals | 4,442.3 | 33.6 | 13.1 | 3.6 |
| 331111 | Iron and Steel Mills | 9,823.4 | 54.3 | 22.7 | 4.4 |
| 331112 | Electrometallurgical Ferroalloy Products | 11,879.6 | 131.4 | 31.5 | 25.6 |
| 3312 | Steel Products from Purchased Steel | 880.4 | 8.4 | 2.7 | 9.4 |
| 3313 | Alumina and Aluminum | 5,324.8 | 36.4 | 14.1 | 8.6 |
| 331312 | Primary Aluminum | 17,228.3 | 121.6 | 43.1 | 1 |
| 3314 | Nonferrous Metals, except Aluminum | 1,430.6 | 12.3 | 3.4 | 15.5 |

**Table 6.1 Consumption Ratios of Fuel, 2002;**
**Level: National and Regional Data;**
**Row: NAICS Codes; Column: Energy-Consumption Ratios;**
**Unit: Varies.**

| NAICS Code(a) | Subsector and Industry | Consumption per Employee (million Btu) | Consumption per Dollar of Value Added (thousand Btu) | Consumption per Dollar of Value of Shipments (thousand Btu) | RSE Row Factors |
|---|---|---|---|---|---|
| 3315 | Foundries | 1,065.6 | 12.2 | 6.1 | 3.2 |
| 331511 | Iron Foundries | 1,148.5 | 13.3 | 6.2 | 3.9 |
| 331521 | Aluminum Die-Casting Foundries | 882.0 | 10.5 | 5.4 | 4.5 |
| 331524 | Aluminum Foundries, except Die-Casting | 724.3 | 9.1 | 5.2 | 3.9 |
| 332 | Fabricated Metal Products | 253.4 | 3.3 | 1.6 | 10.9 |
| 333 | Machinery | 137.5 | 1.3 | 0.6 | 11 |
| 334 | Computer and Electronic Products | 114.8 | 0.9 | 0.4 | 10.7 |
| 334413 | Semiconductors and Related Devices | 462.7 | 2.6 | 1.8 | 7.5 |
| 335 | Electrical Equip., Appliances, and Components | 216.2 | 2.1 | 1.0 | 9.6 |
| 336 | Transportation Equipment | 237.1 | 1.6 | 0.6 | 5.6 |
| 336112 | Light Trucks and Utility Vehicles | 623.5 | 1.5 | 0.5 | 1 |
| 337 | Furniture and Related Products | 107.0 | 1.8 | 1.0 | 11.7 |
| 339 | Miscellaneous | 130.5 | 1.2 | 0.7 | 11.7 |
| | Total | 1,879.6 | 14.3 | 6.3 | 2.6 |
| | **West Census Region** | | | | |
| | **RSE Column Factors:** | 1.1 | 0.9 | 1 | |
| 311 | Food | 754.3 | 6.3 | 2.6 | 10 |
| 311221 | Wet Corn Milling | 7,758.4 | 29.3 | 18.2 | 25.6 |
| 31131 | Sugar | 5,437.1 | 35.3 | 16.8 | 1 |
| 311421 | Fruit and Vegetable Canning | 776.6 | 6.4 | 2.9 | 23.6 |
| 312 | Beverage and Tobacco Products | 516.4 | 2.1 | 1.1 | 6.9 |
| 3121 | Beverages | 517.6 | 2.1 | 1.1 | 6.9 |
| 3122 | Tobacco | 11.4 | 0.3 | 0.2 | 1 |
| 313 | Textile Mills | 843.9 | 9.6 | 4.8 | 28.7 |
| 314 | Textile Product Mills | 96.1 | 1.2 | 0.7 | 19.6 |
| 315 | Apparel | 86.7 | 1.5 | 0.7 | 14.3 |
| 316 | Leather and Allied Products | Q | 0.3 | 0.2 | 36.3 |
| 321 | Wood Products | 831.2 | 12.2 | 4.3 | 5.9 |
| 321113 | Sawmills | 1,638.8 | 21.0 | 6.2 | 6.6 |
| 3212 | Veneer, Plywood, and Engineered Woods | 1,436.7 | 21.8 | 7.3 | 9.9 |
| 3219 | Other Wood Products | 143.2 | 2.3 | 1.0 | 12 |
| 322 | Paper | 4,987.7 | 35.9 | 15.7 | 7.2 |
| 322110 | Pulp Mills | 17,826.3 | 100.1 | 47.5 | 1 |
| 322121 | Paper Mills, except Newsprint | 11,685.0 | 39.4 | 24.0 | 7 |
| 322122 | Newsprint Mills | 17,185.3 | 86.8 | 31.2 | 1 |
| 322130 | Paperboard Mills | 20,002.2 | 119.8 | 47.9 | 7.2 |
| 323 | Printing and Related Support | 139.1 | 1.6 | 1.0 | 12 |
| 324 | Petroleum and Coal Products | 38,270.9 | 83.8 | 17.1 | 6.8 |
| 324110 | Petroleum Refineries | 46,866.4 | 94.2 | 18.1 | 6.6 |
| 324199 | Other Petroleum and Coal Products | 26,296.8 | 47.4 | 27.0 | 1 |
| 325 | Chemicals | 1,621.2 | 7.3 | 4.2 | 5.3 |
| 325110 | Petrochemicals | 0.0 | 0.0 | 0.0 | 0 |
| 325120 | Industrial Gases | 13,420.5 | 23.9 | 17.4 | 12.6 |
| 325181 | Alkalies and Chlorine | 34,815.3 | 138.0 | 68.4 | 1 |
| 325182 | Carbon Black | 113.1 | 1.6 | 1.0 | 1 |
| 325188 | Other Basic Inorganic Chemicals | 13,740.8 | 42.4 | 27.4 | 12.6 |
| 325192 | Cyclic Crudes and Intermediates | 1,881.1 | 9.7 | 3.2 | 1 |
| 325193 | Ethyl Alcohol | 8,733.6 | 179.7 | 18.3 | 1 |
| 325199 | Other Basic Organic Chemicals | 2,086.6 | 8.8 | 5.7 | 17.4 |
| 325211 | Plastics Materials and Resins | 1,433.1 | 8.5 | 2.9 | 15.8 |
| 325212 | Synthetic Rubber | 151.8 | 1.2 | 0.7 | 1 |
| 325222 | Noncellulosic Organic Fibers | 13.5 | 0.3 | 0.2 | 1 |
| 325311 | Nitrogenous Fertilizers | 48,221.9 | 859.0 | 91.9 | 1 |
| 325312 | Phosphatic Fertilizers | 5,487.4 | 28.0 | 13.8 | 1 |

**Table 6.1 Consumption Ratios of Fuel, 2002;**
**Level: National and Regional Data;**
**Row: NAICS Codes; Column: Energy-Consumption Ratios;**
**Unit: Varies.**

| NAICS Code(a) | Subsector and Industry | Consumption per Employee (million Btu) | Consumption per Dollar of Value Added (thousand Btu) | Consumption per Dollar of Value of Shipments (thousand Btu) | RSE Row Factors |
|---|---|---|---|---|---|
| 3254 | Pharmaceuticals and Medicines | 201.1 | 0.9 | 0.5 | 4.3 |
| 325412 | Pharmaceutical Preparation | 216.8 | 0.7 | 0.4 | 5.6 |
| 325992 | Photographic Film, Paper, Plate, and Chemicals | 661.6 | 2.1 | 1.2 | 1 |
| 326 | Plastics and Rubber Products | 226.5 | 2.6 | 1.3 | 11.3 |
| 327 | Nonmetallic Mineral Products | 2,434.6 | 21.6 | 11.0 | 10 |
| 3272 | Glass and Glass Products | 1,826.7 | 16.9 | 9.8 | 4.6 |
| 327211 | Flat Glass | 5,534.4 | 35.9 | 20.6 | 1 |
| 327213 | Glass Containers | 3,808.0 | 22.8 | 13.5 | 1 |
| 327310 | Cements | 21,910.5 | 91.5 | 44.5 | 9.2 |
| 327410 | Lime | 25,167.8 | 137.3 | 75.7 | 1 |
| 327993 | Mineral Wool | 1,869.8 | 15.6 | 9.1 | 9.6 |
| 331 | Primary Metals | 1,773.8 | 15.9 | 6.3 | 4.9 |
| 331111 | Iron and Steel Mills | 5,062.0 | 31.0 | 9.6 | 2.7 |
| 331112 | Electrometallurgical Ferroalloy Products | 668.0 | 7.0 | 2.2 | 1 |
| 3312 | Steel Products from Purchased Steel | 607.0 | 4.2 | 1.5 | 7.4 |
| 3313 | Alumina and Aluminum | 3,106.5 | 37.0 | 11.6 | 7.2 |
| 331312 | Primary Aluminum | 10,126.9 | 85.1 | 26.1 | 10.5 |
| 3314 | Nonferrous Metals, except Aluminum | 1,496.0 | 10.5 | 4.1 | 13.1 |
| 3315 | Foundries | 397.0 | 4.8 | 3.0 | 9.3 |
| 331511 | Iron Foundries | 932.8 | 12.1 | 6.7 | 1.3 |
| 331521 | Aluminum Die-Casting Foundries | 227.8 | 4.9 | 1.7 | 21.6 |
| 331524 | Aluminum Foundries, except Die-Casting | 333.4 | 4.2 | 3.1 | 6 |
| 332 | Fabricated Metal Products | 123.6 | 1.5 | 0.8 | 10.7 |
| 333 | Machinery | 98.9 | 1.1 | 0.6 | 11.7 |
| 334 | Computer and Electronic Products | 116.5 | 0.7 | 0.4 | 12.2 |
| 334413 | Semiconductors and Related Devices | 338.0 | 0.9 | 0.7 | 4.9 |
| 335 | Electrical Equip., Appliances, and Components | 216.4 | 1.9 | 1.1 | 12.3 |
| 336 | Transportation Equipment | 111.6 | 0.9 | 0.4 | 14.2 |
| 336112 | Light Trucks and Utility Vehicles | 65.4 | 0.6 | 0.2 | 1 |
| 337 | Furniture and Related Products | 47.1 | 0.7 | 0.4 | 12.9 |
| 339 | Miscellaneous | 65.7 | 0.5 | 0.3 | 10.7 |
| | Total | 737.1 | 5.8 | 2.9 | 4.6 |

(a) The Bureau of the Census classifies establishments using the North American Industry Classification System (NAICS).

NF=No applicable RSE row/column factor.

* Estimate less than 0.5.

W=Withheld to avoid disclosing data for individual establishments.

Q=Withheld because Relative Standard Error is greater than 50 percent.

NA=Not available.

Notes: To obtain the RSE percentage for any table cell, multiply the cell's corresponding RSE column and RSE row factors. Totals may not equal sum of components because of independent rounding.
Operating ratios were calculated using the estimates of fuel consumption reported in Table 3.2.

Source: Energy Information Administration, Office of Energy Markets and End Use, Energy Consumption Division, Form EIA-846, '2002 Manufacturing Energy Consumption Survey,' and the Bureau of the Census, data files for the '2002 Economic Census, Manufacturing - Industry Series.'

Released: September, 2008

# Table E1A. Major Fuel Consumption (Btu) by End Use for All Buildings, 2003

| | Total Major Fuel Consumption (trillion Btu) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Space Heating | Cooling | Ventilation | Water Heating | Lighting | Cooking | Refrigeration | Office Equipment | Computers | Other |
| **All Buildings** | 6,523 | 2,365 | 516 | 436 | 501 | 1,340 | 190 | 381 | 69 | 156 | 569 |
| **Building Floorspace (Square Feet)** | | | | | | | | | | | |
| 1,001 to 5,000 | 685 | 213 | 46 | 18 | 49 | 96 | 49 | 138 | 8 | 12 | 56 |
| 5,001 to 10,000 | 563 | 212 | 39 | 18 | 43 | 95 | 37 | 57 | 6 | 10 | 46 |
| 10,001 to 25,000 | 899 | 357 | 57 | 52 | 51 | 184 | 29 | 57 | 10 | 20 | 83 |
| 25,001 to 50,000 | 742 | 281 | 63 | 55 | 60 | 140 | 16 | 37 | 7 | 17 | 66 |
| 50,001 to 100,000 | 913 | 325 | 79 | 78 | 67 | 202 | 17 | 35 | 7 | 20 | 83 |
| 100,001 to 200,000 | 1,064 | 399 | 84 | 91 | 81 | 234 | 11 | 30 | Q | 33 | 89 |
| 200,001 to 500,000 | 751 | 286 | 58 | 56 | 69 | 170 | 14 | 10 | 8 | 20 | 61 |
| Over 500,000 | 906 | 292 | 91 | 67 | 81 | 220 | 18 | 19 | Q | 25 | 85 |
| **Principal Building Activity** | | | | | | | | | | | |
| Education | 820 | 389 | 79 | 83 | 57 | 113 | 8 | 16 | 4 | 32 | 39 |
| Food Sales | 251 | 36 | 12 | 7 | 4 | 46 | 11 | 119 | 2 | 2 | 11 |
| Food Service | 427 | 71 | 29 | 24 | 67 | 42 | 105 | 70 | 2 | 2 | 16 |
| Health Care | 594 | 223 | 44 | 42 | 95 | 105 | 11 | 8 | 4 | 10 | 51 |
| Inpatient | 475 | 175 | 35 | 38 | 92 | 76 | 11 | 4 | 2 | 7 | 34 |
| Outpatient | 119 | 48 | 9 | 4 | 3 | 28 | Q | 4 | 2 | 3 | 17 |
| Lodging | 510 | 113 | 25 | 14 | 160 | 124 | 16 | 12 | Q | 6 | 36 |
| Mercantile | 1,021 | 269 | 110 | 68 | 57 | 308 | 26 | 49 | 8 | 11 | 115 |
| Retail (Other Than Mall) | 319 | 107 | 25 | 16 | 5 | 111 | 3 | 22 | 3 | 4 | 24 |
| Enclosed and Strip Malls | 702 | 162 | 85 | 51 | 53 | 197 | 24 | 27 | 5 | 8 | 91 |
| Office | 1,134 | 400 | 109 | 63 | 24 | 281 | 4 | 35 | 32 | 74 | 110 |
| Public Assembly | 370 | 196 | 38 | 63 | 4 | 27 | 3 | 9 | Q | Q | 26 |
| Public Order and Safety | 126 | 54 | 10 | 10 | 15 | 18 | 1 | 3 | 1 | 2 | 12 |
| Religious Worship | 163 | 98 | 11 | 5 | 3 | 17 | 3 | 6 | (*) | 1 | 19 |
| Service | 312 | 145 | 16 | 24 | 4 | 63 | Q | 9 | 1 | 3 | 46 |
| Warehouse and Storage | 456 | 194 | 14 | 20 | 6 | 132 | Q | 36 | 2 | 5 | 48 |
| Other | 286 | 138 | 18 | 11 | 4 | 59 | Q | 10 | Q | 5 | 33 |
| Vacant | 54 | 37 | 2 | 1 | (*) | 4 | Q | Q | Q | (*) | 8 |
| **Year Constructed** | | | | | | | | | | | |
| Before 1920 | 303 | 181 | 7 | 11 | 17 | 35 | 17 | Q | 2 | 4 | 15 |
| 1920 to 1945 | 631 | 318 | 26 | 30 | 43 | 92 | 20 | 26 | 3 | 8 | 64 |
| 1946 to 1959 | 588 | 284 | 32 | 36 | 46 | 94 | 13 | 27 | 4 | 11 | 41 |
| 1960 to 1969 | 791 | 353 | 48 | 53 | 68 | 127 | 15 | 42 | 7 | 19 | 60 |
| 1970 to 1979 | 1,191 | 397 | 97 | 86 | 101 | 265 | 32 | 64 | 14 | 29 | 106 |
| 1980 to 1989 | 1,247 | 359 | 122 | 82 | 103 | 298 | 33 | 74 | 17 | 39 | 120 |
| 1990 to 1999 | 1,262 | 352 | 129 | 101 | 84 | 294 | 40 | 91 | 18 | 36 | 117 |
| 2000 to 2003 | 511 | 122 | 55 | 37 | 39 | 136 | 20 | 41 | 4 | 10 | 47 |
| **Census Region and Division** | | | | | | | | | | | |
| Northeast | 1,396 | 674 | 55 | 76 | 93 | 239 | 38 | 63 | 13 | 32 | 113 |
| New England | 345 | 186 | 10 | 15 | 20 | 55 | Q | 21 | 2 | 7 | 21 |
| Middle Atlantic | 1,052 | 488 | 45 | 60 | 74 | 184 | 31 | 42 | 11 | 25 | 92 |
| Midwest | 1,799 | 874 | 67 | 109 | 107 | 313 | 38 | 92 | 16 | 36 | 146 |
| East North Central | 1,343 | 676 | 46 | 83 | 77 | 230 | 28 | 62 | 12 | 27 | 102 |
| West North Central | 456 | 198 | 21 | 26 | 30 | 83 | 10 | 30 | 4 | 9 | 45 |
| South | 2,265 | 519 | 308 | 179 | 191 | 543 | 82 | 167 | 20 | 58 | 198 |
| South Atlantic | 1,241 | 278 | 162 | 99 | 100 | 311 | 40 | 95 | 12 | 37 | 106 |
| East South Central | 340 | 113 | 27 | 25 | 32 | 72 | 10 | 25 | 2 | 6 | 28 |
| West South Central | 684 | 128 | 119 | 54 | 59 | 160 | 31 | 47 | 6 | 15 | 64 |
| West | 1,063 | 298 | 86 | 72 | 109 | 245 | 33 | 59 | 20 | 30 | 112 |
| Mountain | 446 | 167 | 31 | 27 | 41 | 94 | 7 | 20 | Q | 9 | 43 |
| Pacific | 617 | 131 | 55 | 45 | 68 | 151 | 25 | 39 | Q | 21 | 69 |

# Table E1A. Major Fuel Consumption (Btu) by End Use for All Buildings, 2003

| | Total Major Fuel Consumption (trillion Btu) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Space Heating | Cooling | Ventilation | Water Heating | Lighting | Cooking | Refrigeration | Office Equipment | Computers | Other |
| **All Buildings** | 6,523 | 2,365 | 516 | 436 | 501 | 1,340 | 190 | 381 | 69 | 156 | 569 |
| **Climate Zone: 30-Year Average** | | | | | | | | | | | |
| Under 2,000 CDD and -- | | | | | | | | | | | |
| More than 7,000 HDD | 1,086 | 555 | 27 | 66 | 67 | 180 | 22 | 62 | 9 | 18 | 80 |
| 5,500-7,000 HDD | 1,929 | 913 | 75 | 109 | 127 | 352 | 46 | 94 | 17 | 41 | 154 |
| 4,000-5,499 HDD | 1,243 | 463 | 78 | 77 | 95 | 259 | 37 | 65 | 19 | 32 | 118 |
| Fewer than 4,000 HDD | 1,386 | 328 | 143 | 108 | 134 | 330 | 53 | 101 | 15 | 35 | 139 |
| 2,000 CDD or More and -- | | | | | | | | | | | |
| Fewer than 4,000 HDD | 879 | 106 | 193 | 76 | 78 | 219 | 32 | 59 | 8 | 29 | 79 |
| **Number of Establishments** | | | | | | | | | | | |
| One | 4,167 | 1,562 | 289 | 272 | 362 | 790 | 139 | 290 | 42 | 87 | 334 |
| 2 to 5 | 1,161 | 460 | 84 | 74 | 75 | 245 | 27 | 55 | 13 | 26 | 101 |
| 6 to 10 | 378 | 135 | 32 | 25 | 19 | 89 | 8 | 11 | 4 | 18 | 37 |
| 11 to 20 | 307 | 82 | 37 | 25 | 17 | 82 | 7 | 11 | 3 | 8 | 34 |
| More than 20 | 473 | 98 | 74 | 39 | 27 | 131 | 9 | 13 | 7 | 17 | 57 |
| Currently Unoccupied | 37 | 28 | Q | (*) | Q | 3 | Q | Q | Q | Q | 5 |
| **Energy Sources (more than one may apply)** | | | | | | | | | | | |
| Electricity | 6,522 | 2,364 | 516 | 436 | 501 | 1,340 | 190 | 381 | 69 | 156 | 569 |
| Natural Gas | 5,042 | 1,878 | 356 | 333 | 436 | 987 | 183 | 259 | 47 | 114 | 448 |
| Fuel Oil | 1,867 | 683 | 142 | 129 | 204 | 389 | 36 | 47 | 25 | 52 | 160 |
| District Heat | 1,029 | 609 | 34 | 70 | 60 | 150 | Q | 12 | 5 | 29 | 50 |
| **Energy End Uses (more than one may apply)** | | | | | | | | | | | |
| Buildings with Space Heating | 6,370 | 2,365 | 488 | 425 | 490 | 1,297 | 183 | 361 | 68 | 153 | 540 |
| Buildings with Cooling | 6,149 | 2,140 | 516 | 420 | 479 | 1,285 | 186 | 367 | 68 | 154 | 533 |
| Buildings with Water Heating | 6,158 | 2,179 | 493 | 417 | 501 | 1,262 | 190 | 362 | 67 | 152 | 535 |

See "Guide to the Tables" or "Glossary" for further explanations of the terms used in this table. Both can be accessed from the CBECS web site - http://www.eia.doe.gov/emeu/cbecs.

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

Q=Data withheld because fewer than 20 buildings were sampled for any cell, or because the Relative Standard Error (RSE) was greater than 50 percent for a cell in the "Total" column.

Note: Due to rounding, data may not sum to totals.

Source: Energy Information Administration, Office of Energy Markets and End Use, Form EIA-871A, C, and E of the 2003 Commercial Buildings Energy Consumption Survey.

Revised: December, 2008

# Table E2A. Major Fuel Consumption (Btu) Intensities by End Use for All Buildings, 2003

| | Major Fuel Energy Intensity (thousand Btu/square foot) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Space Heating | Cooling | Ventilation | Water Heating | Lighting | Cooking | Refrigeration | Office Equipment | Computers | Other |
| **All Buildings** | 91.0 | 33.0 | 7.2 | 6.1 | 7.0 | 18.7 | 2.7 | 5.3 | 1.0 | 2.2 | 7.9 |
| **Building Floorspace (Square Feet)** | | | | | | | | | | | |
| 1,001 to 5,000 | 99.0 | 30.7 | 6.7 | 2.7 | 7.1 | 13.9 | 7.1 | 19.9 | 1.1 | 1.7 | 8.2 |
| 5,001 to 10,000 | 80.0 | 30.1 | 5.5 | 2.6 | 6.1 | 13.6 | 5.2 | 8.2 | 0.8 | 1.4 | 6.6 |
| 10,001 to 25,000 | 71.0 | 28.2 | 4.5 | 4.1 | 4.1 | 14.5 | 2.3 | 4.5 | 0.8 | 1.6 | 6.5 |
| 25,001 to 50,000 | 79.0 | 29.9 | 6.8 | 5.9 | 6.3 | 14.9 | 1.7 | 3.9 | 0.8 | 1.8 | 7.1 |
| 50,001 to 100,000 | 88.7 | 31.6 | 7.6 | 7.6 | 6.5 | 19.6 | 1.7 | 3.4 | 0.7 | 2.0 | 8.1 |
| 100,001 to 200,000 | 104.2 | 39.1 | 8.2 | 8.9 | 7.9 | 22.9 | 1.1 | 2.9 | Q | 3.2 | 8.7 |
| 200,001 to 500,000 | 100.2 | 38.2 | 7.8 | 7.4 | 9.2 | 22.7 | 1.8 | 1.3 | 1.1 | 2.6 | 8.2 |
| Over 500,000 | 118.2 | 38.2 | 11.8 | 8.8 | 10.6 | 28.7 | 2.3 | 2.4 | Q | 3.2 | 11.1 |
| **Principal Building Activity** | | | | | | | | | | | |
| Education | 83.1 | 39.4 | 8.0 | 8.4 | 5.8 | 11.5 | 0.8 | 1.6 | 0.4 | 3.3 | 4.0 |
| Food Sales | 199.7 | 28.9 | 9.8 | 5.9 | 2.9 | 36.7 | 8.6 | 94.8 | 1.6 | 1.5 | 9.1 |
| Food Service | 258.3 | 43.1 | 17.4 | 14.8 | 40.4 | 25.4 | 63.5 | 42.1 | 1.0 | 1.0 | 9.5 |
| Health Care | 187.7 | 70.4 | 14.1 | 13.3 | 30.2 | 33.1 | 3.5 | 2.6 | 1.2 | 3.2 | 16.1 |
| Inpatient | 249.2 | 91.8 | 18.6 | 20.0 | 48.4 | 40.1 | 5.6 | 2.0 | 1.1 | 3.6 | 18.1 |
| Outpatient | 94.6 | 38.1 | 7.2 | 3.3 | 2.5 | 22.6 | Q | 3.5 | 1.3 | 2.6 | 13.2 |
| Lodging | 100.0 | 22.2 | 4.9 | 2.7 | 31.4 | 24.3 | 3.2 | 2.3 | Q | 1.2 | 7.0 |
| Mercantile | 91.3 | 24.0 | 9.9 | 6.0 | 5.1 | 27.5 | 2.3 | 4.4 | 0.7 | 1.0 | 10.3 |
| Retail (Other Than Mall) | 73.9 | 24.8 | 5.9 | 3.7 | 1.1 | 25.7 | 0.6 | 5.0 | 0.6 | 0.9 | 5.6 |
| Enclosed and Strip Malls | 102.2 | 23.6 | 12.4 | 7.5 | 7.7 | 28.6 | 3.4 | 4.0 | 0.8 | 1.1 | 13.2 |
| Office | 92.9 | 32.8 | 8.9 | 5.2 | 2.0 | 23.1 | 0.3 | 2.9 | 2.6 | 6.1 | 9.0 |
| Public Assembly | 93.9 | 49.7 | 9.6 | 15.9 | 1.0 | 7.0 | 0.8 | 2.2 | Q | Q | 6.5 |
| Public Order and Safety | 115.8 | 49.9 | 8.9 | 9.5 | 14.0 | 16.5 | 1.3 | 2.9 | 0.6 | 1.5 | 10.6 |
| Religious Worship | 43.5 | 26.2 | 2.9 | 1.4 | 0.8 | 4.4 | 0.8 | 1.7 | 0.1 | 0.2 | 4.9 |
| Service | 77.0 | 35.9 | 3.8 | 6.0 | 1.0 | 15.6 | Q | 2.1 | 0.3 | 0.8 | 11.4 |
| Warehouse and Storage | 45.2 | 19.3 | 1.3 | 2.0 | 0.6 | 13.1 | Q | 3.5 | 0.2 | 0.5 | 4.8 |
| Other | 164.4 | 79.4 | 10.5 | 6.1 | 2.1 | 34.1 | Q | 6.0 | Q | 2.9 | 18.9 |
| Vacant | 20.9 | 14.4 | 0.6 | 0.4 | 0.1 | 1.7 | Q | Q | Q | 0.0 | 3.1 |
| **Year Constructed** | | | | | | | | | | | |
| Before 1920 | 80.2 | 47.7 | 1.8 | 2.9 | 4.4 | 9.1 | 4.4 | 4.4 | 0.5 | 0.9 | 3.9 |
| 1920 to 1945 | 90.4 | 45.5 | 3.8 | 4.4 | 6.2 | 13.2 | 2.9 | 3.7 | 0.4 | 1.2 | 9.1 |
| 1946 to 1959 | 80.9 | 39.1 | 4.5 | 4.9 | 6.3 | 12.9 | 1.9 | 3.7 | 0.6 | 1.5 | 5.7 |
| 1960 to 1969 | 91.5 | 40.8 | 5.6 | 6.1 | 7.8 | 14.7 | 1.7 | 4.8 | 0.8 | 2.2 | 6.9 |
| 1970 to 1979 | 97.0 | 32.3 | 7.9 | 7.0 | 8.3 | 21.6 | 2.6 | 5.2 | 1.1 | 2.3 | 8.6 |
| 1980 to 1989 | 100.0 | 28.8 | 9.8 | 6.6 | 8.2 | 23.9 | 2.7 | 6.0 | 1.3 | 3.1 | 9.6 |
| 1990 to 1999 | 90.2 | 25.2 | 9.2 | 7.2 | 6.0 | 21.0 | 2.9 | 6.5 | 1.3 | 2.6 | 8.4 |
| 2000 to 2003 | 81.6 | 19.4 | 8.8 | 5.9 | 6.3 | 21.7 | 3.3 | 6.5 | 0.7 | 1.6 | 7.4 |
| **Census Region and Division** | | | | | | | | | | | |
| Northeast | 99.8 | 48.2 | 3.9 | 5.4 | 6.7 | 17.1 | 2.7 | 4.5 | 0.9 | 2.3 | 8.1 |
| New England | 99.8 | 53.9 | 3.0 | 4.5 | 5.8 | 16.0 | 1.9 | 6.0 | 0.7 | 2.0 | 6.0 |
| Middle Atlantic | 99.7 | 46.3 | 4.2 | 5.7 | 7.0 | 17.4 | 3.0 | 4.0 | 1.0 | 2.4 | 8.7 |
| Midwest | 99.4 | 48.3 | 3.7 | 6.0 | 5.9 | 17.3 | 2.1 | 5.1 | 0.9 | 2.0 | 8.1 |
| East North Central | 108.1 | 54.4 | 3.7 | 6.7 | 6.2 | 18.5 | 2.2 | 5.0 | 1.0 | 2.2 | 8.2 |
| West North Central | 80.2 | 34.8 | 3.8 | 4.6 | 5.3 | 14.6 | 1.8 | 5.3 | 0.6 | 1.6 | 7.8 |
| South | 84.7 | 19.4 | 11.5 | 6.7 | 7.1 | 20.3 | 3.1 | 6.3 | 0.8 | 2.2 | 7.4 |
| South Atlantic | 88.7 | 19.9 | 11.6 | 7.1 | 7.1 | 22.2 | 2.9 | 6.8 | 0.9 | 2.7 | 7.6 |
| East South Central | 91.4 | 30.3 | 7.2 | 6.6 | 8.6 | 19.5 | 2.7 | 6.8 | 0.6 | 1.5 | 7.6 |
| West South Central | 75.8 | 14.2 | 13.2 | 6.0 | 6.5 | 17.7 | 3.5 | 5.2 | 0.7 | 1.7 | 7.1 |
| West | 82.9 | 23.2 | 6.7 | 5.6 | 8.5 | 19.1 | 2.6 | 4.6 | 1.6 | 2.3 | 8.8 |
| Mountain | 106.1 | 39.8 | 7.4 | 6.4 | 9.7 | 22.4 | 1.8 | 4.8 | Q | 2.1 | 10.2 |
| Pacific | 71.6 | 15.2 | 6.4 | 5.2 | 7.9 | 17.5 | 2.9 | 4.5 | Q | 2.4 | 8.0 |

# Table E2A. Major Fuel Consumption (Btu) Intensities by End Use for All Buildings, 2003

| | Major Fuel Energy Intensity (thousand Btu/square foot) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Space Heating | Cooling | Ventilation | Water Heating | Lighting | Cooking | Refrigeration | Office Equipment | Computers | Other |
| **All Buildings** | 91.0 | 33.0 | 7.2 | 6.1 | 7.0 | 18.7 | 2.7 | 5.3 | 1.0 | 2.2 | 7.9 |
| **Climate Zone: 30-Year Average** | | | | | | | | | | | |
| Under 2,000 CDD and -- | | | | | | | | | | | |
| More than 7,000 HDD | 94.2 | 48.1 | 2.4 | 5.7 | 5.8 | 15.6 | 1.9 | 5.4 | 0.8 | 1.6 | 6.9 |
| 5,500-7,000 HDD | 102.6 | 48.5 | 4.0 | 5.8 | 6.8 | 18.7 | 2.5 | 5.0 | 0.9 | 2.2 | 8.2 |
| 4,000-5,499 HDD | 99.4 | 37.0 | 6.3 | 6.1 | 7.6 | 20.7 | 3.0 | 5.2 | 1.5 | 2.6 | 9.4 |
| Fewer than 4,000 HDD | 78.6 | 18.6 | 8.1 | 6.1 | 7.6 | 18.7 | 3.0 | 5.7 | 0.9 | 2.0 | 7.9 |
| 2,000 CDD or More and -- | | | | | | | | | | | |
| Fewer than 4,000 HDD | 78.6 | 9.5 | 17.3 | 6.8 | 6.9 | 19.5 | 2.9 | 5.3 | 0.8 | 2.6 | 7.0 |
| **Number of Establishments** | | | | | | | | | | | |
| One | 92.3 | 34.6 | 6.4 | 6.0 | 8.0 | 17.5 | 3.1 | 6.4 | 0.9 | 1.9 | 7.4 |
| 2 to 5 | 92.4 | 36.6 | 6.6 | 5.9 | 6.0 | 19.5 | 2.1 | 4.4 | 1.1 | 2.1 | 8.1 |
| 6 to 10 | 112.6 | 40.1 | 9.4 | 7.5 | 5.7 | 26.6 | 2.5 | 3.3 | 1.2 | 5.3 | 11.1 |
| 11 to 20 | 91.1 | 24.3 | 11.0 | 7.5 | 5.1 | 24.3 | 2.0 | 3.3 | 1.0 | 2.4 | 10.2 |
| More than 20 | 93.4 | 19.4 | 14.6 | 7.8 | 5.4 | 26.0 | 1.7 | 2.7 | 1.3 | 3.4 | 11.2 |
| Currently Unoccupied | 17.2 | 12.8 | Q | 0.1 | (*) | 1.2 | Q | Q | Q | Q | 2.3 |
| **Energy Sources (more than one may apply)** | | | | | | | | | | | |
| Electricity | 92.9 | 33.7 | 7.4 | 6.2 | 7.1 | 19.1 | 2.7 | 5.4 | 1.0 | 2.2 | 8.1 |
| Natural Gas | 104.0 | 38.7 | 7.3 | 6.9 | 9.0 | 20.4 | 3.8 | 5.3 | 1.0 | 2.4 | 9.2 |
| Fuel Oil | 114.8 | 42.0 | 8.7 | 8.0 | 12.5 | 23.9 | 2.2 | 2.9 | 1.5 | 3.2 | 9.8 |
| District Heat | 184.6 | 109.3 | 6.0 | 12.6 | 10.8 | 26.9 | Q | 2.2 | 0.8 | 5.3 | 8.9 |
| **Energy End Uses (more than one may apply)** | | | | | | | | | | | |
| Buildings with Space Heating | 95.9 | 35.6 | 7.3 | 6.4 | 7.4 | 19.5 | 2.8 | 5.4 | 1.0 | 2.3 | 8.1 |
| Buildings with Cooling | 96.7 | 33.7 | 8.1 | 6.6 | 7.5 | 20.2 | 2.9 | 5.8 | 1.1 | 2.4 | 8.4 |
| Buildings with Water Heating | 98.0 | 34.7 | 7.8 | 6.6 | 8.0 | 20.1 | 3.0 | 5.8 | 1.1 | 2.4 | 8.5 |

See "Guide to the Tables" or "Glossary" for further explanations of the terms used in this table. Both can be accessed from the CBECS web site - http://www.eia.doe.gov/emeu/cbecs.

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

Q=Data withheld because fewer than 20 buildings were sampled for any cell, or because the Relative Standard Error (RSE) was greater than 50 percent for a cell in the "Total" column.

Note: Due to rounding, data may not sum to totals.

Source: Energy Information Administration, Office of Energy Markets and End Use, Form EIA-871A, C, and E of the 2003 Commercial Buildings Energy Consumption Survey.

Released: September, 2008

# Table E3A. Electricity Consumption (Btu) by End Use for All Buildings, 2003

| | Total Electricity Consumption (trillion Btu) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Space Heating | Cooling | Ventilation | Water Heating | Lighting | Cooking | Refrigeration | Office Equipment | Computers | Other |
| **All Buildings** | 3,559 | 167 | 481 | 436 | 88 | 1,340 | 24 | 381 | 69 | 156 | 418 |
| **Building Floorspace (Square Feet)** | | | | | | | | | | | |
| 1,001 to 5,000 | 392 | 19 | 44 | 18 | 11 | 96 | 7 | 138 | 8 | 12 | 39 |
| 5,001 to 10,000 | 293 | 18 | 38 | 18 | 8 | 95 | 4 | 57 | 6 | 10 | 39 |
| 10,001 to 25,000 | 485 | 26 | 55 | 52 | 14 | 184 | 3 | 57 | 10 | 20 | 63 |
| 25,001 to 50,000 | 397 | 18 | 62 | 55 | 12 | 140 | 2 | 37 | 7 | 17 | 48 |
| 50,001 to 100,000 | 523 | 28 | 77 | 78 | 15 | 202 | 3 | 35 | 7 | 20 | 59 |
| 100,001 to 200,000 | 587 | 23 | 82 | 91 | 11 | 234 | 1 | 30 | 14 | 33 | 68 |
| 200,001 to 500,000 | 381 | 11 | 55 | 56 | 6 | 170 | 2 | 10 | 8 | 20 | 46 |
| Over 500,000 | 501 | 23 | 69 | 67 | 12 | 220 | 2 | 19 | 9 | 25 | 56 |
| **Principal Building Activity** | | | | | | | | | | | |
| Education | 371 | 15 | 74 | 83 | 11 | 113 | 2 | 16 | 4 | 32 | 21 |
| Food Sales | 208 | 6 | 12 | 7 | Q | 46 | 2 | 119 | 2 | 2 | 10 |
| Food Service | 217 | 10 | 28 | 24 | 10 | 42 | 13 | 70 | 2 | 2 | 15 |
| Health Care | 248 | 6 | 34 | 42 | 2 | 105 | 1 | 8 | 4 | 10 | 36 |
| Inpatient | 178 | 3 | 25 | 38 | 2 | 76 | 1 | 4 | 2 | 7 | 21 |
| Outpatient | 69 | 3 | 9 | 4 | (*) | 28 | (*) | 4 | 2 | 3 | 15 |
| Lodging | 235 | 14 | 24 | 14 | 12 | 124 | 2 | 12 | Q | 6 | 24 |
| Mercantile | 733 | 58 | 109 | 68 | 38 | 308 | 2 | 49 | 8 | 11 | 83 |
| Retail (Other Than Mall) | 211 | 6 | 25 | 16 | 2 | 111 | (*) | 22 | 3 | 4 | 22 |
| Enclosed and Strip Malls | 523 | 52 | 84 | 51 | 36 | 197 | 2 | 27 | 5 | 8 | 61 |
| Office | 719 | 33 | 101 | 63 | 7 | 281 | 1 | 35 | 32 | 74 | 91 |
| Public Assembly | 167 | 5 | 35 | 63 | (*) | 27 | (*) | 9 | Q | 3 | 23 |
| Public Order and Safety | 57 | 2 | 8 | 10 | 3 | 18 | (*) | 3 | 1 | 2 | 10 |
| Religious Worship | 62 | 3 | 11 | 5 | (*) | 17 | (*) | 6 | (*) | 1 | 18 |
| Service | 149 | 6 | 15 | 24 | (*) | 63 | Q | 9 | 1 | 3 | 28 |
| Warehouse and Storage | 244 | 5 | 13 | 20 | 2 | 132 | Q | 36 | 2 | 5 | 30 |
| Other | 133 | 2 | 16 | 11 | Q | 59 | Q | 10 | Q | 5 | 22 |
| Vacant | 15 | 1 | 2 | 1 | Q | 4 | Q | (*) | Q | (*) | 7 |
| **Year Constructed** | | | | | | | | | | | |
| Before 1920 | 91 | 2 | 6 | 11 | Q | 35 | 1 | 17 | 2 | 4 | 12 |
| 1920 to 1945 | 215 | 4 | 17 | 30 | 2 | 92 | 1 | 26 | 3 | 8 | 31 |
| 1946 to 1959 | 247 | 11 | 28 | 36 | 5 | 94 | 2 | 27 | 4 | 11 | 30 |
| 1960 to 1969 | 359 | 13 | 47 | 53 | 7 | 127 | 1 | 42 | 7 | 19 | 43 |
| 1970 to 1979 | 689 | 40 | 89 | 86 | 18 | 265 | 4 | 64 | 14 | 29 | 80 |
| 1980 to 1989 | 789 | 42 | 118 | 82 | 24 | 298 | 5 | 74 | 17 | 39 | 91 |
| 1990 to 1999 | 823 | 37 | 123 | 101 | 22 | 294 | 7 | 91 | 18 | 36 | 93 |
| 2000 to 2003 | 347 | 17 | 54 | 37 | 7 | 136 | 3 | 41 | 4 | 10 | 38 |
| **Census Region and Division** | | | | | | | | | | | |
| Northeast | 587 | 33 | 43 | 76 | 12 | 239 | 3 | 63 | 13 | 32 | 73 |
| New England | 141 | 10 | 8 | 15 | 4 | 55 | 1 | 21 | 2 | 7 | 17 |
| Middle Atlantic | 446 | 23 | 35 | 60 | 8 | 184 | 2 | 42 | 11 | 25 | 57 |
| Midwest | 799 | 53 | 57 | 109 | 15 | 313 | 5 | 92 | 16 | 36 | 103 |
| East North Central | 574 | 33 | 38 | 83 | 10 | 230 | 4 | 62 | 12 | 27 | 74 |
| West North Central | 225 | 20 | 19 | 26 | 5 | 83 | 1 | 30 | 4 | 9 | 28 |
| South | 1,542 | 51 | 299 | 179 | 47 | 543 | 13 | 167 | 20 | 58 | 164 |
| South Atlantic | 865 | 31 | 154 | 99 | 29 | 311 | 8 | 95 | 12 | 37 | 88 |
| East South Central | 196 | 9 | 26 | 25 | 5 | 72 | 1 | 25 | 2 | 6 | 24 |
| West South Central | 481 | 11 | 118 | 54 | 13 | 160 | 4 | 47 | 6 | 15 | 52 |
| West | 631 | 29 | 82 | 72 | 14 | 245 | 3 | 59 | 20 | 30 | 77 |
| Mountain | 232 | 13 | 31 | 27 | 5 | 94 | Q | 20 | Q | 9 | 27 |
| Pacific | 399 | 17 | 51 | 45 | 9 | 151 | 2 | 39 | 14 | 21 | 50 |

# Table E3A. Electricity Consumption (Btu) by End Use for All Buildings, 2003

| | Total Electricity Consumption (trillion Btu) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Space Heating | Cooling | Ventilation | Water Heating | Lighting | Cooking | Refrigeration | Office Equipment | Computers | Other |
| **All Buildings** | 3,559 | 167 | 481 | 436 | 88 | 1,340 | 24 | 381 | 69 | 156 | 418 |
| **Climate Zone: 30-Year Average** | | | | | | | | | | | |
| Under 2,000 CDD and -- | | | | | | | | | | | |
| More than 7,000 HDD | 468 | 35 | 26 | 66 | 9 | 180 | 3 | 62 | 9 | 18 | 59 |
| 5,500-7,000 HDD | 868 | 58 | 63 | 109 | 18 | 352 | 6 | 94 | 17 | 41 | 110 |
| 4,000-5,499 HDD | 645 | 35 | 66 | 77 | 14 | 259 | 3 | 65 | 19 | 32 | 75 |
| Fewer than 4,000 HDD | 890 | 26 | 136 | 108 | 27 | 330 | 7 | 101 | 15 | 35 | 105 |
| 2,000 CDD or More and -- | | | | | | | | | | | |
| Fewer than 4,000 HDD | 689 | 13 | 190 | 76 | 21 | 219 | 5 | 59 | 8 | 29 | 70 |
| **Number of Establishments** | | | | | | | | | | | |
| One | 2,138 | 82 | 272 | 272 | 43 | 790 | 19 | 290 | 42 | 87 | 242 |
| 2 to 5 | 616 | 27 | 80 | 74 | 14 | 245 | 3 | 55 | 13 | 26 | 78 |
| 6 to 10 | 229 | 16 | 30 | 25 | 9 | 89 | 1 | 11 | 4 | Q | 27 |
| 11 to 20 | 217 | 16 | 36 | 25 | 9 | 82 | (*) | 11 | 3 | 8 | 27 |
| More than 20 | 350 | 25 | 63 | 39 | 13 | 131 | 1 | 13 | 7 | 17 | 39 |
| Currently Unoccupied | 9 | Q | Q | (*) | Q | 3 | Q | Q | Q | Q | 5 |
| **Energy Sources (more than one may apply)** | | | | | | | | | | | |
| Electricity | 3,559 | 167 | 481 | 436 | 88 | 1,340 | 24 | 381 | 69 | 156 | 418 |
| Natural Gas | 2,534 | 103 | 323 | 333 | 51 | 987 | 18 | 259 | 47 | 114 | 300 |
| Fuel Oil | 937 | 40 | 122 | 129 | 18 | 389 | 4 | 47 | 25 | 52 | 111 |
| District Heat | 344 | 5 | 25 | 70 | 4 | 150 | 1 | 12 | 5 | 29 | 43 |
| **Energy End Uses (more than one may apply)** | | | | | | | | | | | |
| Buildings with Space Heating | 3,433 | 167 | 453 | 425 | 86 | 1,297 | 23 | 361 | 68 | 153 | 402 |
| Buildings with Cooling | 3,445 | 163 | 481 | 420 | 87 | 1,285 | 24 | 367 | 68 | 154 | 396 |
| Buildings with Water Heating | 3,379 | 160 | 458 | 417 | 88 | 1,262 | 24 | 362 | 67 | 152 | 389 |
| **Annual Consumption (kilowatthours)** | | | | | | | | | | | |
| 10,000 or Less | 13 | (*) | 1 | 1 | (*) | 4 | (*) | 2 | (*) | (*) | 4 |
| 10,001 to 50,000 | 155 | 8 | 19 | 10 | 2 | 55 | (*) | 22 | 3 | 5 | 29 |
| 50,001 to 100,000 | 187 | 10 | 23 | 14 | 4 | 60 | 1 | 36 | 4 | 6 | 28 |
| 100,001 to 500,000 | 812 | 46 | 94 | 80 | 23 | 270 | 11 | 151 | 15 | 29 | 94 |
| 500,001 to 1,000,000 | 376 | 17 | 57 | 49 | 13 | 134 | 3 | 45 | 6 | 14 | 39 |
| 1,000,001 to 5,000,000 | 1,137 | 54 | 162 | 168 | 29 | 428 | 5 | 89 | 19 | 58 | 125 |
| Over 5,000,000 | 880 | 33 | 124 | 114 | 17 | 388 | 3 | 35 | 22 | 44 | 99 |

See "Guide to the Tables" or "Glossary" for further explanations of the terms used in this table. Both can be accessed from the CBECS web site - http://www.eia.doe.gov/emeu/cbecs.

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

Q=Data withheld because fewer than 20 buildings were sampled for any cell, or because the Relative Standard Error (RSE) was greater than 50 percent for a cell in the "Total" column.

Note: Due to rounding, data may not sum to totals.

Source: Energy Information Administration, Office of Energy Markets and End Use, Form EIA-871A, C, and E of the 2003 Commercial Buildings Energy Consumption Survey.

Released: September, 2008

# Table E4A. Electricity Consumption (Btu) Intensities by End Use for All Buildings, 2003

| | Electricity Energy Intensity (thousand Btu/square foot) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Space Heating | Cooling | Ventilation | Water Heating | Lighting | Cooking | Refrigeration | Office Equipment | Computers | Other |
| **All Buildings** | 50.7 | 2.4 | 6.9 | 6.2 | 1.3 | 19.1 | 0.3 | 5.4 | 1.0 | 2.2 | 6.0 |
| **Building Floorspace (Square Feet)** | | | | | | | | | | | |
| 1,001 to 5,000 | 60.6 | 2.9 | 6.8 | 2.8 | 1.7 | 14.8 | 1.1 | 21.2 | 1.2 | 1.8 | 6.0 |
| 5,001 to 10,000 | 44.0 | 2.6 | 5.7 | 2.8 | 1.1 | 14.3 | 0.7 | 8.6 | 0.9 | 1.4 | 5.8 |
| 10,001 to 25,000 | 38.8 | 2.1 | 4.4 | 4.1 | 1.1 | 14.7 | 0.2 | 4.5 | 0.8 | 1.6 | 5.1 |
| 25,001 to 50,000 | 43.7 | 2.0 | 6.8 | 6.1 | 1.3 | 15.4 | 0.2 | 4.0 | 0.8 | 1.9 | 5.3 |
| 50,001 to 100,000 | 50.9 | 2.7 | 7.5 | 7.6 | 1.4 | 19.6 | 0.3 | 3.4 | 0.7 | 2.0 | 5.8 |
| 100,001 to 200,000 | 57.7 | 2.3 | 8.0 | 8.9 | 1.1 | 23.0 | 0.1 | 2.9 | 1.3 | 3.2 | 6.7 |
| 200,001 to 500,000 | 51.8 | 1.5 | 7.4 | 7.5 | 0.8 | 23.0 | 0.2 | 1.3 | 1.1 | 2.7 | 6.2 |
| Over 500,000 | 65.4 | 3.0 | 9.0 | 8.8 | 1.5 | 28.7 | 0.3 | 2.4 | 1.2 | 3.2 | 7.3 |
| **Principal Building Activity** | | | | | | | | | | | |
| Education | 37.6 | 1.5 | 7.5 | 8.4 | 1.1 | 11.5 | 0.2 | 1.6 | 0.4 | 3.3 | 2.1 |
| Food Sales | 168.5 | 5.1 | 9.9 | 6.0 | Q | 37.2 | 1.9 | 96.1 | 1.6 | 1.5 | 8.1 |
| Food Service | 130.9 | 6.3 | 17.0 | 14.8 | 6.3 | 25.4 | 8.1 | 42.1 | 1.0 | 1.0 | 8.9 |
| Health Care | 78.3 | 1.9 | 10.6 | 13.3 | 0.8 | 33.1 | 0.2 | 2.6 | 1.2 | 3.2 | 11.3 |
| Inpatient | 93.7 | 1.6 | 13.0 | 20.0 | 1.1 | 40.1 | 0.4 | 2.0 | 1.1 | 3.6 | 10.9 |
| Outpatient | 55.0 | 2.3 | 7.0 | 3.3 | 0.3 | 22.6 | 0.1 | 3.5 | 1.3 | 2.6 | 12.0 |
| Lodging | 46.1 | 2.8 | 4.7 | 2.7 | 2.3 | 24.3 | 0.4 | 2.3 | Q | 1.2 | 4.7 |
| Mercantile | 65.5 | 5.2 | 9.7 | 6.0 | 3.4 | 27.5 | 0.2 | 4.4 | 0.7 | 1.0 | 7.4 |
| Retail (Other Than Mall) | 48.8 | 1.5 | 5.9 | 3.7 | 0.4 | 25.7 | 0.1 | 5.0 | 0.6 | 0.9 | 5.1 |
| Enclosed and Strip Malls | 76.0 | 7.5 | 12.2 | 7.5 | 5.2 | 28.6 | 0.3 | 4.0 | 0.8 | 1.1 | 8.8 |
| Office | 58.9 | 2.7 | 8.3 | 5.2 | 0.6 | 23.1 | 0.1 | 2.9 | 2.6 | 6.1 | 7.5 |
| Public Assembly | 42.6 | 1.3 | 8.9 | 15.9 | 0.1 | 7.0 | 0.1 | 2.2 | Q | 0.8 | 5.8 |
| Public Order and Safety | 52.3 | 1.6 | 7.2 | 9.5 | 3.0 | 16.5 | 0.1 | 2.9 | 0.6 | 1.5 | 9.2 |
| Religious Worship | 16.6 | 0.8 | 2.8 | 1.4 | 0.1 | 4.4 | 0.1 | 1.7 | 0.1 | 0.2 | 4.9 |
| Service | 37.5 | 1.4 | 3.8 | 6.1 | 0.1 | 15.8 | Q | 2.2 | 0.3 | 0.8 | 7.0 |
| Warehouse and Storage | 25.9 | 0.5 | 1.4 | 2.2 | 0.2 | 14.0 | Q | 3.8 | 0.2 | 0.5 | 3.2 |
| Other | 76.8 | 1.4 | 9.3 | 6.1 | 0.3 | 34.3 | Q | 6.0 | Q | 2.9 | 12.6 |
| Vacant | 8.3 | 0.5 | 0.8 | 0.5 | Q | 2.4 | Q | 0.2 | Q | 0.1 | 3.7 |
| **Year Constructed** | | | | | | | | | | | |
| Before 1920 | 24.2 | 0.5 | 1.7 | 2.9 | Q | 9.2 | 0.3 | 4.5 | 0.6 | 0.9 | 3.2 |
| 1920 to 1945 | 32.1 | 0.7 | 2.5 | 4.5 | 0.4 | 13.8 | 0.2 | 3.9 | 0.4 | 1.2 | 4.6 |
| 1946 to 1959 | 35.0 | 1.5 | 4.0 | 5.1 | 0.8 | 13.3 | 0.3 | 3.8 | 0.6 | 1.6 | 4.2 |
| 1960 to 1969 | 41.8 | 1.6 | 5.4 | 6.2 | 0.9 | 14.8 | 0.1 | 4.8 | 0.8 | 2.2 | 5.0 |
| 1970 to 1979 | 57.1 | 3.3 | 7.4 | 7.1 | 1.5 | 22.0 | 0.3 | 5.3 | 1.1 | 2.4 | 6.7 |
| 1980 to 1989 | 64.2 | 3.4 | 9.6 | 6.7 | 2.0 | 24.2 | 0.4 | 6.0 | 1.4 | 3.2 | 7.4 |
| 1990 to 1999 | 60.1 | 2.7 | 9.0 | 7.3 | 1.6 | 21.4 | 0.5 | 6.7 | 1.3 | 2.7 | 6.8 |
| 2000 to 2003 | 57.6 | 2.9 | 8.9 | 6.2 | 1.2 | 22.5 | 0.5 | 6.7 | 0.7 | 1.6 | 6.3 |
| **Census Region and Division** | | | | | | | | | | | |
| Northeast | 42.2 | 2.4 | 3.1 | 5.5 | 0.9 | 17.2 | 0.2 | 4.5 | 0.9 | 2.3 | 5.3 |
| New England | 41.1 | 2.9 | 2.4 | 4.5 | 1.3 | 16.1 | 0.3 | 6.1 | 0.7 | 2.0 | 4.9 |
| Middle Atlantic | 42.6 | 2.2 | 3.4 | 5.8 | 0.7 | 17.5 | 0.1 | 4.0 | 1.0 | 2.4 | 5.4 |
| Midwest | 45.1 | 3.0 | 3.2 | 6.2 | 0.9 | 17.7 | 0.3 | 5.2 | 0.9 | 2.0 | 5.8 |
| East North Central | 47.0 | 2.7 | 3.1 | 6.8 | 0.8 | 18.9 | 0.3 | 5.1 | 1.0 | 2.2 | 6.1 |
| West North Central | 40.8 | 3.6 | 3.4 | 4.8 | 0.9 | 15.0 | 0.2 | 5.4 | 0.7 | 1.6 | 5.1 |
| South | 59.3 | 2.0 | 11.5 | 6.9 | 1.8 | 20.9 | 0.5 | 6.4 | 0.8 | 2.2 | 6.3 |
| South Atlantic | 62.5 | 2.2 | 11.1 | 7.2 | 2.1 | 22.5 | 0.6 | 6.9 | 0.9 | 2.7 | 6.4 |
| East South Central | 55.2 | 2.4 | 7.5 | 6.9 | 1.5 | 20.4 | Q | 7.1 | 0.6 | 1.6 | 6.8 |
| West South Central | 55.7 | 1.3 | 13.7 | 6.3 | 1.5 | 18.5 | 0.4 | 5.5 | 0.7 | 1.7 | 6.0 |
| West | 50.3 | 2.3 | 6.5 | 5.7 | 1.1 | 19.5 | 0.3 | 4.7 | 1.6 | 2.4 | 6.2 |
| Mountain | 55.7 | 3.1 | 7.3 | 6.5 | 1.1 | 22.6 | 0.2 | 4.8 | Q | 2.2 | 6.4 |
| Pacific | 47.7 | 2.0 | 6.1 | 5.4 | 1.1 | 18.0 | 0.3 | 4.6 | 1.7 | 2.5 | 6.0 |

# Table E4A. Electricity Consumption (Btu) Intensities by End Use for All Buildings, 2003

| | Electricity Energy Intensity (thousand Btu/square foot) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Space Heating | Cooling | Ventilation | Water Heating | Lighting | Cooking | Refrigeration | Office Equipment | Computers | Other |
| **All Buildings** | 50.7 | 2.4 | 6.9 | 6.2 | 1.3 | 19.1 | 0.3 | 5.4 | 1.0 | 2.2 | 6.0 |
| **Climate Zone: 30-Year Average** | | | | | | | | | | | |
| Under 2,000 CDD and -- | | | | | | | | | | | |
| More than 7,000 HDD | 41.4 | 3.1 | 2.3 | 5.9 | 0.8 | 16.0 | 0.2 | 5.5 | 0.8 | 1.6 | 5.3 |
| 5,500-7,000 HDD | 46.8 | 3.1 | 3.4 | 5.9 | 1.0 | 19.0 | 0.3 | 5.1 | 0.9 | 2.2 | 5.9 |
| 4,000-5,499 HDD | 52.1 | 2.9 | 5.3 | 6.2 | 1.1 | 20.9 | 0.3 | 5.3 | 1.5 | 2.6 | 6.0 |
| Fewer than 4,000 HDD | 52.1 | 1.5 | 8.0 | 6.3 | 1.6 | 19.4 | 0.4 | 5.9 | 0.9 | 2.1 | 6.1 |
| 2,000 CDD or More and -- | | | | | | | | | | | |
| Fewer than 4,000 HDD | 63.3 | 1.2 | 17.5 | 7.0 | 1.9 | 20.1 | 0.5 | 5.4 | 0.8 | 2.7 | 6.4 |
| **Number of Establishments** | | | | | | | | | | | |
| One | 48.2 | 1.8 | 6.1 | 6.1 | 1.0 | 17.8 | 0.4 | 6.5 | 0.9 | 2.0 | 5.5 |
| 2 to 5 | 49.2 | 2.2 | 6.4 | 5.9 | 1.1 | 19.6 | 0.2 | 4.4 | 1.1 | 2.1 | 6.2 |
| 6 to 10 | 68.3 | 4.6 | 8.9 | 7.5 | 2.8 | 26.6 | 0.2 | 3.3 | 1.2 | 5.3 | 8.0 |
| 11 to 20 | 64.5 | 4.8 | 10.6 | 7.5 | 2.6 | 24.3 | 0.1 | 3.3 | 1.0 | 2.4 | 8.1 |
| More than 20 | 69.1 | 4.9 | 12.4 | 7.8 | 2.7 | 26.0 | 0.3 | 2.7 | 1.3 | 3.4 | 7.8 |
| Currently Unoccupied | 6.2 | Q | Q | 0.2 | Q | 1.7 | Q | Q | Q | Q | 3.1 |
| **Energy Sources (more than one may apply)** | | | | | | | | | | | |
| Electricity | 50.7 | 2.4 | 6.9 | 6.2 | 1.3 | 19.1 | 0.3 | 5.4 | 1.0 | 2.2 | 6.0 |
| Natural Gas | 52.3 | 2.1 | 6.7 | 6.9 | 1.1 | 20.4 | 0.4 | 5.3 | 1.0 | 2.4 | 6.2 |
| Fuel Oil | 57.7 | 2.4 | 7.5 | 8.0 | 1.1 | 23.9 | 0.3 | 2.9 | 1.5 | 3.2 | 6.8 |
| District Heat | 61.8 | 0.9 | 4.5 | 12.6 | 0.7 | 26.9 | 0.2 | 2.2 | 0.8 | 5.3 | 7.7 |
| **Energy End Uses (more than one may apply)** | | | | | | | | | | | |
| Buildings with Space Heating | 51.7 | 2.5 | 6.8 | 6.4 | 1.3 | 19.5 | 0.3 | 5.4 | 1.0 | 2.3 | 6.1 |
| Buildings with Cooling | 54.2 | 2.6 | 7.6 | 6.6 | 1.4 | 20.2 | 0.4 | 5.8 | 1.1 | 2.4 | 6.2 |
| Buildings with Water Heating | 53.8 | 2.5 | 7.3 | 6.6 | 1.4 | 20.1 | 0.4 | 5.8 | 1.1 | 2.4 | 6.2 |
| **Annual Consumption (kilowatthours)** | | | | | | | | | | | |
| 10,000 or Less | 4.6 | 0.1 | 0.4 | 0.3 | (*) | 1.5 | (*) | 0.7 | (*) | 0.1 | 1.4 |
| 10,001 to 50,000 | 16.7 | 0.8 | 2.1 | 1.1 | 0.3 | 6.0 | (*) | 2.4 | 0.4 | 0.5 | 3.1 |
| 50,001 to 100,000 | 27.8 | 1.4 | 3.5 | 2.1 | 0.6 | 9.0 | 0.2 | 5.3 | 0.6 | 0.9 | 4.2 |
| 100,001 to 500,000 | 46.1 | 2.6 | 5.4 | 4.5 | 1.3 | 15.3 | 0.6 | 8.6 | 0.8 | 1.6 | 5.3 |
| 500,001 to 1,000,000 | 51.0 | 2.2 | 7.8 | 6.6 | 1.7 | 18.2 | 0.5 | 6.1 | 0.8 | 1.9 | 5.3 |
| 1,000,001 to 5,000,000 | 72.8 | 3.5 | 10.4 | 10.8 | 1.9 | 27.4 | 0.3 | 5.7 | 1.2 | 3.7 | 8.0 |
| Over 5,000,000 | 81.9 | 3.1 | 11.5 | 10.6 | 1.6 | 36.1 | 0.3 | 3.3 | 2.1 | 4.1 | 9.3 |

See "Guide to the Tables" or "Glossary" for further explanations of the terms used in this table. Both can be accessed from the CBECS web site - http://www.eia.doe.gov/emeu/cbecs.

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

Q=Data withheld because fewer than 20 buildings were sampled for any cell, or because the Relative Standard Error (RSE) was greater than 50 percent for a cell in the "Total" column.

Note: Due to rounding, data may not sum to totals.

Source: Energy Information Administration, Office of Energy Markets and End Use, Form EIA-871A, C, and E of the 2003 Commercial Buildings Energy Consumption Survey.

Released: September, 2008

# Table E5A. Electricity Consumption (kWh) by End Use for All Buildings, 2003

| | Total Electricity Consumption (billion kWh) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Space Heating | Cooling | Ventilation | Water Heating | Lighting | Cooking | Refrigeration | Office Equipment | Computers | Other |
| **All Buildings** | 1,043 | 49 | 141 | 128 | 26 | 393 | 7 | 112 | 20 | 46 | 122 |
| **Building Floorspace (Square Feet)** | | | | | | | | | | | |
| 1,001 to 5,000 | 115 | 6 | 13 | 5 | 3 | 28 | 2 | 40 | 2 | 3 | 11 |
| 5,001 to 10,000 | 86 | 5 | 11 | 5 | 2 | 28 | 1 | 17 | 2 | 3 | 11 |
| 10,001 to 25,000 | 142 | 8 | 16 | 15 | 4 | 54 | 1 | 17 | 3 | 6 | 19 |
| 25,001 to 50,000 | 116 | 5 | 18 | 16 | 3 | 41 | (*) | 11 | 2 | 5 | 14 |
| 50,001 to 100,000 | 153 | 8 | 22 | 23 | 4 | 59 | 1 | 10 | 2 | 6 | 17 |
| 100,001 to 200,000 | 172 | 7 | 24 | 27 | 3 | 68 | (*) | 9 | 4 | 10 | 20 |
| 200,001 to 500,000 | 112 | 3 | 16 | 16 | 2 | 50 | (*) | 3 | 2 | 6 | 13 |
| Over 500,000 | 147 | 7 | 20 | 20 | 3 | 64 | 1 | 5 | 3 | 7 | 16 |
| **Principal Building Activity** | | | | | | | | | | | |
| Education | 109 | 4 | 22 | 24 | 3 | 33 | (*) | 5 | 1 | 9 | 6 |
| Food Sales | 61 | 2 | 4 | 2 | Q | 14 | 1 | 35 | 1 | 1 | 3 |
| Food Service | 63 | 3 | 8 | 7 | 3 | 12 | 4 | 20 | (*) | 1 | 4 |
| Health Care | 73 | 2 | 10 | 12 | 1 | 31 | (*) | 2 | 1 | 3 | 11 |
| Inpatient | 52 | 1 | 7 | 11 | 1 | 22 | (*) | 1 | 1 | 2 | 6 |
| Outpatient | 20 | 1 | 3 | 1 | (*) | 8 | (*) | 1 | (*) | 1 | 4 |
| Lodging | 69 | 4 | 7 | 4 | 3 | 36 | 1 | 3 | Q | 2 | 7 |
| Mercantile | 215 | 17 | 32 | 20 | 11 | 90 | 1 | 14 | 2 | 3 | 24 |
| Retail (Other Than Mall) | 62 | 2 | 7 | 5 | 1 | 33 | (*) | 6 | 1 | 1 | 6 |
| Enclosed and Strip Malls | 153 | 15 | 25 | 15 | 11 | 58 | 1 | 8 | 2 | 2 | 18 |
| Office | 211 | 10 | 30 | 18 | 2 | 82 | (*) | 10 | 9 | 22 | 27 |
| Public Assembly | 49 | 1 | 10 | 18 | (*) | 8 | (*) | 3 | Q | 1 | 7 |
| Public Order and Safety | 17 | 1 | 2 | 3 | 1 | 5 | (*) | 1 | (*) | (*) | 3 |
| Religious Worship | 18 | 1 | 3 | 2 | (*) | 5 | (*) | 2 | (*) | (*) | 5 |
| Service | 44 | 2 | 4 | 7 | (*) | 18 | Q | 3 | (*) | 1 | 8 |
| Warehouse and Storage | 72 | 1 | 4 | 6 | 1 | 39 | Q | 10 | 1 | 1 | 9 |
| Other | 39 | 1 | 5 | 3 | Q | 17 | Q | 3 | Q | 1 | 6 |
| Vacant | 4 | (*) | (*) | (*) | Q | 1 | Q | (*) | Q | (*) | 2 |
| **Year Constructed** | | | | | | | | | | | |
| Before 1920 | 27 | 1 | 2 | 3 | Q | 10 | (*) | 5 | 1 | 1 | 4 |
| 1920 to 1945 | 63 | 1 | 5 | 9 | 1 | 27 | (*) | 8 | 1 | 2 | 9 |
| 1946 to 1959 | 72 | 3 | 8 | 10 | 2 | 27 | 1 | 8 | 1 | 3 | 9 |
| 1960 to 1969 | 105 | 4 | 14 | 16 | 2 | 37 | (*) | 12 | 2 | 6 | 13 |
| 1970 to 1979 | 202 | 12 | 26 | 25 | 5 | 78 | 1 | 19 | 4 | 8 | 24 |
| 1980 to 1989 | 231 | 12 | 34 | 24 | 7 | 87 | 1 | 22 | 5 | 11 | 27 |
| 1990 to 1999 | 241 | 11 | 36 | 29 | 7 | 86 | 2 | 27 | 5 | 11 | 27 |
| 2000 to 2003 | 102 | 5 | 16 | 11 | 2 | 40 | 1 | 12 | 1 | 3 | 11 |
| **Census Region and Division** | | | | | | | | | | | |
| Northeast | 172 | 10 | 13 | 22 | 3 | 70 | 1 | 18 | 4 | 9 | 22 |
| New England | 41 | 3 | 2 | 5 | 1 | 16 | (*) | 6 | 1 | 2 | 5 |
| Middle Atlantic | 131 | 7 | 10 | 18 | 2 | 54 | (*) | 12 | 3 | 7 | 17 |
| Midwest | 234 | 15 | 17 | 32 | 4 | 92 | 2 | 27 | 5 | 11 | 30 |
| East North Central | 168 | 10 | 11 | 24 | 3 | 67 | 1 | 18 | 3 | 8 | 22 |
| West North Central | 66 | 6 | 6 | 8 | 1 | 24 | (*) | 9 | 1 | 3 | 8 |
| South | 452 | 15 | 88 | 52 | 14 | 159 | 4 | 49 | 6 | 17 | 48 |
| South Atlantic | 254 | 9 | 45 | 29 | 9 | 91 | 2 | 28 | 4 | 11 | 26 |
| East South Central | 57 | 3 | 8 | 7 | 2 | 21 | (*) | 7 | 1 | 2 | 7 |
| West South Central | 141 | 3 | 35 | 16 | 4 | 47 | 1 | 14 | 2 | 4 | 15 |
| West | 185 | 9 | 24 | 21 | 4 | 72 | 1 | 17 | 6 | 9 | 23 |
| Mountain | 68 | 4 | 9 | 8 | 1 | 28 | Q | 6 | Q | 3 | 8 |
| Pacific | 117 | 5 | 15 | 13 | 3 | 44 | 1 | 11 | 4 | 6 | 15 |

# Table E5A. Electricity Consumption (kWh) by End Use for All Buildings, 2003

| | Total Electricity Consumption (billion kWh) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Space Heating | Cooling | Ventilation | Water Heating | Lighting | Cooking | Refrigeration | Office Equipment | Computers | Other |
| **All Buildings** | 1,043 | 49 | 141 | 128 | 26 | 393 | 7 | 112 | 20 | 46 | 122 |
| **Climate Zone: 30-Year Average** | | | | | | | | | | | |
| Under 2,000 CDD and -- | | | | | | | | | | | |
| More than 7,000 HDD | 137 | 10 | 8 | 19 | 3 | 53 | 1 | 18 | 3 | 5 | 17 |
| 5,500-7,000 HDD | 254 | 17 | 19 | 32 | 5 | 103 | 2 | 28 | 5 | 12 | 32 |
| 4,000-5,499 HDD | 189 | 10 | 19 | 22 | 4 | 76 | 1 | 19 | 6 | 9 | 22 |
| Fewer than 4,000 HDD | 261 | 8 | 40 | 32 | 8 | 97 | 2 | 30 | 4 | 10 | 31 |
| 2,000 CDD or More and -- | | | | | | | | | | | |
| Fewer than 4,000 HDD | 202 | 4 | 56 | 22 | 6 | 64 | 1 | 17 | 2 | 9 | 20 |
| **Number of Establishments** | | | | | | | | | | | |
| One | 627 | 24 | 80 | 80 | 13 | 231 | 6 | 85 | 12 | 25 | 71 |
| 2 to 5 | 180 | 8 | 24 | 22 | 4 | 72 | 1 | 16 | 4 | 8 | 23 |
| 6 to 10 | 67 | 5 | 9 | 7 | 3 | 26 | (*) | 3 | 1 | Q | 8 |
| 11 to 20 | 64 | 5 | 10 | 7 | 3 | 24 | (*) | 3 | 1 | 2 | 8 |
| More than 20 | 103 | 7 | 18 | 12 | 4 | 38 | (*) | 4 | 2 | 5 | 12 |
| Currently Unoccupied | 3 | Q | Q | (*) | Q | 1 | Q | Q | Q | Q | 1 |
| **Energy Sources (more than one may apply)** | | | | | | | | | | | |
| Electricity | 1,043 | 49 | 141 | 128 | 26 | 393 | 7 | 112 | 20 | 46 | 122 |
| Natural Gas | 743 | 30 | 95 | 98 | 15 | 289 | 5 | 76 | 14 | 33 | 88 |
| Fuel Oil | 275 | 12 | 36 | 38 | 5 | 114 | 1 | 14 | 7 | 15 | 33 |
| District Heat | 101 | 2 | 7 | 21 | 1 | 44 | (*) | 4 | 1 | 9 | 13 |
| **Energy End Uses (more than one may apply)** | | | | | | | | | | | |
| Buildings with Space Heating | 1,006 | 49 | 133 | 125 | 25 | 380 | 7 | 106 | 20 | 45 | 118 |
| Buildings with Cooling | 1,010 | 48 | 141 | 123 | 26 | 377 | 7 | 108 | 20 | 45 | 116 |
| Buildings with Water Heating | 990 | 47 | 134 | 122 | 26 | 370 | 7 | 106 | 20 | 45 | 114 |
| **Annual Consumption (kilowatthours)** | | | | | | | | | | | |
| 10,000 or Less | 4 | (*) | (*) | (*) | (*) | 1 | (*) | 1 | (*) | (*) | 1 |
| 10,001 to 50,000 | 45 | 2 | 6 | 3 | 1 | 16 | (*) | 7 | 1 | 1 | 8 |
| 50,001 to 100,000 | 55 | 3 | 7 | 4 | 1 | 18 | (*) | 11 | 1 | 2 | 8 |
| 100,001 to 500,000 | 238 | 13 | 28 | 23 | 7 | 79 | 3 | 44 | 4 | 8 | 27 |
| 500,001 to 1,000,000 | 110 | 5 | 17 | 14 | 4 | 39 | 1 | 13 | 2 | 4 | 11 |
| 1,000,001 to 5,000,000 | 333 | 16 | 47 | 49 | 8 | 125 | 1 | 26 | 5 | 17 | 37 |
| Over 5,000,000 | 258 | 10 | 36 | 33 | 5 | 114 | 1 | 10 | 7 | 13 | 29 |

See "Guide to the Tables" or "Glossary" for further explanations of the terms used in this table. Both can be accessed from the CBECS web site - http://www.eia.doe.gov/emeu/cbecs.

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

Q=Data withheld because fewer than 20 buildings were sampled for any cell, or because the Relative Standard Error (RSE) was greater than 50 percent for a cell in the "Total" column.

Note: Due to rounding, data may not sum to totals.

Source: Energy Information Administration, Office of Energy Markets and End Use, Form EIA-871A, C, and E of the 2003 Commercial Buildings Energy Consumption Survey.

Released: September, 2008

# Table E6A. Electricity Consumption (kWh) Intensities by End Use for All Buildings, 2003

| | Electricity Energy Intensity (kWh/square foot) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Space Heating | Cooling | Ventilation | Water Heating | Lighting | Cooking | Refrigeration | Office Equipment | Computers | Other |
| **All Buildings** | 14.9 | 0.7 | 2.0 | 1.8 | 0.4 | 5.6 | 0.1 | 1.6 | 0.3 | 0.7 | 1.7 |
| **Building Floorspace (Square Feet)** | | | | | | | | | | | |
| 1,001 to 5,000 | 17.8 | 0.9 | 2.0 | 0.8 | 0.5 | 4.4 | 0.3 | 6.2 | 0.4 | 0.5 | 1.8 |
| 5,001 to 10,000 | 12.9 | 0.8 | 1.7 | 0.8 | 0.3 | 4.2 | 0.2 | 2.5 | 0.3 | 0.4 | 1.7 |
| 10,001 to 25,000 | 11.4 | 0.6 | 1.3 | 1.2 | 0.3 | 4.3 | 0.1 | 1.3 | 0.2 | 0.5 | 1.5 |
| 25,001 to 50,000 | 12.8 | 0.6 | 2.0 | 1.8 | 0.4 | 4.5 | 0.1 | 1.2 | 0.2 | 0.6 | 1.5 |
| 50,001 to 100,000 | 14.9 | 0.8 | 2.2 | 2.2 | 0.4 | 5.8 | 0.1 | 1.0 | 0.2 | 0.6 | 1.7 |
| 100,001 to 200,000 | 16.9 | 0.7 | 2.4 | 2.6 | 0.3 | 6.7 | (*) | 0.9 | 0.4 | 0.9 | 2.0 |
| 200,001 to 500,000 | 15.2 | 0.4 | 2.2 | 2.2 | 0.2 | 6.8 | 0.1 | 0.4 | 0.3 | 0.8 | 1.8 |
| Over 500,000 | 19.2 | 0.9 | 2.6 | 2.6 | 0.4 | 8.4 | 0.1 | 0.7 | 0.3 | 0.9 | 2.1 |
| **Principal Building Activity** | | | | | | | | | | | |
| Education | 11.0 | 0.5 | 2.2 | 2.5 | 0.3 | 3.4 | (*) | 0.5 | 0.1 | 1.0 | 0.6 |
| Food Sales | 49.4 | 1.5 | 2.9 | 1.8 | Q | 10.9 | 0.6 | 28.2 | 0.5 | 0.4 | 2.4 |
| Food Service | 38.4 | 1.8 | 5.0 | 4.3 | 1.8 | 7.5 | 2.4 | 12.3 | 0.3 | 0.3 | 2.6 |
| Health Care | 22.9 | 0.5 | 3.1 | 3.9 | 0.2 | 9.7 | 0.1 | 0.8 | 0.3 | 0.9 | 3.3 |
| Inpatient | 27.5 | 0.5 | 3.8 | 5.9 | 0.3 | 11.7 | 0.1 | 0.6 | 0.3 | 1.0 | 3.2 |
| Outpatient | 16.1 | 0.7 | 2.1 | 1.0 | 0.1 | 6.6 | (*) | 1.0 | 0.4 | 0.8 | 3.5 |
| Lodging | 13.5 | 0.8 | 1.4 | 0.8 | 0.7 | 7.1 | 0.1 | 0.7 | Q | 0.4 | 1.4 |
| Mercantile | 19.2 | 1.5 | 2.9 | 1.8 | 1.0 | 8.1 | 0.1 | 1.3 | 0.2 | 0.3 | 2.2 |
| Retail (Other Than Mall) | 14.3 | 0.4 | 1.7 | 1.1 | 0.1 | 7.5 | (*) | 1.5 | 0.2 | 0.3 | 1.5 |
| Enclosed and Strip Malls | 22.3 | 2.2 | 3.6 | 2.2 | 1.5 | 8.4 | 0.1 | 1.2 | 0.2 | 0.3 | 2.6 |
| Office | 17.3 | 0.8 | 2.4 | 1.5 | 0.2 | 6.8 | (*) | 0.8 | 0.8 | 1.8 | 2.2 |
| Public Assembly | 12.5 | 0.4 | 2.6 | 4.7 | (*) | 2.0 | (*) | 0.7 | Q | 0.2 | 1.7 |
| Public Order and Safety | 15.3 | 0.5 | 2.1 | 2.8 | 0.9 | 4.8 | (*) | 0.9 | 0.2 | 0.4 | 2.7 |
| Religious Worship | 4.9 | 0.2 | 0.8 | 0.4 | (*) | 1.3 | (*) | 0.5 | (*) | 0.1 | 1.4 |
| Service | 11.0 | 0.4 | 1.1 | 1.8 | (*) | 4.6 | Q | 0.6 | 0.1 | 0.2 | 2.1 |
| Warehouse and Storage | 7.6 | 0.2 | 0.4 | 0.6 | 0.1 | 4.1 | Q | 1.1 | 0.1 | 0.1 | 0.9 |
| Other | 22.5 | 0.4 | 2.7 | 1.8 | 0.1 | 10.1 | Q | 1.8 | Q | 0.9 | 3.7 |
| Vacant | 2.4 | 0.1 | 0.2 | 0.2 | Q | 0.7 | Q | 0.1 | Q | (*) | 1.1 |
| **Year Constructed** | | | | | | | | | | | |
| Before 1920 | 7.1 | 0.2 | 0.5 | 0.9 | Q | 2.7 | 0.1 | 1.3 | 0.2 | 0.3 | 0.9 |
| 1920 to 1945 | 9.4 | 0.2 | 0.7 | 1.3 | 0.1 | 4.0 | 0.1 | 1.1 | 0.1 | 0.4 | 1.3 |
| 1946 to 1959 | 10.2 | 0.4 | 1.2 | 1.5 | 0.2 | 3.9 | 0.1 | 1.1 | 0.2 | 0.5 | 1.2 |
| 1960 to 1969 | 12.3 | 0.5 | 1.6 | 1.8 | 0.3 | 4.3 | (*) | 1.4 | 0.2 | 0.6 | 1.5 |
| 1970 to 1979 | 16.7 | 1.0 | 2.2 | 2.1 | 0.4 | 6.4 | 0.1 | 1.6 | 0.3 | 0.7 | 2.0 |
| 1980 to 1989 | 18.8 | 1.0 | 2.8 | 2.0 | 0.6 | 7.1 | 0.1 | 1.8 | 0.4 | 0.9 | 2.2 |
| 1990 to 1999 | 17.6 | 0.8 | 2.6 | 2.2 | 0.5 | 6.3 | 0.1 | 2.0 | 0.4 | 0.8 | 2.0 |
| 2000 to 2003 | 16.9 | 0.8 | 2.6 | 1.8 | 0.4 | 6.6 | 0.1 | 2.0 | 0.2 | 0.5 | 1.9 |
| **Census Region and Division** | | | | | | | | | | | |
| Northeast | 12.4 | 0.7 | 0.9 | 1.6 | 0.3 | 5.0 | 0.1 | 1.3 | 0.3 | 0.7 | 1.5 |
| New England | 12.0 | 0.8 | 0.7 | 1.3 | 0.4 | 4.7 | 0.1 | 1.8 | 0.2 | 0.6 | 1.4 |
| Middle Atlantic | 12.5 | 0.7 | 1.0 | 1.7 | 0.2 | 5.1 | (*) | 1.2 | 0.3 | 0.7 | 1.6 |
| Midwest | 13.2 | 0.9 | 0.9 | 1.8 | 0.2 | 5.2 | 0.1 | 1.5 | 0.3 | 0.6 | 1.7 |
| East North Central | 13.8 | 0.8 | 0.9 | 2.0 | 0.2 | 5.5 | 0.1 | 1.5 | 0.3 | 0.7 | 1.8 |
| West North Central | 12.0 | 1.1 | 1.0 | 1.4 | 0.3 | 4.4 | 0.1 | 1.6 | 0.2 | 0.5 | 1.5 |
| South | 17.4 | 0.6 | 3.4 | 2.0 | 0.5 | 6.1 | 0.1 | 1.9 | 0.2 | 0.7 | 1.8 |
| South Atlantic | 18.3 | 0.7 | 3.3 | 2.1 | 0.6 | 6.6 | 0.2 | 2.0 | 0.3 | 0.8 | 1.9 |
| East South Central | 16.2 | 0.7 | 2.2 | 2.0 | 0.4 | 6.0 | Q | 2.1 | 0.2 | 0.5 | 2.0 |
| West South Central | 16.3 | 0.4 | 4.0 | 1.8 | 0.4 | 5.4 | 0.1 | 1.6 | 0.2 | 0.5 | 1.8 |
| West | 14.7 | 0.7 | 1.9 | 1.7 | 0.3 | 5.7 | 0.1 | 1.4 | 0.5 | 0.7 | 1.8 |
| Mountain | 16.3 | 0.9 | 2.2 | 1.9 | 0.3 | 6.6 | 0.1 | 1.4 | Q | 0.6 | 1.9 |
| Pacific | 14.0 | 0.6 | 1.8 | 1.6 | 0.3 | 5.3 | 0.1 | 1.4 | 0.5 | 0.7 | 1.8 |

# Table E6A. Electricity Consumption (kWh) Intensities by End Use for All Buildings, 2003

| | Electricity Energy Intensity (kWh/square foot) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Space Heating | Cooling | Ventilation | Water Heating | Lighting | Cooking | Refrigeration | Office Equipment | Computers | Other |
| **All Buildings** | 14.9 | 0.7 | 2.0 | 1.8 | 0.4 | 5.6 | 0.1 | 1.6 | 0.3 | 0.7 | 1.7 |
| **Climate Zone: 30-Year Average** | | | | | | | | | | | |
| Under 2,000 CDD and -- | | | | | | | | | | | |
| More than 7,000 HDD | 12.1 | 0.9 | 0.7 | 1.7 | 0.2 | 4.7 | 0.1 | 1.6 | 0.2 | 0.5 | 1.5 |
| 5,500-7,000 HDD | 13.7 | 0.9 | 1.0 | 1.7 | 0.3 | 5.6 | 0.1 | 1.5 | 0.3 | 0.6 | 1.7 |
| 4,000-5,499 HDD | 15.3 | 0.8 | 1.6 | 1.8 | 0.3 | 6.1 | 0.1 | 1.5 | 0.5 | 0.8 | 1.8 |
| Fewer than 4,000 HDD | 15.3 | 0.5 | 2.3 | 1.8 | 0.5 | 5.7 | 0.1 | 1.7 | 0.3 | 0.6 | 1.8 |
| 2,000 CDD or More and -- | | | | | | | | | | | |
| Fewer than 4,000 HDD | 18.5 | 0.3 | 5.1 | 2.0 | 0.6 | 5.9 | 0.1 | 1.6 | 0.2 | 0.8 | 1.9 |
| **Number of Establishments** | | | | | | | | | | | |
| One | 14.1 | 0.5 | 1.8 | 1.8 | 0.3 | 5.2 | 0.1 | 1.9 | 0.3 | 0.6 | 1.6 |
| 2 to 5 | 14.4 | 0.6 | 1.9 | 1.7 | 0.3 | 5.7 | 0.1 | 1.3 | 0.3 | 0.6 | 1.8 |
| 6 to 10 | 20.0 | 1.4 | 2.6 | 2.2 | 0.8 | 7.8 | (*) | 1.0 | 0.4 | 1.6 | 2.3 |
| 11 to 20 | 18.9 | 1.4 | 3.1 | 2.2 | 0.8 | 7.1 | (*) | 1.0 | 0.3 | 0.7 | 2.4 |
| More than 20 | 20.3 | 1.4 | 3.6 | 2.3 | 0.8 | 7.6 | 0.1 | 0.8 | 0.4 | 1.0 | 2.3 |
| Currently Unoccupied | 1.8 | Q | Q | (*) | Q | 0.5 | Q | Q | Q | Q | 0.9 |
| **Energy Sources (more than one may apply)** | | | | | | | | | | | |
| Electricity | 14.9 | 0.7 | 2.0 | 1.8 | 0.4 | 5.6 | 0.1 | 1.6 | 0.3 | 0.7 | 1.7 |
| Natural Gas | 15.3 | 0.6 | 2.0 | 2.0 | 0.3 | 6.0 | 0.1 | 1.6 | 0.3 | 0.7 | 1.8 |
| Fuel Oil | 16.9 | 0.7 | 2.2 | 2.3 | 0.3 | 7.0 | 0.1 | 0.8 | 0.5 | 0.9 | 2.0 |
| District Heat | 18.1 | 0.3 | 1.3 | 3.7 | 0.2 | 7.9 | (*) | 0.7 | 0.2 | 1.5 | 2.3 |
| **Energy End Uses (more than one may apply)** | | | | | | | | | | | |
| Buildings with Space Heating | 15.2 | 0.7 | 2.0 | 1.9 | 0.4 | 5.7 | 0.1 | 1.6 | 0.3 | 0.7 | 1.8 |
| Buildings with Cooling | 15.9 | 0.8 | 2.2 | 1.9 | 0.4 | 5.9 | 0.1 | 1.7 | 0.3 | 0.7 | 1.8 |
| Buildings with Water Heating | 15.8 | 0.7 | 2.1 | 1.9 | 0.4 | 5.9 | 0.1 | 1.7 | 0.3 | 0.7 | 1.8 |
| **Annual Consumption (kilowatthours)** | | | | | | | | | | | |
| 10,000 or Less | 1.3 | (*) | 0.1 | 0.1 | (*) | 0.4 | (*) | 0.2 | (*) | (*) | 0.4 |
| 10,001 to 50,000 | 4.9 | 0.2 | 0.6 | 0.3 | 0.1 | 1.8 | (*) | 0.7 | 0.1 | 0.2 | 0.9 |
| 50,001 to 100,000 | 8.1 | 0.4 | 1.0 | 0.6 | 0.2 | 2.6 | 0.1 | 1.6 | 0.2 | 0.3 | 1.2 |
| 100,001 to 500,000 | 13.5 | 0.8 | 1.6 | 1.3 | 0.4 | 4.5 | 0.2 | 2.5 | 0.2 | 0.5 | 1.6 |
| 500,001 to 1,000,000 | 15.0 | 0.7 | 2.3 | 1.9 | 0.5 | 5.3 | 0.1 | 1.8 | 0.2 | 0.5 | 1.5 |
| 1,000,001 to 5,000,000 | 21.4 | 1.0 | 3.0 | 3.2 | 0.5 | 8.0 | 0.1 | 1.7 | 0.4 | 1.1 | 2.3 |
| Over 5,000,000 | 24.0 | 0.9 | 3.4 | 3.1 | 0.5 | 10.6 | 0.1 | 1.0 | 0.6 | 1.2 | 2.7 |

See "Guide to the Tables" or "Glossary" for further explanations of the terms used in this table. Both can be accessed from the CBECS web site - http://www.eia.doe.gov/emeu/cbecs.

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

Q=Data withheld because fewer than 20 buildings were sampled for any cell, or because the Relative Standard Error (RSE) was greater than 50 percent for a cell in the "Total" column.

Note: Due to rounding, data may not sum to totals.

Source: Energy Information Administration, Office of Energy Markets and End Use, Form EIA-871A, C, and E of the 2003 Commercial Buildings Energy Consumption Survey.

Released: September, 2008

# Table E7A. Natural Gas Consumption (Btu) and Energy Intensities by End Use for All Buildings, 2003

| | Total Natural Gas Consumption (trillion Btu) | | | | | Natural Gas Energy Intensity (thousand Btu/square foot) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Space Heating | Water Heating | Cook-ing | Other | Total | Space Heating | Water Heating | Cook-ing | Other |
| **All Buildings** | 2,100 | 1,420 | 348 | 164 | 168 | 43.3 | 29.3 | 7.2 | 3.4 | 3.5 |
| **Building Floorspace (Square Feet)** | | | | | | | | | | |
| 1,001 to 5,000 | 257 | 161 | 36 | 42 | 18 | 81.0 | 50.6 | 11.3 | 13.3 | 5.8 |
| 5,001 to 10,000 | 224 | 152 | 33 | 32 | 7 | 56.5 | 38.3 | 8.4 | 8.1 | 1.7 |
| 10,001 to 25,000 | 353 | 273 | 35 | 26 | 19 | 45.2 | 34.9 | 4.5 | 3.3 | 2.4 |
| 25,001 to 50,000 | 278 | 202 | 43 | 14 | Q | 42.2 | 30.6 | 6.5 | 2.1 | 3.0 |
| 50,001 to 100,000 | 277 | 192 | 47 | 14 | 25 | 36.9 | 25.6 | 6.2 | 1.8 | 3.3 |
| 100,001 to 200,000 | 275 | 187 | 58 | 10 | 20 | 36.5 | 24.8 | 7.7 | 1.3 | 2.7 |
| 200,001 to 500,000 | 211 | 138 | 44 | 11 | 17 | 35.8 | 23.4 | 7.5 | 1.9 | 2.9 |
| Over 500,000 | 224 | 115 | 52 | 14 | 42 | 37.5 | 19.3 | 8.7 | 2.4 | 7.0 |
| **Principal Building Activity** | | | | | | | | | | |
| Education | 268 | 207 | 37 | 5 | 19 | 38.1 | 29.5 | 5.2 | 0.7 | 2.7 |
| Food Sales | 39 | 27 | 2 | 8 | Q | 51.7 | 35.6 | 3.2 | 11.2 | Q |
| Food Service | 203 | 54 | 56 | 91 | Q | 145.6 | 39.0 | 40.0 | 65.4 | Q |
| Health Care | 243 | 136 | 74 | 10 | 23 | 95.3 | 53.6 | 28.9 | 3.8 | 9.1 |
| Inpatient | 204 | 103 | 71 | 9 | 21 | 113.2 | 56.8 | 39.4 | 5.2 | 11.9 |
| Outpatient | 38 | 34 | 3 | Q | Q | 51.8 | 45.6 | 3.5 | Q | Q |
| Lodging | 215 | 64 | 124 | 14 | Q | 50.4 | 15.0 | 29.2 | 3.3 | Q |
| Mercantile | 264 | 188 | 19 | 24 | 33 | 33.5 | 23.9 | 2.4 | 3.1 | 4.1 |
| Retail (Other Than Mall) | 91 | 84 | 3 | 3 | 2 | 31.9 | 29.3 | 1.0 | 0.9 | 0.7 |
| Enclosed and Strip Malls | 172 | 104 | 16 | 22 | 31 | 34.4 | 20.9 | 3.1 | 4.3 | 6.1 |
| Office | 269 | 230 | 13 | 3 | 23 | 32.8 | 28.1 | 1.6 | 0.3 | 2.8 |
| Public Assembly | 102 | 92 | 2 | 3 | Q | 37.5 | 33.8 | 0.9 | 1.0 | Q |
| Public Order and Safety | 29 | 15 | 10 | Q | Q | 45.0 | 24.1 | 15.1 | Q | Q |
| Religious Worship | 82 | 77 | 2 | 3 | Q | 31.2 | 29.1 | 0.9 | 1.0 | Q |
| Service | 139 | 119 | 2 | Q | 17 | 55.8 | 47.8 | 0.9 | Q | Q |
| Warehouse and Storage | 132 | 111 | 4 | Q | Q | 24.1 | 20.2 | 0.7 | Q | Q |
| Other | 87 | 72 | 2 | Q | 12 | 69.7 | 57.9 | 1.7 | Q | 9.4 |
| Vacant | 28 | 26 | Q | Q | Q | 23.7 | 22.0 | Q | Q | Q |
| **Year Constructed** | | | | | | | | | | |
| Before 1920 | 143 | 114 | 12 | 15 | Q | 51.7 | 41.0 | 4.4 | 5.5 | Q |
| 1920 to 1945 | 232 | 152 | 24 | 18 | 38 | 48.6 | 31.8 | 5.1 | 3.8 | 7.9 |
| 1946 to 1959 | 223 | 163 | 35 | 11 | 14 | 45.9 | 33.5 | 7.2 | 2.4 | 2.8 |
| 1960 to 1969 | 276 | 200 | 47 | 12 | 17 | 44.9 | 32.6 | 7.6 | 2.0 | 2.7 |
| 1970 to 1979 | 402 | 272 | 72 | 28 | 30 | 45.7 | 31.0 | 8.2 | 3.1 | 3.4 |
| 1980 to 1989 | 339 | 207 | 72 | 28 | 31 | 43.3 | 26.4 | 9.2 | 3.6 | 4.0 |
| 1990 to 1999 | 345 | 226 | 58 | 33 | 27 | 37.5 | 24.6 | 6.3 | 3.6 | 3.0 |
| 2000 to 2003 | 140 | 86 | 28 | 17 | 9 | 34.3 | 21.0 | 6.9 | 4.2 | 2.2 |
| **Census Region and Division** | | | | | | | | | | |
| Northeast | 462 | 332 | 51 | 34 | 45 | 45.5 | 32.7 | 5.1 | 3.3 | 4.4 |
| New England | 87 | 69 | Q | Q | 5 | 46.8 | 36.9 | 4.3 | 2.8 | 2.9 |
| Middle Atlantic | 375 | 263 | 44 | 29 | 39 | 45.2 | 31.7 | 5.2 | 3.5 | 4.7 |
| Midwest | 751 | 589 | 82 | 32 | 47 | 53.1 | 41.7 | 5.8 | 2.3 | 3.3 |
| East North Central | 567 | 452 | 62 | 23 | 30 | 54.8 | 43.7 | 6.0 | 2.2 | 2.9 |
| West North Central | 184 | 137 | 20 | 9 | Q | 48.5 | 36.2 | 5.4 | 2.4 | 4.5 |
| South | 527 | 291 | 129 | 68 | 38 | 34.5 | 19.1 | 8.4 | 4.5 | 2.5 |
| South Atlantic | 246 | 132 | 60 | 32 | 22 | 33.7 | 18.1 | 8.2 | 4.4 | 3.0 |
| East South Central | 107 | 69 | 25 | 8 | 5 | 42.6 | 27.4 | 10.0 | 3.3 | 1.8 |
| West South Central | 174 | 90 | 44 | 28 | 12 | 31.8 | 16.5 | 8.0 | 5.1 | 2.2 |
| West | 360 | 208 | 85 | 29 | 38 | 40.5 | 23.4 | 9.6 | 3.3 | 4.3 |
| Mountain | 190 | 132 | 35 | 6 | 17 | 58.4 | 40.5 | 10.8 | 2.0 | 5.1 |
| Pacific | 170 | 76 | 50 | 23 | 21 | 30.1 | 13.5 | 8.9 | 4.0 | 3.8 |

# Table E7A. Natural Gas Consumption (Btu) and Energy Intensities by End Use for All Buildings, 2003

| | Total Natural Gas Consumption (trillion Btu) | | | | | Natural Gas Energy Intensity (thousand Btu/square foot) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Space Heating | Water Heating | Cook-ing | Other | Total | Space Heating | Water Heating | Cook-ing | Other |
| **All Buildings** | 2,100 | 1,420 | 348 | 164 | 168 | 43.3 | 29.3 | 7.2 | 3.4 | 3.5 |
| **Climate Zone: 30-Year Average** | | | | | | | | | | |
| Under 2,000 CDD and -- | | | | | | | | | | |
| More than 7,000 HDD | 468 | 381 | 48 | 18 | 20 | 55.2 | 44.9 | 5.7 | 2.2 | 2.4 |
| 5,500-7,000 HDD | 737 | 553 | 96 | 40 | 49 | 52.2 | 39.1 | 6.8 | 2.8 | 3.5 |
| 4,000-5,499 HDD | 368 | 231 | 55 | 32 | 49 | 41.0 | 25.8 | 6.1 | 3.6 | 5.5 |
| Fewer than 4,000 HDD | 389 | 209 | 96 | 46 | 39 | 33.0 | 17.7 | 8.1 | 3.9 | 3.3 |
| 2,000 CDD or More and -- | | | | | | | | | | |
| Fewer than 4,000 HDD | 138 | 46 | 54 | 27 | 11 | 27.1 | 9.0 | 10.5 | 5.4 | 2.2 |
| **Number of Establishments** | | | | | | | | | | |
| One | 1,462 | 971 | 275 | 118 | 98 | 47.9 | 31.8 | 9.0 | 3.9 | 3.2 |
| 2 to 5 | 359 | 265 | 45 | 24 | 24 | 41.2 | 30.5 | 5.2 | 2.7 | 2.8 |
| 6 to 10 | 95 | 68 | 9 | 8 | 11 | 39.8 | 28.5 | 3.7 | 3.1 | 4.4 |
| 11 to 20 | 69 | 47 | 8 | 6 | 8 | 31.1 | 21.0 | 3.5 | 2.9 | 3.7 |
| More than 20 | 96 | 52 | 11 | 7 | Q | 26.1 | 14.0 | 3.0 | 2.0 | Q |
| Currently Unoccupied | 18 | 17 | (*) | Q | Q | 19.4 | 18.5 | 0.1 | Q | Q |
| **Energy Sources (more than one may apply)** | | | | | | | | | | |
| Electricity | 2,100 | 1,420 | 348 | 164 | 168 | 43.3 | 29.3 | 7.2 | 3.4 | 3.5 |
| Natural Gas | 2,100 | 1,420 | 348 | 164 | 168 | 43.3 | 29.3 | 7.2 | 3.4 | 3.5 |
| Fuel Oil | 523 | 291 | 147 | 30 | 55 | 46.3 | 25.7 | 13.0 | 2.7 | 4.8 |
| District Heat | 48 | 24 | 10 | 7 | 6 | 18.6 | 9.4 | 4.0 | 2.8 | 2.4 |
| **Energy End Uses (more than one may apply)** | | | | | | | | | | |
| Buildings with Space Heating | 2,077 | 1,420 | 343 | 158 | 155 | 43.4 | 29.7 | 7.2 | 3.3 | 3.3 |
| Buildings with Cooling | 1,987 | 1,337 | 335 | 160 | 155 | 43.3 | 29.1 | 7.3 | 3.5 | 3.4 |
| Buildings with Water Heating | 2,035 | 1,361 | 348 | 163 | 163 | 44.4 | 29.7 | 7.6 | 3.6 | 3.6 |
| **Annual Consumption (hundred cubic feet)** | | | | | | | | | | |
| 1,000 or Less | 37 | 31 | 4 | 1 | Q | 8.4 | 7.0 | 1.0 | 0.3 | Q |
| 1,001 to 5,000 | 265 | 218 | 25 | 16 | 6 | 25.5 | 21.0 | 2.4 | 1.6 | 0.6 |
| 5,001 to 10,000 | 274 | 192 | 36 | 36 | 9 | 39.4 | 27.6 | 5.2 | 5.2 | 1.3 |
| 10,001 to 25,000 | 402 | 261 | 65 | 47 | 30 | 46.8 | 30.4 | 7.5 | 5.4 | 3.5 |
| 25,001 to 50,000 | 334 | 223 | 49 | 33 | 28 | 49.1 | 32.8 | 7.2 | 4.9 | 4.2 |
| 50,001 to 100,000 | 242 | 159 | 42 | 10 | 31 | 51.2 | 33.7 | 8.9 | 2.1 | 6.6 |
| Over 100,000 | 546 | 336 | 127 | 20 | 63 | 82.4 | 50.8 | 19.2 | 3.0 | 9.5 |

See "Guide to the Tables" or "Glossary" for further explanations of the terms used in this table. Both can be accessed from the CBECS web site - http://www.eia.doe.gov/emeu/cbecs.

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

Q=Data withheld because fewer than 20 buildings were sampled for any cell, or because the Relative Standard Error (RSE) was greater than 50 percent for a cell in the "Total" column.

Note: Due to rounding, data may not sum to totals.

Source: Energy Information Administration, Office of Energy Markets and End Use, Form EIA-871A, C, and E of the 2003 Commercial Buildings Energy Consumption Survey.

Released: September, 2008

# Table E8A. Natural Gas Consumption (cubic feet) and Energy Intensities by End Use for All Buildings, 2003

| | Total Natural Gas Consumption (billion cubic feet) | | | | | Natural Gas Energy Intensity (cubic feet/square foot) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Space Heating | Water Heating | Cook-ing | Other | Total | Space Heating | Water Heating | Cook-ing | Other |
| **All Buildings** | 2,037 | 1,378 | 338 | 159 | 163 | 42.0 | 28.4 | 7.0 | 3.3 | 3.4 |
| **Building Floorspace (Square Feet)** | | | | | | | | | | |
| 1,001 to 5,000 | 249 | 156 | 35 | 41 | 18 | 78.6 | 49.1 | 11.0 | 12.9 | 5.6 |
| 5,001 to 10,000 | 218 | 147 | 32 | 31 | 7 | 54.8 | 37.1 | 8.1 | 7.9 | 1.7 |
| 10,001 to 25,000 | 343 | 265 | 34 | 25 | 18 | 43.8 | 33.9 | 4.4 | 3.2 | 2.3 |
| 25,001 to 50,000 | 270 | 196 | 41 | 13 | Q | 40.9 | 29.7 | 6.3 | 2.0 | 2.9 |
| 50,001 to 100,000 | 269 | 186 | 45 | 13 | 24 | 35.8 | 24.8 | 6.0 | 1.8 | 3.2 |
| 100,001 to 200,000 | 267 | 182 | 56 | 10 | 19 | 35.4 | 24.1 | 7.4 | 1.3 | 2.6 |
| 200,001 to 500,000 | 204 | 134 | 43 | 11 | 17 | 34.7 | 22.7 | 7.3 | 1.8 | 2.9 |
| Over 500,000 | 217 | 112 | 51 | 14 | 41 | 36.4 | 18.7 | 8.5 | 2.3 | 6.8 |
| **Principal Building Activity** | | | | | | | | | | |
| Education | 260 | 201 | 36 | 5 | 18 | 36.9 | 28.6 | 5.1 | 0.7 | 2.6 |
| Food Sales | 37 | 26 | 2 | 8 | Q | 50.2 | 34.5 | 3.1 | 10.9 | Q |
| Food Service | 197 | 53 | 54 | 89 | Q | 141.2 | 37.8 | 38.8 | 63.5 | Q |
| Health Care | 235 | 132 | 71 | 9 | 22 | 92.5 | 51.9 | 28.1 | 3.7 | 8.8 |
| Inpatient | 198 | 99 | 69 | 9 | 21 | 109.8 | 55.1 | 38.2 | 5.0 | 11.5 |
| Outpatient | 37 | 33 | 2 | Q | Q | 50.2 | 44.3 | 3.4 | Q | Q |
| Lodging | 208 | 62 | 121 | 14 | Q | 48.9 | 14.6 | 28.3 | 3.2 | Q |
| Mercantile | 256 | 183 | 18 | 23 | 32 | 32.5 | 23.2 | 2.3 | 3.0 | 4.0 |
| Retail (Other Than Mall) | 89 | 81 | 3 | 2 | 2 | 30.9 | 28.4 | 1.0 | 0.8 | 0.7 |
| Enclosed and Strip Malls | 167 | 101 | 15 | 21 | 30 | 33.4 | 20.2 | 3.0 | 4.2 | 5.9 |
| Office | 261 | 223 | 13 | 2 | 22 | 31.8 | 27.2 | 1.6 | 0.3 | 2.7 |
| Public Assembly | 99 | 89 | 2 | 3 | Q | 36.4 | 32.8 | 0.9 | 1.0 | Q |
| Public Order and Safety | 28 | 15 | 9 | Q | Q | 43.7 | 23.3 | 14.7 | Q | Q |
| Religious Worship | 80 | 74 | 2 | 3 | Q | 30.3 | 28.3 | 0.9 | 1.0 | Q |
| Service | 135 | 116 | 2 | Q | 17 | 54.1 | 46.3 | 0.9 | Q | Q |
| Warehouse and Storage | 128 | 108 | 4 | Q | Q | 23.4 | 19.6 | 0.7 | Q | Q |
| Other | 85 | 70 | 2 | Q | 11 | 67.6 | 56.1 | 1.6 | Q | 9.1 |
| Vacant | 27 | 25 | Q | Q | Q | 23.0 | 21.3 | Q | Q | Q |
| **Year Constructed** | | | | | | | | | | |
| Before 1920 | 139 | 110 | 12 | 15 | Q | 50.2 | 39.8 | 4.2 | 5.3 | Q |
| 1920 to 1945 | 225 | 147 | 24 | 18 | 37 | 47.1 | 30.8 | 4.9 | 3.7 | 7.7 |
| 1946 to 1959 | 216 | 158 | 34 | 11 | 13 | 44.5 | 32.5 | 6.9 | 2.3 | 2.7 |
| 1960 to 1969 | 268 | 194 | 45 | 12 | 16 | 43.6 | 31.6 | 7.3 | 2.0 | 2.6 |
| 1970 to 1979 | 390 | 264 | 70 | 27 | 29 | 44.3 | 30.0 | 8.0 | 3.0 | 3.3 |
| 1980 to 1989 | 328 | 201 | 70 | 28 | 30 | 42.0 | 25.7 | 8.9 | 3.5 | 3.9 |
| 1990 to 1999 | 334 | 220 | 56 | 32 | 27 | 36.3 | 23.9 | 6.1 | 3.5 | 2.9 |
| 2000 to 2003 | 136 | 83 | 27 | 17 | 9 | 33.2 | 20.4 | 6.7 | 4.1 | 2.1 |
| **Census Region and Division** | | | | | | | | | | |
| Northeast | 448 | 322 | 50 | 33 | 43 | 44.1 | 31.7 | 4.9 | 3.2 | 4.3 |
| New England | 85 | 67 | Q | Q | 5 | 45.4 | 35.8 | 4.1 | 2.7 | 2.8 |
| Middle Atlantic | 364 | 255 | 42 | 28 | 38 | 43.8 | 30.8 | 5.1 | 3.4 | 4.6 |
| Midwest | 728 | 571 | 80 | 31 | 45 | 51.5 | 40.4 | 5.7 | 2.2 | 3.2 |
| East North Central | 550 | 439 | 60 | 23 | 29 | 53.1 | 42.3 | 5.8 | 2.2 | 2.8 |
| West North Central | 178 | 133 | 20 | 9 | Q | 47.0 | 35.1 | 5.2 | 2.3 | 4.4 |
| South | 511 | 283 | 125 | 66 | 37 | 33.5 | 18.5 | 8.2 | 4.3 | 2.4 |
| South Atlantic | 238 | 128 | 58 | 31 | 21 | 32.7 | 17.6 | 8.0 | 4.3 | 2.9 |
| East South Central | 104 | 67 | 24 | 8 | 4 | 41.3 | 26.6 | 9.7 | 3.2 | 1.7 |
| West South Central | 168 | 87 | 42 | 27 | 12 | 30.9 | 16.0 | 7.8 | 4.9 | 2.1 |
| West | 350 | 202 | 83 | 28 | 37 | 39.3 | 22.6 | 9.3 | 3.2 | 4.1 |
| Mountain | 185 | 128 | 34 | 6 | 16 | 56.6 | 39.2 | 10.5 | 1.9 | 5.0 |
| Pacific | 165 | 74 | 49 | 22 | 21 | 29.2 | 13.1 | 8.6 | 3.9 | 3.7 |

# Table E8A. Natural Gas Consumption (cubic feet) and Energy Intensities by End Use for All Buildings, 2003

| | Total Natural Gas Consumption (billion cubic feet) | | | | | Natural Gas Energy Intensity (cubic feet/square foot) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Space Heating | Water Heating | Cook-ing | Other | Total | Space Heating | Water Heating | Cook-ing | Other |
| **All Buildings** | 2,037 | 1,378 | 338 | 159 | 163 | 42.0 | 28.4 | 7.0 | 3.3 | 3.4 |
| **Climate Zone: 30-Year Average** | | | | | | | | | | |
| Under 2,000 CDD and -- | | | | | | | | | | |
| More than 7,000 HDD | 454 | 370 | 47 | 18 | 20 | 53.5 | 43.6 | 5.5 | 2.1 | 2.3 |
| 5,500-7,000 HDD | 715 | 536 | 93 | 38 | 47 | 50.6 | 38.0 | 6.6 | 2.7 | 3.4 |
| 4,000-5,499 HDD | 356 | 224 | 53 | 31 | 48 | 39.7 | 25.0 | 5.9 | 3.5 | 5.3 |
| Fewer than 4,000 HDD | 378 | 203 | 93 | 45 | 38 | 32.0 | 17.2 | 7.9 | 3.8 | 3.2 |
| 2,000 CDD or More and -- | | | | | | | | | | |
| Fewer than 4,000 HDD | 134 | 45 | 52 | 27 | 11 | 26.3 | 8.8 | 10.2 | 5.2 | 2.1 |
| **Number of Establishments** | | | | | | | | | | |
| One | 1,418 | 942 | 267 | 115 | 95 | 46.5 | 30.9 | 8.7 | 3.8 | 3.1 |
| 2 to 5 | 348 | 257 | 44 | 23 | 24 | 40.0 | 29.5 | 5.0 | 2.7 | 2.7 |
| 6 to 10 | 92 | 66 | 9 | 7 | 10 | 38.6 | 27.6 | 3.6 | 3.0 | 4.3 |
| 11 to 20 | 67 | 45 | 8 | 6 | 8 | 30.2 | 20.4 | 3.4 | 2.8 | 3.6 |
| More than 20 | 93 | 50 | 11 | 7 | Q | 25.3 | 13.6 | 2.9 | 1.9 | Q |
| Currently Unoccupied | 18 | 17 | (*) | Q | Q | 18.8 | 18.0 | 0.1 | Q | Q |
| **Energy Sources (more than one may apply)** | | | | | | | | | | |
| Electricity | 2,037 | 1,378 | 338 | 159 | 163 | 42.0 | 28.4 | 7.0 | 3.3 | 3.4 |
| Natural Gas | 2,037 | 1,378 | 338 | 159 | 163 | 42.0 | 28.4 | 7.0 | 3.3 | 3.4 |
| Fuel Oil | 507 | 282 | 143 | 29 | 53 | 44.9 | 25.0 | 12.6 | 2.6 | 4.7 |
| District Heat | 47 | 23 | 10 | 7 | 6 | 18.0 | 9.1 | 3.9 | 2.7 | 2.3 |
| **Energy End Uses (more than one may apply)** | | | | | | | | | | |
| Buildings with Space Heating | 2,014 | 1,378 | 333 | 153 | 151 | 42.1 | 28.8 | 7.0 | 3.2 | 3.2 |
| Buildings with Cooling | 1,927 | 1,296 | 325 | 155 | 151 | 42.0 | 28.3 | 7.1 | 3.4 | 3.3 |
| Buildings with Water Heating | 1,974 | 1,320 | 338 | 158 | 158 | 43.0 | 28.8 | 7.4 | 3.5 | 3.5 |
| **Annual Consumption (hundred cubic feet)** | | | | | | | | | | |
| 1,000 or Less | 36 | 30 | 4 | 1 | Q | 8.2 | 6.8 | 1.0 | 0.3 | Q |
| 1,001 to 5,000 | 257 | 211 | 24 | 16 | 6 | 24.8 | 20.4 | 2.3 | 1.5 | 0.6 |
| 5,001 to 10,000 | 265 | 186 | 35 | 35 | 9 | 38.2 | 26.8 | 5.1 | 5.1 | 1.3 |
| 10,001 to 25,000 | 390 | 253 | 63 | 45 | 29 | 45.4 | 29.4 | 7.3 | 5.2 | 3.4 |
| 25,001 to 50,000 | 324 | 217 | 47 | 32 | 28 | 47.6 | 31.9 | 7.0 | 4.8 | 4.0 |
| 50,001 to 100,000 | 234 | 154 | 41 | 9 | 30 | 49.7 | 32.7 | 8.6 | 2.0 | 6.4 |
| Over 100,000 | 529 | 326 | 123 | 19 | 61 | 79.9 | 49.3 | 18.6 | 2.9 | 9.2 |

See "Guide to the Tables" or "Glossary" for further explanations of the terms used in this table. Both can be accessed from the CBECS web site - http://www.eia.doe.gov/emeu/cbecs.

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

Q=Data withheld because fewer than 20 buildings were sampled for any cell, or because the Relative Standard Error (RSE) was greater than 50 percent for a cell in the "Total" column.

Note: Due to rounding, data may not sum to totals.

Source: Energy Information Administration, Office of Energy Markets and End Use, Form EIA-871A, C, and E of the 2003 Commercial Buildings Energy Consumption Survey.

Released: September, 2008

# Table E9A. Fuel Oil Consumption (Btu) and Energy Intensities by End Use for All Buildings, 2003

| | Total Fuel Oil Consumption (trillion Btu) | | | | | Fuel Oil Energy Intensity (thousand Btu/square foot) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Space Heating | Water Heating | Cook-ing | Other | Total | Space Heating | Water Heating | Cook-ing | Other |
| **All Buildings** | 228 | 198 | 18 | Q | 10 | 14.0 | 12.2 | 1.1 | Q | 0.6 |
| **Building Floorspace (Square Feet)** | | | | | | | | | | |
| 1,001 to 5,000 | 34 | 32 | Q | (*) | Q | 56.9 | 52.2 | Q | (*) | Q |
| 5,001 to 10,000 | 36 | 33 | Q | (*) | Q | 49.4 | 44.7 | Q | 0.1 | Q |
| 10,001 to 25,000 | 28 | 25 | 1 | (*) | Q | 26.7 | 23.8 | 1.4 | 0.1 | Q |
| 25,001 to 50,000 | 17 | 16 | Q | (*) | 1 | 19.1 | 17.8 | Q | (*) | 0.6 |
| 50,001 to 100,000 | 29 | 26 | 1 | Q | 1 | 15.6 | 14.1 | 0.7 | Q | 0.5 |
| 100,001 to 200,000 | 37 | 35 | Q | Q | 1 | 12.5 | 11.5 | Q | Q | 0.5 |
| 200,001 to 500,000 | 36 | 25 | Q | Q | 2 | 10.5 | 7.4 | 2.4 | Q | 0.5 |
| Over 500,000 | 10 | Q | Q | Q | 2 | 2.1 | Q | Q | Q | 0.4 |
| **Principal Building Activity** | | | | | | | | | | |
| Education | 47 | 45 | 2 | Q | Q | 25.4 | 23.9 | 0.8 | Q | 0.3 |
| Food Sales | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Food Service | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Health Care | 11 | 6 | 2 | Q | 2 | 5.6 | 3.3 | 0.8 | Q | 1.3 |
| Inpatient | 9 | 5 | 2 | Q | 2 | 5.3 | 2.9 | 0.9 | Q | 1.4 |
| Outpatient | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Lodging | 35 | 25 | Q | (*) | 1 | 16.1 | 11.2 | Q | 0.2 | 0.3 |
| Mercantile | 21 | Q | Q | (*) | Q | Q | Q | Q | Q | Q |
| Retail (Other Than Mall) | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Enclosed and Strip Malls | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Office | 18 | 15 | Q | Q | 1 | 4.3 | 3.8 | Q | Q | 0.4 |
| Public Assembly | 29 | 28 | Q | (*) | Q | 30.7 | 29.7 | Q | (*) | Q |
| Public Order and Safety | 8 | 6 | Q | (*) | Q | Q | Q | Q | Q | Q |
| Religious Worship | 18 | 18 | Q | (*) | Q | 39.8 | 39.3 | Q | (*) | Q |
| Service | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Warehouse and Storage | 9 | Q | Q | (*) | Q | 7.3 | 6.3 | Q | 0.1 | Q |
| Other | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Vacant | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| **Year Constructed** | | | | | | | | | | |
| Before 1920 | 38 | 35 | Q | (*) | Q | 39.3 | 36.4 | Q | 0.2 | Q |
| 1920 to 1945 | 55 | 45 | 9 | Q | (*) | 27.2 | 22.3 | 4.7 | Q | 0.1 |
| 1946 to 1959 | 48 | 45 | Q | (*) | Q | 22.8 | 21.3 | Q | (*) | Q |
| 1960 to 1969 | Q | Q | Q | Q | Q | 21.7 | 19.7 | Q | Q | 0.7 |
| 1970 to 1979 | 23 | 19 | 1 | Q | 2 | 9.5 | 8.1 | 0.6 | Q | 0.8 |
| 1980 to 1989 | 12 | 9 | 1 | Q | 2 | 3.5 | 2.7 | 0.2 | Q | 0.6 |
| 1990 to 1999 | 9 | 6 | Q | Q | 2 | 3.9 | 2.8 | Q | Q | 0.9 |
| 2000 to 2003 | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| **Census Region and Division** | | | | | | | | | | |
| Northeast | 181 | 160 | 15 | Q | 4 | 27.9 | 24.7 | 2.4 | Q | 0.7 |
| New England | 74 | 68 | 5 | (*) | 1 | 41.3 | 38.2 | 2.8 | 0.1 | Q |
| Middle Atlantic | 107 | 92 | Q | Q | 4 | 22.8 | 19.6 | Q | Q | 0.8 |
| Midwest | 24 | Q | 1 | Q | 1 | 8.2 | 7.5 | 0.2 | Q | 0.5 |
| East North Central | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| West North Central | Q | Q | Q | Q | Q | 13.5 | 12.1 | 0.5 | 0.1 | Q |
| South | 15 | 10 | Q | Q | 4 | 3.2 | 2.2 | Q | Q | 0.8 |
| South Atlantic | 13 | 10 | Q | Q | 3 | 4.5 | 3.2 | Q | Q | 1.0 |
| East South Central | 1 | (*) | (*) | (*) | (*) | 2.7 | 1.2 | (*) | 1.0 | 0.5 |
| West South Central | 1 | (*) | Q | (*) | (*) | 0.5 | 0.2 | Q | (*) | 0.3 |
| West | 9 | Q | Q | Q | 1 | Q | Q | Q | Q | Q |
| Mountain | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Pacific | 4 | 2 | Q | (*) | 1 | 2.6 | 1.3 | Q | (*) | 0.4 |

# Table E9A. Fuel Oil Consumption (Btu) and Energy Intensities by End Use for All Buildings, 2003

| | Total Fuel Oil Consumption (trillion Btu) | | | | | Fuel Oil Energy Intensity (thousand Btu/square foot) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Space Heating | Water Heating | Cook-ing | Other | Total | Space Heating | Water Heating | Cook-ing | Other |
| **All Buildings** | 228 | 198 | 18 | Q | 10 | 14.0 | 12.2 | 1.1 | Q | 0.6 |
| **Climate Zone: 30-Year Average** | | | | | | | | | | |
| Under 2,000 CDD and -- | | | | | | | | | | |
| More than 7,000 HDD | 63 | 59 | 2 | Q | 2 | 23.9 | 22.4 | 0.7 | Q | 0.7 |
| 5,500-7,000 HDD | 67 | 61 | 4 | Q | 2 | 15.7 | 14.2 | 1.0 | Q | 0.4 |
| 4,000-5,499 HDD | 91 | 76 | Q | Q | 4 | 18.4 | 15.3 | Q | Q | 0.7 |
| Fewer than 4,000 HDD | 6 | 2 | Q | Q | 2 | 2.4 | 0.9 | Q | Q | 0.9 |
| 2,000 CDD or More and -- | | | | | | | | | | |
| Fewer than 4,000 HDD | 1 | Q | Q | (*) | 1 | 0.5 | 0.2 | Q | (*) | 0.3 |
| **Number of Establishments** | | | | | | | | | | |
| One | 183 | 161 | 14 | Q | 7 | 19.8 | 17.5 | 1.5 | Q | 0.7 |
| 2 to 5 | 31 | 26 | 3 | (*) | 2 | 10.9 | 9.1 | 1.0 | (*) | 0.8 |
| 6 to 10 | 7 | 6 | Q | Q | (*) | 10.2 | 8.5 | Q | Q | 0.4 |
| 11 to 20 | Q | Q | Q | Q | Q | 2.9 | Q | Q | (*) | Q |
| More than 20 | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Currently Unoccupied | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| **Energy Sources (more than one may apply)** | | | | | | | | | | |
| Electricity | 228 | 198 | 18 | Q | 10 | 14.0 | 12.2 | 1.1 | Q | 0.6 |
| Natural Gas | 101 | 83 | 10 | Q | 7 | 8.9 | 7.4 | 0.9 | Q | 0.6 |
| Fuel Oil | 228 | 198 | 18 | Q | 10 | 14.0 | 12.2 | 1.1 | Q | 0.6 |
| District Heat | 1 | Q | Q | Q | 1 | 0.7 | Q | Q | Q | 0.5 |
| **Energy End Uses (more than one may apply)** | | | | | | | | | | |
| Buildings with Space Heating | 225 | 198 | 15 | Q | 10 | 14.0 | 12.4 | 1.0 | Q | 0.6 |
| Buildings with Cooling | 181 | 155 | 15 | Q | 9 | 12.1 | 10.4 | 1.0 | Q | 0.6 |
| Buildings with Water Heating | 218 | 189 | 18 | Q | 9 | 13.9 | 12.1 | 1.2 | Q | 0.6 |
| **Annual Consumption (gallons)** | | | | | | | | | | |
| 1,000 or Less | 14 | 10 | Q | Q | 3 | 1.5 | 1.1 | Q | Q | 0.3 |
| 1,001 to 5,000 | 45 | 39 | Q | Q | 3 | 14.5 | 12.6 | Q | Q | 1.0 |
| 5,001 to 10,000 | 29 | 25 | Q | (*) | Q | 31.0 | 26.4 | Q | 0.1 | 1.3 |
| 10,001 to 25,000 | 31 | 29 | (*) | (*) | 1 | 31.0 | 29.5 | 0.5 | 0.1 | 1.0 |
| Over 25,000 | 110 | 95 | 12 | Q | 2 | 49.8 | 43.1 | 5.2 | Q | 0.9 |

See "Guide to the Tables" or "Glossary" for further explanations of the terms used in this table. Both can be accessed from the CBECS web site - http://www.eia.doe.gov/emeu/cbecs.

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

Q=Data withheld because fewer than 20 buildings were sampled for any cell, or because the Relative Standard Error (RSE) was greater than 50 percent for a cell in the "Total" column.

Note: Due to rounding, data may not sum to totals.

Source: Energy Information Administration, Office of Energy Markets and End Use, Form EIA-871A, C, and E of the 2003 Commercial Buildings Energy Consumption Survey.

Released: September, 2008

# Table E10A. Fuel Oil Consumption (gallons) and Energy Intensities by End Use for All Buildings, 2003

| | Total Fuel Oil Consumption (million gallons) | | | | | Fuel Oil Energy Intensity (gallons/square foot) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Space Heating | Water Heating | Cook-ing | Other | Total | Space Heating | Water Heating | Cook-ing | Other |
| **All Buildings** | 1,644 | 1,429 | 131 | Q | 72 | 0.10 | 0.09 | 0.01 | Q | (*) |
| **Building Floorspace (Square Feet)** | | | | | | | | | | |
| 1,001 to 5,000 | 249 | 228 | Q | (*) | Q | 0.41 | 0.38 | Q | (*) | Q |
| 5,001 to 10,000 | 262 | 237 | Q | 1 | Q | 0.36 | 0.32 | Q | (*) | Q |
| 10,001 to 25,000 | 201 | 179 | 11 | (*) | Q | 0.19 | 0.17 | 0.01 | (*) | Q |
| 25,001 to 50,000 | 124 | 115 | Q | (*) | 4 | 0.14 | 0.13 | Q | (*) | (*) |
| 50,001 to 100,000 | 209 | 188 | 10 | Q | 7 | 0.11 | 0.10 | 0.01 | Q | (*) |
| 100,001 to 200,000 | 270 | 250 | Q | Q | 10 | 0.09 | 0.08 | Q | Q | (*) |
| 200,001 to 500,000 | 258 | 183 | Q | Q | 11 | 0.08 | 0.05 | 0.02 | Q | (*) |
| Over 500,000 | 72 | Q | Q | Q | 15 | 0.02 | Q | Q | Q | (*) |
| **Principal Building Activity** | | | | | | | | | | |
| Education | 342 | 322 | 11 | Q | Q | 0.18 | 0.17 | 0.01 | Q | (*) |
| Food Sales | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Food Service | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Health Care | 76 | 45 | 11 | Q | 18 | 0.04 | 0.02 | 0.01 | Q | 0.01 |
| Inpatient | 65 | 35 | 11 | Q | 17 | 0.04 | 0.02 | 0.01 | Q | 0.01 |
| Outpatient | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Lodging | 255 | 177 | Q | 3 | 5 | 0.12 | 0.08 | Q | (*) | (*) |
| Mercantile | 155 | Q | Q | (*) | Q | Q | Q | Q | Q | Q |
| Retail (Other Than Mall) | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Enclosed and Strip Malls | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Office | 126 | 112 | Q | Q | 11 | 0.03 | 0.03 | Q | Q | (*) |
| Public Assembly | 208 | 201 | Q | (*) | Q | 0.22 | 0.21 | Q | (*) | Q |
| Public Order and Safety | 57 | 41 | Q | (*) | Q | Q | Q | Q | Q | Q |
| Religious Worship | 130 | 129 | Q | (*) | Q | 0.29 | 0.28 | Q | (*) | Q |
| Service | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Warehouse and Storage | 66 | Q | Q | 1 | Q | 0.05 | 0.05 | Q | (*) | Q |
| Other | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Vacant | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| **Year Constructed** | | | | | | | | | | |
| Before 1920 | 273 | 253 | Q | 2 | Q | 0.28 | 0.26 | Q | (*) | Q |
| 1920 to 1945 | 396 | 325 | 68 | Q | 2 | 0.20 | 0.16 | 0.03 | Q | (*) |
| 1946 to 1959 | 347 | 323 | Q | 1 | Q | 0.16 | 0.15 | Q | (*) | Q |
| 1960 to 1969 | Q | Q | Q | Q | Q | 0.16 | 0.14 | Q | Q | (*) |
| 1970 to 1979 | 164 | 139 | 10 | Q | 14 | 0.07 | 0.06 | (*) | Q | 0.01 |
| 1980 to 1989 | 87 | 67 | 5 | Q | 15 | 0.03 | 0.02 | (*) | Q | (*) |
| 1990 to 1999 | 65 | 46 | Q | Q | 15 | 0.03 | 0.02 | Q | Q | 0.01 |
| 2000 to 2003 | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| **Census Region and Division** | | | | | | | | | | |
| Northeast | 1,302 | 1,153 | 111 | Q | 30 | 0.20 | 0.18 | 0.02 | Q | (*) |
| New England | 531 | 490 | 35 | 1 | 4 | 0.30 | 0.28 | 0.02 | (*) | Q |
| Middle Atlantic | 771 | 663 | Q | Q | 26 | 0.16 | 0.14 | Q | Q | 0.01 |
| Midwest | 172 | Q | 4 | Q | 10 | 0.06 | 0.05 | (*) | Q | (*) |
| East North Central | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| West North Central | Q | Q | Q | Q | Q | 0.10 | 0.09 | (*) | (*) | Q |
| South | 107 | 73 | Q | Q | 25 | 0.02 | 0.02 | Q | Q | 0.01 |
| South Atlantic | 96 | 69 | Q | Q | 21 | 0.03 | 0.02 | Q | Q | 0.01 |
| East South Central | 7 | 3 | (*) | 2 | 1 | 0.02 | 0.01 | (*) | 0.01 | (*) |
| West South Central | 5 | 1 | Q | (*) | 3 | (*) | (*) | Q | (*) | (*) |
| West | 64 | Q | Q | Q | 7 | Q | Q | Q | Q | (*) |
| Mountain | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Pacific | 29 | 15 | Q | (*) | 5 | 0.02 | 0.01 | Q | (*) | (*) |

# Table E10A. Fuel Oil Consumption (gallons) and Energy Intensities by End Use for All Buildings, 2003

| | Total Fuel Oil Consumption (million gallons) | | | | | Fuel Oil Energy Intensity (gallons/square foot) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Space Heating | Water Heating | Cook-ing | Other | Total | Space Heating | Water Heating | Cook-ing | Other |
| **All Buildings** | 1,644 | 1,429 | 131 | Q | 72 | 0.10 | 0.09 | 0.01 | Q | (*) |
| **Climate Zone: 30-Year Average** | | | | | | | | | | |
| Under 2,000 CDD and -- | | | | | | | | | | |
| More than 7,000 HDD | 452 | 425 | 13 | Q | 13 | 0.17 | 0.16 | (*) | Q | (*) |
| 5,500-7,000 HDD | 485 | 438 | 32 | Q | 14 | 0.11 | 0.10 | 0.01 | Q | (*) |
| 4,000-5,499 HDD | 655 | 547 | Q | Q | 26 | 0.13 | 0.11 | Q | Q | 0.01 |
| Fewer than 4,000 HDD | 44 | 17 | Q | Q | 16 | 0.02 | 0.01 | Q | Q | 0.01 |
| 2,000 CDD or More and -- | | | | | | | | | | |
| Fewer than 4,000 HDD | 7 | Q | Q | (*) | 4 | (*) | (*) | Q | (*) | (*) |
| **Number of Establishments** | | | | | | | | | | |
| One | 1,318 | 1,160 | 99 | Q | 50 | 0.14 | 0.13 | 0.01 | Q | 0.01 |
| 2 to 5 | 221 | 184 | 21 | (*) | 16 | 0.08 | 0.07 | 0.01 | (*) | 0.01 |
| 6 to 10 | 48 | 40 | Q | Q | 2 | 0.07 | 0.06 | Q | Q | (*) |
| 11 to 20 | Q | Q | Q | Q | Q | 0.02 | Q | Q | (*) | Q |
| More than 20 | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Currently Unoccupied | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| **Energy Sources (more than one may apply)** | | | | | | | | | | |
| Electricity | 1,642 | 1,428 | 131 | Q | 72 | 0.10 | 0.09 | 0.01 | Q | (*) |
| Natural Gas | 727 | 602 | 73 | Q | 48 | 0.06 | 0.05 | 0.01 | Q | (*) |
| Fuel Oil | 1,644 | 1,429 | 131 | Q | 72 | 0.10 | 0.09 | 0.01 | Q | (*) |
| District Heat | 10 | Q | Q | Q | 6 | 0.01 | Q | Q | Q | (*) |
| **Energy End Uses (more than one may apply)** | | | | | | | | | | |
| Buildings with Space Heating | 1,619 | 1,429 | 111 | Q | 69 | 0.10 | 0.09 | 0.01 | Q | (*) |
| Buildings with Cooling | 1,303 | 1,120 | 107 | Q | 65 | 0.09 | 0.07 | 0.01 | Q | (*) |
| Buildings with Water Heating | 1,575 | 1,365 | 131 | Q | 67 | 0.10 | 0.09 | 0.01 | Q | (*) |
| **Annual Consumption (gallons)** | | | | | | | | | | |
| 1,000 or Less | 98 | 75 | Q | Q | 20 | 0.01 | 0.01 | Q | Q | (*) |
| 1,001 to 5,000 | 323 | 281 | Q | Q | 22 | 0.10 | 0.09 | Q | Q | 0.01 |
| 5,001 to 10,000 | 210 | 178 | Q | (*) | Q | 0.22 | 0.19 | Q | (*) | 0.01 |
| 10,001 to 25,000 | 221 | 211 | 3 | 1 | 7 | 0.22 | 0.21 | (*) | (*) | 0.01 |
| Over 25,000 | 792 | 685 | 83 | Q | 15 | 0.36 | 0.31 | 0.04 | Q | 0.01 |

See "Guide to the Tables" or "Glossary" for further explanations of the terms used in this table. Both can be accessed from the CBECS web site - http://www.eia.doe.gov/emeu/cbecs.

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

Q=Data withheld because fewer than 20 buildings were sampled.

Note: Due to rounding, data may not sum to totals.

Source: Energy Information Administration, Office of Energy Markets and End Use, Form EIA-871A, C, and E of the 2003 Commercial Buildings Energy Consumption Survey.

Released: September, 2008

# Table E11A. District Heat Consumption (Btu) and Energy Intensities by End Use for All Buildings, 2003

| | Total District Heat Consumption (trillion Btu) | | | | | District Heat Energy Intensity (thousand Btu/square foot) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Space Heating | Water Heating | Cook-ing | Other | Total | Space Heating | Water Heating | Cook-ing | Other |
| **All Buildings** | 636 | 580 | 46 | 1 | Q | 114.0 | 103.9 | 8.3 | 0.2 | Q |
| **Building Floorspace (Square Feet)** | | | | | | | | | | |
| 1,001 to 5,000 | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| 5,001 to 10,000 | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| 10,001 to 25,000 | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| 25,001 to 50,000 | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| 50,001 to 100,000 | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| 100,001 to 200,000 | 165 | 154 | 10 | Q | Q | 118.1 | 109.9 | Q | Q | Q |
| 200,001 to 500,000 | 123 | 112 | 11 | Q | Q | 121.2 | 110.2 | 10.5 | Q | Q |
| Over 500,000 | 171 | 147 | 16 | Q | Q | 93.6 | 80.6 | 8.9 | Q | Q |
| **Principal Building Activity** | | | | | | | | | | |
| Education | 134 | 122 | 8 | Q | Q | 116.6 | 106.6 | 6.9 | Q | Q |
| Food Service | N | N | N | N | N | N | N | N | N | N |
| Health Care | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Inpatient | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Outpatient | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Lodging | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Mercantile | Q | Q | Q | (*) | Q | Q | Q | Q | Q | Q |
| Retail (Other Than Mall) | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Enclosed and Strip Malls | Q | Q | Q | (*) | Q | Q | Q | Q | Q | Q |
| Office | 128 | 122 | 3 | Q | Q | 81.5 | 77.6 | 2.2 | Q | Q |
| Public Assembly | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Public Order and Safety | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Religious Worship | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Service | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Warehouse and Storage | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Other | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Vacant | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| **Year Constructed** | | | | | | | | | | |
| Before 1920 | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| 1920 to 1945 | 129 | 117 | 7 | Q | Q | 107.0 | 96.8 | 6.1 | Q | Q |
| 1946 to 1959 | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| 1960 to 1969 | 117 | 105 | Q | Q | Q | 137.6 | 122.5 | Q | Q | Q |
| 1970 to 1979 | 77 | 66 | 10 | Q | Q | 131.7 | 112.2 | 16.6 | Q | Q |
| 1980 to 1989 | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| 1990 to 1999 | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| 2000 to 2003 | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| **Census Region and Division** | | | | | | | | | | |
| Northeast | 166 | Q | 15 | Q | Q | 111.2 | Q | 9.8 | Q | Q |
| New England | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Middle Atlantic | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Midwest | 225 | 210 | 9 | Q | Q | 136.5 | 127.5 | 5.7 | Q | Q |
| East North Central | 192 | 182 | 5 | Q | Q | 135.3 | 128.2 | 3.7 | Q | Q |
| West North Central | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| South | 182 | 166 | 14 | Q | Q | 102.8 | 94.0 | 7.9 | Q | Q |
| South Atlantic | 117 | 105 | 10 | Q | Q | 94.1 | 84.8 | 8.2 | Q | Q |
| East South Central | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| West South Central | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| West | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Mountain | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Pacific | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |

# Table E11A. District Heat Consumption (Btu) and Energy Intensities by End Use for All Buildings, 2003

| | Total District Heat Consumption (trillion Btu) | | | | | District Heat Energy Intensity (thousand Btu/square foot) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Space Heating | Water Heating | Cook-ing | Other | Total | Space Heating | Water Heating | Cook-ing | Other |
| **All Buildings** | 636 | 580 | 46 | 1 | Q | 114.0 | 103.9 | 8.3 | 0.2 | Q |
| **Climate Zone: 30-Year Average** | | | | | | | | | | |
| Under 2,000 CDD and -- | | | | | | | | | | |
| - More than 7,000 HDD | 88 | 80 | 8 | Q | (*) | 106.3 | 96.7 | 9.4 | Q | (*) |
| - 5,500-7,000 HDD | 257 | 242 | 9 | Q | Q | 133.9 | 126.2 | 4.6 | Q | Q |
| - 4,000-5,499 HDD | 140 | 120 | Q | Q | Q | 103.5 | 88.9 | 12.0 | Q | Q |
| - Fewer than 4,000 HDD | 101 | 90 | 10 | Q | (*) | 98.1 | 88.2 | 9.8 | Q | (*) |
| 2,000 CDD or More and -- | | | | | | | | | | |
| - Fewer than 4,000 HDD | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| **Number of Establishments** | | | | | | | | | | |
| One | 384 | 348 | 30 | Q | Q | 125.3 | 113.6 | 9.9 | Q | Q |
| 2 to 5 | 156 | 142 | Q | Q | Q | 119.6 | 109.1 | Q | Q | Q |
| 6 to 10 | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| 11 to 20 | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| More than 20 | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| Currently Unoccupied | Q | Q | Q | Q | Q | Q | Q | Q | Q | Q |
| **Energy Sources (more than one may apply)** | | | | | | | | | | |
| Electricity | 636 | 580 | 46 | 1 | Q | 114.0 | 103.9 | 8.3 | Q | Q |
| Natural Gas | 306 | 271 | 27 | Q | Q | 118.9 | 105.3 | 10.5 | Q | Q |
| Fuel Oil | 179 | 154 | 20 | Q | Q | 96.0 | 82.7 | 11.0 | Q | Q |
| District Heat | 636 | 580 | 46 | 1 | Q | 114.0 | 103.9 | 8.3 | 0.2 | Q |
| **Energy End Uses (more than one may apply)** | | | | | | | | | | |
| Buildings with Space Heating | 635 | 580 | 46 | 1 | Q | 115.3 | 105.2 | 8.3 | 0.2 | Q |
| Buildings with Cooling | 536 | 485 | 42 | 1 | Q | 112.1 | 101.3 | 8.7 | 0.3 | Q |
| Buildings with Water Heating | 525 | 469 | 46 | 1 | Q | 110.2 | 98.4 | 9.7 | 0.3 | Q |

See "Guide to the Tables" or "Glossary" for further explanations of the terms used in this table. Both can be accessed from the CBECS web site - http://www.eia.doe.gov/emeu/cbecs.

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

Q=Data withheld because fewer than 20 buildings were sampled for any cell, or because the Relative Standard Error (RSE) was greater than 50 percent for a cell in the "Total" column.

N=No responding cases in sample that used district heat.

Note: Due to rounding, data may not sum to totals.

Source: Energy Information Administration, Office of Energy Markets and End Use, Form EIA-871A, C, and E of the 2003 Commercial Buildings Energy Consumption Survey.