



# 1998 Manufacturing Energy Consumption Survey

Sponsored by the Energy Information Administration  
U.S. Department of Energy

Administered and Compiled by the Bureau of the Census  
U.S. Department of Commerce

## Form

### EIA-846A

OMB Approval No.: 1905-0169  
Expires: 02/28/02

In correspondence pertaining to this report, please refer to the 11- digit Census File Number (CFN).

# A

Please correct errors in name, address and ZIP code. ENTER street and number if not shown.

**DUE DATE:**

If you need additional time or have questions about what to report on this questionnaire, please call our processing office on 1-800-528-3049.

Please return the completed questionnaire in the enclosed return envelope. If the envelope has been misplaced, please send to the Census Bureau address shown on the last page of the questionnaire.

**Form EIA-846A** should be completed by establishments whose first 3 digits of their **North American Industry Classification System (NAICS) code are 113, 311, 312, 313, 314, 315, 316, 323, 326, 327, 331 (except for 331111), 332, 333, 334, 335, 336, 337, 339, 511 or 512.** Government-owned establishments that are privately operated should all complete this questionnaire.

Note: the 6-digit NAICS code for this establishment is located on the mailing label above.

**Reporting Requirement:** This survey is **mandatory** under the Federal Energy Administration Act of 1974, Pub. Law No. 93-275, and under Title 3, Subtitle B, of the Omnibus Budget Reconciliation Act of 1986, Pub. Law No. 99-509, as amended by Title 1, Subtitle G, of the Energy Policy Act of 1992, Pub. Law No. 102-486. Per the Paperwork Reduction Act of 1995, you are not required to respond to any Federally-sponsored collection of information unless it displays a valid OMB Approval Number. The valid OMB Approval Number for this information collection (1905-0169) is displayed at the top left of this page.

See pages 1 through 4 for Frequently Asked Questions concerning the Manufacturing Energy Consumption Survey and instructions for completing this questionnaire.

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## Frequently Asked Questions Concerning the 1998 MANUFACTURING ENERGY CONSUMPTION SURVEY (MECS)

### Why have a MECS?

The Manufacturing Energy Consumption Survey (MECS) collects data on energy consumption and usage patterns for the manufacturing sector of the U.S. economy. The information will be used to publish aggregate statistics on the following: consumption of energy for fuel and nonfuel uses, energy characteristics of establishments in the manufacturing sector, energy consumption by end use, technologies currently in use by U.S. manufacturers, energy prices, electricity generation onsite, and participation in energy-management activities. This information will be used by the U.S. Department of Energy (DOE) to implement policy plans effectively.

### What is a manufacturing establishment?

The reporting unit for the Manufacturing Energy Consumption Survey (MECS) is the manufacturing establishment. A manufacturing establishment is an economic unit at a single physical location, for the mechanical or chemical transformation of materials or substances into new products.

An establishment is not necessarily identical to a business concern or firm, either of which may consist of one or more establishments. A company may consist of one or more establishments that are engaged in separate or distinct activities. These establishments may be situated at one location and separated physically as well as economically.

Manufacturing operations are generally conducted in facilities described as plants, factories, or mills, characteristically using power-driven machines and materials-handling equipment. Manufacturing also includes such activities as the assembly of components of manufactured products and the blending of materials such as lubricating oil, plastics, resins, or liquors.

### What should I report for?

If this establishment has previously completed the Annual Survey of Manufacturers (ASM), Form MA-1000, conducted by the U.S. Census Bureau, then the reporting boundaries for the MECS should correspond to those used for the ASM. Each reporting unit should be treated as a separate establishment ONLY if that was the determination made for the ASM. Do not consolidate ASM establishments for reporting on the MECS.

If this establishment has never completed an ASM, report for all activities that occur at this physical location, in accordance with the reporting boundaries as defined by the Census of Manufactures (CM) and as reported in the 1997 CM.

### What is NAICS?

For 1997 and subsequent reports, the North American Industry Classification System (NAICS) will replace the Standard Industrial Classification (SIC) system currently used by federal statistical agencies. NAICS is unique in that its conceptual

framework is based on production processes. Therefore, economic units that have similar production processes are classified in the same industry.

### What is the reporting period?

The period covered by this report for most establishments is calendar year 1998 (January 1 through December 31, 1998). The exception will be for those establishments whose ownership or operation changed during 1998. Indicate the reporting period covered in Section 1: Establishment Information.

### Do I have to fill out this questionnaire?

**Yes.** This survey is **mandatory** under the Federal Energy Administration Act of 1974, Pub. Law No. 93-275, and under Title 3, Subtitle B, of the Omnibus Budget Reconciliation Act of 1986, Pub. Law No. 99-509, as amended by Title 1, Subtitle G, of the Energy Policy Act of 1992, Pub. Law No. 102-486. Response is required by law from establishments included in the MECS sample and receiving the MECS questionnaire. Failure to respond may result in criminal fines, civil penalties, and other sanctions as provided by law.

### Are these data confidential?

**Yes.** Under Section 9 of Title 13, U.S. Code, your report to the Census Bureau is confidential. It may be seen only by sworn Census Bureau employees and may be used only for statistical purposes. The law also provides that copies retained in your files are immune from legal process.

### What if I have questions?

If you have any questions about what to report on this questionnaire, please call the Census Bureau at 1-800-528-3049.

### How long will this questionnaire take?

Public reporting burden for this collection of information is estimated to average eight hours per response, including the time of reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Energy Information Administration, Statistics and Methods Group, EI-70, Washington, DC 20585-0670; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

### What if I need more time to complete the questionnaire?

The questionnaire should be returned no later than the due date specified on the front. If you need additional time, please call our processing office at 1-800-528-3049.

## Instructions for Completing Form EIA-846A

### General Instructions

1. Use the units specified on the questionnaire for reporting all quantities. See page 4 for a list of British thermal units (Btu) conversion factors. If your establishment uses more precise conversion values for your operations, use them, and indicate in Section 19: Remarks, the conversion factor(s) used.
2. **Do not consolidate establishments.** The reporting boundaries for your establishment should correspond to those used in the Annual Survey of Manufactures and/or the Census of Manufactures.  
  
To resolve any consolidation problems, match the 11-digit Census File Number (CFN), which is located on the MECS questionnaire mailing label, with the CFN appearing on the ASM mailing label. Responses to MECS questions should include the same activities as those considered when responding to the matching ASM.
3. The energy sources (Sections 2 - 13) and end uses (Sections 14-15) sections of this questionnaire are designed so that all questions associated with the particular energy source within a section should be completed before going on to the next energy source. Therefore, within these sections, the questionnaire should be answered from the top of one column to the bottom of the same column, before going on to the next energy source (column).
4. Report dollar amounts rounded to the nearest dollar, e.g., report \$1,257.59 as \$1,258.
5. If you do not maintain book records for particular items, please use carefully prepared estimates.
6. Enter zeroes in the data columns if the value is zero or none.
7. Complete all applicable sections of the questionnaire.
8. The energy sources which are preprinted on the survey questionnaire are considered the most frequently consumed, but they do not represent a complete list of applicable energy sources. If your establishment has energy sources that meet the criteria for reporting, but are not preprinted on the questionnaire, please specify those energy sources in Section 13 and enter the data there. (See Reporting Criteria in the next column under Sections 2 through 13).

9. The following definitions for units are used throughout the questionnaire:

Btu = British thermal unit(s)  
One barrel = 42 gallons  
One short ton = 2,000 pounds

### Section 1: Establishment Information

In this section, indicate any changes in the establishment ownership during 1998 and indicate the period covered by this filing, whether the calendar year or other period.

### Sections 2 through 13: Energy Sources (Fuels)

#### Reporting Criteria

An energy source should be reported on this questionnaire if:

1. the energy source was consumed as a fuel, (that is, for heat, power, or electricity generation) **or**
2. the energy source was consumed as a nonfuel (feedstock, raw material input).

Data are collected for the following energy sources (fuels):

**Section 2: Electricity**

**Section 3: Steam and Industrial Hot Water**

**Section 4: Natural Gas**

**Section 5: Liquefied Petroleum Gas (LPG) and Motor Gasoline**

**Section 6: Acetylene, Hydrogen, and Waste and Byproduct Gases**

**Section 7: Diesel Fuel, Distillate Fuel Oil, and Residual Fuel Oil**

**Section 8: Kerosene and Petroleum Coke**

**Section 9: Coal** (Anthracite, Bituminous and Subbituminous, and Lignite)

**Section 10: Breeze and Coal Coke**

**Section 11: Wood** (Directly from Trees, Wood Residues and Byproducts, and Wood/Paper-related Refuse)

**Section 12: Agricultural Waste and Waste Oils and Tars**

**Section 13: Other Energy Sources**

**NOTE** - In making additional entries, the preprinted entry "Waste and Byproduct Gases" (Section 6, column 3) includes all waste gas streams (for example, refinery gas, fuel gas, vent gas, plant gas, off gas, still gas, and other waste gases) produced onsite, except hydrogen.

## Instructions for Completing Form EIA-846A, cont.

### Energy Sources, cont.

To reduce the reporting burden and eliminate unnecessary correspondence, special instructions have been developed for the reporting of byproduct (or product) energy sources. If your **only** means of supply of an energy source during 1998 was as a byproduct (or product) of an energy source used as a feedstock (or raw material input) to any of your manufacturing processes, that byproduct energy source should be reported **only if it was at least partially consumed onsite as a fuel**. If the byproduct (or product) energy source was not consumed as a fuel, it should be excluded.

### Energy-Source Reporting Examples

**Example 1** - Your establishment depended entirely on electricity for heat and power, no combustible energy sources were consumed. In this instance, complete Section 2: Electricity. No data should be entered in Sections 3 through 13. Go to Section 14 and complete the remainder of the questionnaire.

**Example 2** - Your establishment used electricity for lighting, natural gas for heating or as a feedstock, and propane for onsite transportation by forklifts. Complete the appropriate lines in Section 4 for natural gas and Section 5, column 1 for propane, in addition to Section 2.

### Sections 14 and 15:

#### Estimated End-Use Percent Consumption

These sections of the survey are intended to provide information on the purposes for which various energy sources are used in the manufacturing sector.

Section 14 covers Electricity, Total Natural Gas and Total Coal.

Section 15 covers Liquefied Petroleum Gas (LPG), Total Diesel Fuel and Distillate Fuel Oil, and Residual Fuel Oil.

See specific instructions for completing these sections at the beginning of each section.

### End-Use Reporting Examples

**Example 3** - If coal is consumed in boilers to generate steam, some of which is passed through an extractor/condensing turbine generator, all coal consumption would be reported in question 135, column 3 (Indirect Uses - Boilers).

**Example 4** - If an establishment can distinguish energy used for emissions controls, it should be reported in either question 146 or 161 (Other direct nonprocess use), depending on the energy source used.

### Section 16: Energy-Management Activities

In this section, indicate whether your establishment participated in the energy-management activities during 1998, and for selected activities, indicate the amount of the energy-management activity costs paid for by the establishment.

### Section 17: Technologies

Indicate any of the technologies present in this establishment. Listed technologies include general technologies which may be found in any manufacturing establishment, technologies related to cogeneration, and specific technologies for particular NAICS codes.

### Section 18: Establishment Size

This section asks for the number of buildings and total square footage associated with this establishment. See the specific instructions in this section for the definition of what should be counted as a building.

### Section 19: Remarks

Please provide any explanations that may be helpful to us in understanding your reported data. Indicate any Btu conversion factors used, if different from those provided on page 4. If additional space is needed, attach a separate sheet, including the 11-digit Census File Number (CFN) located on the mailing label on the front page of this questionnaire.

### Section 20: Contact Information

Enter address and other contact information for the person most knowledgeable about completing this questionnaire and the person whom we should contact if we have any questions concerning this filing.

## Btu Conversion Factors Table

Following are Btu conversion factors and other useful factors that should be used only if you do not know the actual Btu factor of the fuels consumed at your establishment site.

If your establishment uses more precise conversion values for your operations, use them in place of the approximations given below. However, please identify in Section 19: Remarks (page 46), the conversion factor(s) used, if different from those listed below.

Energy Source	Conversion Factor(s)
Acetylene	21,600 Btu/pound 1,500 Btu/cubic foot
Bagasse	4,081 Btu/pound
Biomass	5,300 Btu/pound
Breeze	19.8 million Btu/short ton
Butane	4.326 million Btu/barrel 0.10300 million Btu/gallon
Coal Coke	24.8 million Btu/short ton
Distillate Fuel Oil	5.825 million Btu/barrel
Ethane	3.082 million Btu/barrel 0.07338 million Btu/gallon
Hydrogen	61,084 Btu/pound 325.11 Btu/cubic foot 35,600 Btu/gallon
Industrial Hot Water	140 Btu/pound 7.84 pounds/gallon
Isobutane	3.974 million Btu/barrel 0.09462 million Btu/gallon
Liquefied Petroleum Gas (LPG)	3.616 million Btu/barrel 0.08610 million Btu/gallon 4.5 pounds/gallon
Natural Gas	1.027 million Btu/1,000 cubic feet 10.27 therms/1,000 cubic feet
Petroleum Coke	6.024 million Btu/barrel 30.12 million Btu/short ton 5 barrels/short ton
Propane	3.836 million Btu/barrel 0.09133 million Btu/gallon

continued in next column

Energy Source	Conversion Factor(s)
Pulping Liquor or Black Liquor	11 million Btu/short ton
Residual Fuel Oil	6.287 million Btu/barrel
Roundwood	21.5 million Btu/cord 17.2 million Btu/short ton 0.014 million Btu/board foot
Sawdust (7% Moisture)	8,000 Btu/pound
Steam	1,200 Btu/pound
Still Gas or Waste Gas or Refinery Gas	6 million Btu/barrel 1,029 Btu/cubic foot
Waste Materials (Wastepaper)	7,500 Btu/pound
Waste Oils and Tars	6 million Btu/barrel
(Green) Wood Chips (50% Moisture)	10 million Btu/short ton
Wood Waste (50% Moisture)	9 million Btu/short ton

### Other Definitions:

**Btu = British thermal unit(s)**  
**One barrel = 42 gallons**  
**One short ton = 2,000 pounds**

Examples of conversion from physical quantities to Btu include:

C Your establishment consumed 250 cubic feet of hydrogen in 1998.

The Btu equivalent is:

$$250 \text{ cu. ft.} \times 325.11 \text{ Btu per cubic foot} \\ = 81,277.50 \text{ Btu} \\ = 0.0813 \text{ million Btu}$$

C Your establishment consumed 300 pounds of hydrogen in 1998.

The Btu equivalent is:

$$300 \text{ pounds} \times 61,084 \text{ Btu per pound} \\ = 18,325,200 \text{ Btu} \\ = 18.325 \text{ million Btu}$$

## Section 1: Establishment Information

**1. Did ownership of this establishment change during 1998?**

Census use  
only  
00011

1  No **Go to question 2.**

2  Yes, Establishment was sold during the year **ö**

complete all sections of this questionnaire for activities that occurred in 1998 prior to the sale.  
Go to question 2

3  Yes, Establishment was bought during the year **ö**

complete all sections of the questionnaire for activities that occurred in 1998 after the sale.  
Go to question 2

**2. Mark the answer which best describes this establishment at the end of 1998:**

00010 1  a. In operation ..... **ö Go to question 4**

2  b. Ceased operation ..... **ö enter date:**

Month/Day/Year

**Go to question 4**

3  c. Sold or leased TO another operator ..... **ö enter date:**

Month/Day/Year

**Go to question 3**

**If none of the above, go to question 4.**

**3. Enter the following information only if this establishment was sold or leased to another operator during 1998; otherwise, go to question 4.**

**Name of new owner or operator**

**Employer Identification (EI)  
Number (9 digits)**

**Number and Street**

**City**

**State**

**ZIP Code (9 digits)**

**4. Enter the reporting period for the information reported on this questionnaire. Unless there are special circumstances like those reported above, this reporting period should be from January 1, 1998 to December 31, 1998.**

**From:**

**To:**

Month/Day/Year

Month/Day/Year

**Go to question 5, Section 2, next page**