

Glossary

Anthracite: A hard, black, lustrous coal containing a high percentage of fixed carbon and a low percentage of volatile matter. Often referred to as hard coal.

Barrel: A volumetric unit of measure equivalent to 42 U.S. gallons.

Biomass: Organic nonfossil material of biological origin constituting a renewable energy source.

Bituminous Coal: A dense, black coal, often with well-defined bands of bright and dull material, with a moisture content usually less than 20 percent. Often referred to as soft coal. It is the most common coal.

Blast Furnace: A shaft furnace in which solid fuel (coke) is burned with an air blast to smelt ore in a continuous operation.

Blast Furnace Gas: The waste combustible gas generated in a blast furnace when iron ore is being reduced with coke to metallic iron. It is commonly used as a fuel within the steel works.

Boiler Fuel: An energy source to produce heat that is transferred to the boiler vessel in order to generate steam or hot water. Fossil fuels are the primary energy sources used to produce heat for boilers.

Breeze: The fine screenings from crushed coke. Usually breeze will pass through a ½ -inch or ¾-inch screen opening. It is most often used as a fuel source in the process of agglomerating iron ore.

British Thermal Unit (Btu): The quantity of heat required to raise the temperature of 1 pound of water by 1 degree Fahrenheit.

Butane (C₄H₁₀): A normally gaseous straight-chain or branched-chain paraffinic hydrocarbon. It is extracted from natural gas or refinery gas streams. It includes isobutane and normal butane. In the manufacturing sector, a primary use of butane is in the manufacture of chemicals and rubber.

Butylene (C₄H₈): A normally gaseous, olefinic hydrocarbon recovered from the refinery processes and converted to alkylate, a high-octane motor gasoline blending component.

Byproduct: A secondary or additional product resulting from the feedstock use of energy or the processing of nonenergy materials. For example, the more common byproducts of coke ovens are coal gas, tar, and a mixture of benzene, toluene, and xylenes (BTX).

Census Division: A geographic area consisting of several States defined by the U.S. Department of Commerce, Bureau of the Census (see the map in Appendix E). The States are grouped into four regions and nine divisions.

Region	Division	States
Northeast	New England	Connecticut, Maine, Massachusetts, New Hampshire, Vermont, and Rhode Island
	Middle Atlantic	New Jersey, New York, and Pennsylvania
Midwest	East North Central	Illinois, Indiana, Michigan, Ohio, and Wisconsin
	West North Central	Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota

South	South Atlantic	Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia
	East South Central	Alabama, Kentucky, Mississippi, and Tennessee
	West South Central	Arkansas, Louisiana, Oklahoma, and Texas
West	Mountain	Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming
	Pacific	Alaska, California, Hawaii, Oregon, and Washington

Census Region: See **Census Division** and the map in Appendix E.

Coal: See **Anthracite**, **Bituminous Coal**, and **Lignite**.

Coal Coke: A hard, porous product made from baking bituminous coal in ovens at temperatures as high as 2,000 degrees Fahrenheit. It is used both as a fuel and as a reducing agent in smelting iron ore in a blast furnace.

Cogeneration: The production of electrical energy and another form of useful energy (such as heat or steam) through the sequential use of energy.

Coke Oven Gas: The mixture of permanent gases produced by the carbonization of coal in a coke oven at temperatures in excess of 1,000 degrees Celsius.

Consumption: The use of energy as a source of heat or power or as an input to the manufacturing process.

Conventional Electricity Generation: Thermal generation of electricity by a plant using coal, petroleum, or natural gas as its source of energy, or hydroelectric generation of electricity by a plant using natural stream flow as regulated by available storage. In this report, conventional electricity generation is the direct nonprocess end use that includes fossil fuel used in electric generators for which steam is not an intermediate input. If intermediate energy sources are used, as in cogeneration, the fossil fuel is counted as boiler fuel (i.e., an indirect use).

Conversion Factor: A number that translates units of one system into corresponding values of another system. Conversion factors are used to translate physical units of measure for various energy sources into their Btu equivalents.

Crude Oil: A mixture of hydrocarbons that exists in a liquid state in natural underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities. Crude oil is reported as liquid equivalents at the surface (excluding basic sediment and water), measured in terms of barrels of 42 U.S. gallons at atmospheric pressure and corrected to 60 degrees Fahrenheit.

Demand-Side Management (DSM): A term used to describe a variety of programs sponsored by utility companies to encourage customers to modify their energy use. In general, DSM programs are designed to reduce demand or to modify patterns of demand as an alternative to adding new capacity.

Direct Nonprocess End Use: Those end uses that may be found on commercial, residential, or other sites, as well as at manufacturing establishments. They include heating, ventilation, and air conditioning (HVAC), facility lighting, facility support, onsite transportation, conventional electricity generation, and other nonprocess uses. "Direct" denotes that only the quantities of electricity or fossil fuel used in their original state (i.e., not transformed) are included in the estimates.

Direct Process End Use: Those end uses that are specific to the carrying out of manufacturing. They include process heating, process cooling and refrigeration, machine drive, electrochemical processes, and other process uses. "Direct" denotes that only the quantities of electricity or fossil fuel used in their original state (i.e., not transformed) are included in the estimates. See **Manufacturing Establishment**.

Distillate Fuel Oil: The general classification for light fuel oils distilled during the refining process. The classification includes products known as Nos. 1, 2, and 4 fuel oils and Nos. 1, 2, and 4 diesel fuels. Distillate fuel oil is used primarily for space heating, on-and-off highway engine fuel, and electric power generation.

Durable Goods: Manufactured goods designed to be durable, such as appliances.

Electricity: A form of energy generated by friction, induction, or chemical change that is caused by the presence and motion of elementary charged particles of which matter consists.

Electricity Demand: Electricity demand is the amount of electricity actually consumed onsite, regardless of where or how it was produced. It is a useful measure of electricity consumption without regard to the consumption of other energy sources. Electricity demand is estimated as the sum of electricity purchases, transfers in, and total onsite generation minus the quantities of electricity sold or transferred offsite.

Electric Utility: A legal entity engaged in the generation, transmission, distribution, or sale of electric energy, primarily for use by the public; legally obligated to provide service to the public within its franchised area; and required to file forms listed in the *Code of Federal Regulations*, Title 18, Part 141. Independent power producers and facilities that qualify as cogenerators or small power producers under the Public Utility Regulatory Policies Act are not considered electric utilities. See **Nonutility Power Producers**.

Electrochemical Process: The direct process end use in which electricity is used to cause a chemical transformation. Major uses of electrochemical process occur in the aluminum industry in which alumina is reduced to molten aluminum metal and oxygen, and in the alkalis and chlorine industry, in which brine is separated into caustic soda, chlorine, and hydrogen.

Embodied Energy for Electricity: The energy electricity suppliers use to generate the electricity consumed at the site. See **First Use of Energy for All Purposes**.

End Use: A use for which total input energy for heat, power, and electricity generation is consumed at the manufacturing establishment. In end-use estimates presented in this report, nonfuel uses of energy sources are not considered. End uses in this report include three broad categories: indirect uses, direct uses, and direct nonprocess.

Energy: The capacity for doing work as measured in the capability of doing work (potential energy) or the conversion of this capability to motion (kinetic energy).

Energy Source: A substance, such as natural gas, coal, or electricity, that supplies heat or power.

Establishment: As defined by the *Standard Industrial Classification Manual 1987*, "... an economic unit, generally at a single physical location, where business is conducted or where services or industrial operations are performed." See **Manufacturing Establishment**.

Ethane (C₂H₆): A normally gaseous paraffinic hydrocarbon extracted from natural gas or refinery gas streams. In the manufacturing sector, ethane is used primarily as a petrochemical feedstock for the production of chemicals and plastic materials.

Ethylene (C₂H₄): A normally gaseous, colorless, flammable olefinic hydrocarbon recovered from natural gas and petroleum. In the manufacturing sector, ethylene is used primarily as a petrochemical feedstock for numerous chemical applications and the production of consumer goods.

Expenditures: Funds spent for energy purchased and paid for or delivered to a manufacturer during a calendar year. For the purposes of the MECS, expenditures include State and local taxes and delivery charges.

Facility Heating, Ventilation, and Air Conditioning (HVAC): The direct nonprocess end use that includes energy use in systems that condition air in a building.

Facility Lighting: The direct nonprocess end use that includes energy used in equipment that illuminates buildings and other areas on the establishment site.

Facility Support: The direct nonprocess end use that includes energy used in diverse applications that are normally associated with office or building operations such as cooking in cafeterias; operation of office equipment such as personal computers and copying machines; and operation of elevators.

First Use of Energy for All Purposes: All energy consumed by end users, excluding electricity but including the energy consumed at electric utilities to generate electricity.

Fossil Fuel: Any naturally occurring organic fuel formed in the Earth's crust, such as coal, crude oil, and natural gas.

Fuel: Any substance that can be burned to produce heat or power.

Fuel-Switching Capability: The short-term capability of a manufacturing establishment to have used substitute energy sources in place of those actually consumed. Capability to use substitute energy sources means that the establishment's combustors (for example, boilers, furnaces, ovens, and blast furnaces) had the machinery or equipment either in place or available for installation so that substitutions could actually have been introduced within 30 days without extensive modifications. Fuel-switching capability does not depend on the relative prices of energy sources; it depends only on the characteristics of the equipment and certain legal constraints.

Generation: The process of producing steam or electrical energy by transforming other forms of energy.

Geothermal Energy (as used at electricity generating facilities): Hot water or steam, extracted from reservoirs in the Earth's crust and supplied to steam turbines that drive generators to produce electricity.

Hydroelectric Power: Electricity generated by a turbine driven by falling water.

Hydrogen: A colorless, odorless, highly flammable gaseous element; the lightest of all gases.

Indirect Uses (end-use category): The end-use category that handles boiler fuel. Fuel in boilers is transformed into another useful energy source, steam or hot water, which is in turn used in other end uses, such as process or space heating or electricity generation. Manufacturers find measuring quantities of steam as it passes through to various end uses especially difficult because variations in both temperature and pressure affect energy content. Thus, the MECS does not present end-use estimates of steam or hot water and shows only the amount of the fuel used in the boiler to produce those secondary energy sources.

Industrial Sector: Comprises manufacturing industries that make up the largest part of the sector along with mining, construction, agriculture, fisheries, and forestry. Establishments in this sector range from steel mills, to small farms, to companies assembling electronic components. The SIC codes used to classify establishments as industrial are 1 through 39.

Kilowatthour (kWh): A unit of work or energy, measured as 1,000 watts (1 kilowatt) of power expended for 1 hour. Once generated, one kWh is equivalent to 3,412 Btu.

Lease Condensate: A natural gas liquid recovered from gas-well gas (associated and nonassociated) in lease separators or field facilities. Lease condensate consists primarily of pentanes and heavier hydrocarbons. Volumes are reported in terms of barrels of 42 U.S. gallons at atmospheric pressure and corrected to 60 degrees Fahrenheit.

Lease Separator: A facility located at the surface for the purposes of (1) separating casinghead gas from produced crude oil and water at the temperature and pressure conditions of the separator; and (2) separating gas from that portion of associated gas and nonassociated gas that liquefies at the temperature and pressure conditions of the separator.

Lignite: A brownish-black coal with a high percentage of inherent moisture and volatile matter content. Often referred to as brown coal.

Liquefied Petroleum Gases (LPG): 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 plant liquids.

Local Distribution Company (LDC): A legal entity engaged primarily in the retail sale and/or delivery of natural gas through a distribution system that includes mainlines (that is, pipelines designed to carry large volumes of gas, usually located under roads or other major right-of-ways) and laterals (that is, pipelines of smaller diameter that connect the end user to the

mainline). Since the restructuring of the gas industry, the sale of gas and/or delivery arrangements may be handled by other agents, such as producers, brokers, and marketers that are referred to as “non-LDC.”

Machine Drive (Motors): The direct process end use in which thermal or electric energy is converted into mechanical energy. Motors are found in almost every process in manufacturing. Therefore, when motors are found in equipment that is wholly contained in another end use (such as process cooling and refrigeration), the energy is classified there rather than in machine drive.

Manufacturing Division: One of 10 fields of economic activity defined by the *Standard Industrial Classification Manual*. The manufacturing division includes all establishments engaged in the mechanical or chemical transformation of materials or substances into new products. The other divisions of the U.S. economy are agriculture, forestry, fishing, hunting, and trapping; mining; construction; transportation, communications, electric, gas, and sanitary services; wholesale trade; retail trade; finance, insurance, and real estate; personal, business, professional, repair, recreation, and other services; and public administration. The establishments in the manufacturing division constitute the universe for the MECS.

Manufacturing Establishment: An economic unit at a single physical location where mechanical or chemical transformations of materials or substances into new products are performed. Manufacturing operations are generally conducted in facilities described as plants, factories, or mills, and characteristically use power-driven machines and materials-handling equipment. In addition, the assembly of components of manufactured products is considered manufacturing, as in the blending of materials, such as lubricating oils, plastics, resins, or liquors. See **Establishment**.

Motor Gasoline: A complex mixture of relatively volatile hydrocarbons, with or without small quantities of additives, obtained by blending appropriate refinery streams to form a fuel suitable for use in spark-ignition engines. Motor gasoline includes both leaded and unleaded grades of finished motor gasoline, blending components, and gasohol.

Natural Gas: A mixture of hydrocarbon compounds and small quantities of various nonhydrocarbons existing in the gaseous phase or in solution with crude oil in natural underground reservoirs at reservoir conditions. Natural gas may be subclassified as:

1. **Associated Gas:** Free natural gas, commonly known as gas-cap gas, that overlies and is in contact with crude oil in the reservoir.
2. **Dissolved Gas:** Natural gas that is in solution with crude oil in the reservoir at reservoir conditions.
3. **Nonassociated Gas:** Free natural gas that is not in contact with crude oil in the reservoir.

All natural gas volumes are reported in cubic feet at a pressure base of 14.73 pounds per square inch at 60 degrees Fahrenheit.

Natural Gas Liquids (NGL): Those portions of reservoir gas that are liquefied at the surface in field facility or gas processing plants. Some examples are ethane, propane, butanes, pentanes, natural gasoline, and condensate.

Natural Gas Utility: See **Local Distribution Company (LDC)**.

Net Electricity: Net electricity is estimated for each manufacturing establishment as the sum of purchased electricity, transfers in, and generation from noncombustible renewable resources minus the quantities of electricity sold and transferred offsite. Thus net electricity excludes the quantities of electricity generated or cogenerated onsite from combustible energy sources.

Nondurable Goods: Manufactured goods not designed to last, such as food.

Nonfuel Use (of energy): Use of energy as feedstock or raw material input.

Nonprocess Use: See **Direct Nonprocess End Use**.

Nonutility Power Producer: A legal entity that owns electric generating capacity and is not an electric utility. Includes qualifying cogenerators, qualifying small power producers, and other nonutility generators (including independent power

producers) with a franchised area and not required to file forms listed in the *Code of Federal Regulations*, Title 18, Part 141. See **Electric Utility**.

North American Industrial Classification System (NAICS): A new classification scheme, developed by the Office of Management and Budget to replace the Standard Industrial Classification (SIC) System, that categorizes establishments according to the types of production processes they primarily use.

Offsystem (natural gas): Natural gas that is transported to the end user by the company making final delivery of the gas to the end user. The end user purchases the gas from another company, such as a producer or marketer, not from the delivering company (typically a local distribution company or a pipeline company).

Onsite Transportation: The direct nonprocess end use that includes energy used in vehicles and transportation equipment that primarily consume energy within the boundaries of the establishment. Energy used in vehicles that are found primarily offsite, such as delivery trucks, is not measured by the MECS.

Onsystem (natural gas): Natural gas that is sold (and transported) to the end user by the company making final delivery of the gas to the end user. Companies that make final delivery of natural gas are typically local distribution companies or pipeline companies.

Open-Access Transportation Service: Transportation service, provided by interstate natural gas pipeline companies, that is nondiscriminatory. That is, the pipeline company must provide the same transportation services to any credit-worthy customer (subject to the availability of capacity), whether the customer purchases natural gas from the pipeline company or not.

Petrochemical Feedstock: Chemical feedstocks derived from petroleum and used principally for the manufacture of chemicals, synthetic rubber, and a variety of plastics.

Petroleum Coke: A solid residue, high in carbon content and low in hydrogen, which is the final product of thermal decomposition in the condensation process in cracking crude oil. Petroleum coke can yield almost pure carbon or artificial graphite suitable for the production of carbon or graphite electrodes, structural graphite, motor brushes, dry cells, and similar products.

Plant: Commonly used as a synonym for an establishment. However, the term can also be used to refer to a particular process within an establishment.

Process Cooling and Refrigeration: The direct process end use in which energy is used to lower the temperature of substances involved in the manufacturing process. Examples include freezing processed meats for later sale in the food industry and lowering the temperature of chemical feedstocks below ambient temperature for use in reactions in the chemical industries. Not included are uses such as air-conditioning for personal comfort and cafeteria refrigeration. See **Manufacturing Establishment**.

Process Heating: The direct process end use in which energy is used to raise the temperature of substances involved in the manufacturing process. Examples are many and include the use of heat to melt scrap for electric-arc furnaces in steel-making, to separate components of crude oil in petroleum refining, to dry paint in automobile manufacturing, and to cook packaged foods. Not included are heat used for heating of buildings or for cafeteria and personal cooking. See **Manufacturing Establishment**.

Process Use: See **Direct Process End Use**.

Propane (C₃H₈): A normally gaseous, straight-chain, paraffinic hydrocarbon extracted from natural gas or refinery gas streams. In the manufacturing sector, it is used as a petrochemical feedstock.

Propylene (C₃H₆): A normally gaseous olefinic hydrocarbon recovered from refinery processes or petrochemical processes. In the manufacturing sector, propylene is used primarily as a petrochemical feedstock.

Public Utility Regulatory Policies Act of 1978 (PURPA): One part of the National Energy Act of 1978, this legislation contains measures designed to encourage the conservation of energy, more efficient use of resources, and equitable rates.

Principal among those measures were suggested retail rate reforms and new incentives for production of electricity by cogenerators and users of renewable resources. The authority for implementing several key PURPA programs is held by an independent regulatory agency within the U.S. Department of Energy.

Pulping Liquor (Black Liquor): The alkaline spent liquor removed from the digesters in the process of chemically pulping wood. After evaporation, the liquor is burned as a fuel in a recovery furnace that permits the recovery of certain basic chemicals.

Quadrillion Btu: Equivalent to 10^{15} Btu.

Real Dollars: Real dollars are currency in terms of the goods and services the currency can buy. In essence, real dollars are dollars that have been adjusted for inflation. In this report, 1991 and 1994 dollars were first converted to real 1992 dollars by dividing, or “deflating,” the nominal dollars by the chain-type price indices for gross domestic product for 1991 and 1994, respectively. Then, because real 1994 dollars were used, the real 1992 dollars were divided by the 1994 price index.

Refinery: A plant, device, or process that heats crude oil so that it separates into chemical components, which are then distilled off as more usable substances.

Relative Standard Error (RSE): A percentage measure of the precision of a survey statistic. The RSE is defined as the standard error of a survey estimate divided by the survey estimate and multiplied by 100. The standard error is the square root of the variance.

Renewable Energy: Energy obtained from essentially inexhaustible sources, which are not necessarily combustible. Combustible sources of renewable energy include wood harvested directly from trees, tree bark, and wood waste. Noncombustible sources include solar power, wind power, hydropower, and geothermal power.

Residual Fuel Oil: The general classification for the heavier oils that remain after the distillate fuel oils and lighter hydrocarbons are distilled away in refinery operations. The classification includes No. 5 (light and heavy), No. 6 (including heavy-grade, so called Bunker C oil), and Navy Special fuel oil.

Roundwood: Wood cut specifically for use as a fuel.

Short Ton: A unit of weight equal to 2,000 pounds.

Solar Energy: The radiant energy of the sun, which can be converted into other forms of energy, such as heat or electricity.

Spot Market (natural gas): A market in which natural gas is bought and sold for immediate or very near-term delivery, usually for a period of 30 days or less. The transaction does not imply a continuing arrangement between the buyer and the seller. A spot market is more likely to develop at a location with numerous pipeline interconnections, thus allowing for a large number of buyers and sellers. The Henry Hub in southern Louisiana is the best known spot market for natural gas.

Standard Industrial Classification (SIC): A classification scheme, developed by the Office of Management and Budget, that categorizes establishments according to the types of goods they primarily produce.

Still Gas (refinery gas): Any form or mixture of gases produced in refineries by distillation, cracking, reforming, and other processes, the principal constituents of which are hydrogen, methane, ethane, ethylene, propane, propylene, butanes, butylene, etc. Still gas is used as a petrochemical feedstock and as a fuel in refineries.

Storage Capacity: Includes, for the purposes of the MECS, any volumetric capacity (including tank tops and tank bottoms) that is on the establishment site even if it is dedicated or leased for the storage of an energy source by other establishments.

Subbituminous Coal: A dull, black coal of intermediate rank between lignite and bituminous coal. Subbituminous coal, like bituminous coal, is used as a fuel.

Total Inputs of Energy for Heat, Power, and Electricity Generation: Use of energy in the production of heat, steam, power, or the generation of electricity.

Turbine: A machine for generating rotary mechanical power from the energy of a stream of fluid (such as water, steam, or hot gas). Turbines convert kinetic energy to mechanical energy through the principles of impulse and reaction or a mixture of the two.

Waste Materials: Otherwise discarded combustible materials that, when burned, produce energy for such purposes as space heating and electric power generation. The size of the waste may be reduced by shredders, grinders, or hammermills. Noncombustible materials, if any, may be removed. The waste may be dried and then burned, either alone or in combination with fossil fuels.

Waste Oils and Tar: Petroleum-based materials that are worthless for any purpose other than fuel use.

Wind Energy: Energy present in wind motion that can be converted to mechanical energy for driving pumps, mills, and electric power generators. Wind pushes against sails, vanes, or blades radiating from a central rotating shaft.

Wood Energy: Wood and wood products used as fuel, including round wood (cord wood), limb wood, wood chips, bark, sawdust, forest residues, charcoal, pulp waste, and spent pulping liquor.

Wood Waste: Wood byproducts used as a fuel. Included are limb wood, wood chips, bark, sawdust, forest residues, charcoal, and pulp waste.