Energy Types

Biomass:

* Biomass is organic material that comes from plants and animals, and it is a renewable source of energy.
* Examples of Biomass:
  + Wood and wood processing wastes—burned to heat buildings, to produce process heat in industry, and to generate electricity
  + Agricultural crops and waste materials—burned as a fuel or converted to liquid biofuels
  + Food, yard, and wood waste in garbage—burned to generate electricity in power plants or converted to biogas in landfills
  + Animal manure and human sewage—converted to biogas, which can be burned as a fuel
* Biomass fuels provided about 5% of total primary energy use in the United States in 2017. Of that 5%, about 47% was from biofuels (mainly ethanol), 44% was from wood and wood-derived biomass, and 10% was from the biomass in municipal waste. (Sum of percentages is greater than 100% because of independent rounding) Researchers are trying to develop ways to use more biomass for fuel.

Coal:

* Coal is a combustible black or brownish-black sedimentary rock with a high amount of carbon and hydrocarbons. Coal is classified as a nonrenewable energy source because it takes millions of years to form. Coal contains the energy stored by plants that lived hundreds of millions of years ago in swampy forests.

Distillate Fuel Oil:

* A general classification for one of the petroleum fractions produced in conventional distillation operations. It includes diesel fuels and fuel oils. Products known as No. 1, No. 2, and No. 4 diesel fuel are used in on-highway diesel engines, such as those in trucks and automobiles, as well as off-highway engines, such as those in railroad locomotives and agricultural machinery. Products known as No. 1, No. 2, and No. 4 fuel oils are used primarily for space heating and electric power generation.

HGL:

* Natural gas and crude oil are mixtures of different hydrocarbons. [Hydrocarbons](https://www.eia.gov/tools/glossary/index.php?id=Hydrocarbon) are molecules of carbon and hydrogen in various combinations. [*Hydrocarbon gas liquids* (HGL)](https://www.eia.gov/tools/glossary/index.php?id=Hydrocarbon%20gas%20liquids) are hydrocarbons that occur as gases at atmospheric pressure and as liquids under higher pressures. HGL can also be liquefied by cooling. The specific pressures and temperatures at which the gases liquefy vary by the type of HGL. HGL may be described as being *light* or *heavy* according to the number of carbon atoms and hydrogen atoms in an HGL molecule.
* Examples: ethane, propane, butane, ethylene, propylene, butylene

Hydroelectric Power:

* People have a long history of using the force of water flowing in streams and rivers to produce mechanical energy. Hydropower was one of the first sources of energy used for electricity generation and and until 2019, hydropower was the largest source of total annual U.S. renewable electricity generation.
* Because the source of hydroelectric power is water, hydroelectric power plants are usually located on or near a water source. The volume of the water flow and the change in elevation—or fall, and often referred to as *head*—from one point to another determine the amount of available energy in moving water. In general, the greater the water flow and the higher the head, the more electricity a hydropower plant can produce.

Jet Fuel:

* A kerosene-based product having a maximum distillation temperature of 400 degrees Fahrenheit at the 10-percent recovery point and a final maximum boiling point of 572 degrees Fahrenheit and meeting ASTM Specification D 1655 and Military Specifications MIL-T-5624P and MIL-T-83133D (Grades JP-5 and JP-8). It is used for commercial and military turbojet and turboprop aircraft engines.

Motor Fuel:

* Gasoline is a fuel made from crude oil and other petroleum liquids. Gasoline is mainly used as an engine fuel in vehicles. Petroleum refineries and blending facilities produce motor gasoline for sale at retail gasoline fueling stations.

Natural Gas:

* Natural gas is a fossil energy source that formed deep beneath the earth's surface. Natural gas contains many different compounds. The largest component of natural gas is methane, a compound with one carbon atom and four hydrogen atoms (CH4). Natural gas also contains smaller amounts of [natural gas liquids](https://www.eia.gov/tools/glossary/index.php?id=Natural%20Gas%20Liquids) (NGL, which are also [hydrocarbon gas liquids](https://www.eia.gov/energyexplained/hydrocarbon-gas-liquids/)), and nonhydrocarbon gases, such as carbon dioxide and water vapor. We use natural gas as a fuel and to make materials and chemicals.
* In some places, natural gas moved into large cracks and spaces between layers of overlying rock. The natural gas found in these types of formations is sometimes called [*conventional natural gas*](https://www.eia.gov/tools/glossary/index.php?id=Conventional%20oil%20and%20natural%20gas%20production). In other places, natural gas occurs in the tiny pores (spaces) within some formations of shale, sandstone, and other types of sedimentary rock. This natural gas is referred to as *shale gas* or *tight gas*, and it is sometimes called [*unconventional natural gas*](https://www.eia.gov/tools/glossary/index.php?id=Unconventional%20oil%20and%20natural%20gas%20production). Natural gas also occurs with deposits of crude oil, and this natural gas is called [*associated natural gas*](https://www.eia.gov/tools/glossary/index.php?id=Associated%20natural%20gas). Natural gas deposits are found on land, and some are offshore and deep under the ocean floor. A type of natural gas found in coal deposits is called *coalbed methane*.

Nuclear Electric Power:

* [Atoms](https://www.eia.gov/energyexplained/electricity/the-science-of-electricity.php) are the tiny particles in the molecules that make up gases, liquids, and solids. Atoms themselves are made up of three particles called protons, neutrons, and electrons. An atom has a nucleus (or core) containing protons and neutrons, which is surrounded by electrons. Protons carry a positive electrical charge, and electrons carry a negative electrical charge. Neutrons do not have an electrical charge. Enormous energy is present in the bonds that hold the nucleus together. This nuclear energy can be released when those bonds are broken. The bonds can be broken through nuclear fission, and this energy can be used to produce electricity.
* About 20% of electricity in the US comes from nuclear energy.

Other Petroleum:

* Other mixtures of hydrocarbons from crude oil.

Other Renewables:

* Renewables that are NOT hydroelectric power or biomass. Other renewable sources include: geothermal, solar, and wind energy.

Residual Fuel:

* A general classification for the heavier oils, known as No. 5 and No. 6 fuel oils, that remain after the distillate fuel oils and lighter hydrocarbons are distilled away in refinery operations. It conforms to ASTM Specifications D 396 and D 975and Federal Specification VV-F-815C. No. 5, a residual fuel oil of medium viscosity, is also known as Navy Special and is defined in Military Specification MIL-F-859E, including Amendment 2 (NATO Symbol F-770). It is used in steam-powered vessels in government service and inshore powerplants. No. 6 fuel oil includes Bunker C fuel oil and is used for the production of electric power, space heating, vessel bunkering, and various industrial purposes.

Other Notes and Classifications:

* Renewable Energy Types:
  + Biomass
  + Hydroelectric
  + Other Renewables
    - Solar
    - Wind
    - geothermal
* Non-Renewable Energy Types:
  + Distillate Fuel Oils
  + HGL
  + Jet Fuel
  + Motor Fuel
  + Other Petroleum
  + Residual Fuel Oil
  + Nuclear Electric Power
  + Natural Gas
  + Coal
* Energy Types from Crude Oil:
  + Distillate Fuel Oils
  + HGL
  + Jet Fuel
  + Motor Fuel
  + Other Petroleum
  + Residual Fuel Oil
* BTUs (British Thermal Units): defined as the amount of energy required to raise one pound of water, one degree celcius.

Energy Sectors

* **Commercial sector:**  An energy-consuming sector that consists of service-providing facilities and equipment of businesses; Federal, State, and local governments; and other private and public organizations, such as religious, social, or fraternal groups. The commercial sector includes institutional living quarters. It also includes sewage treatment facilities. Common uses of energy associated with this sector include space heating, water heating, air conditioning, lighting, refrigeration, cooking, and running a wide variety of other equipment. Note: This sector includes generators that produce electricity and/or useful thermal output primarily to support the activities of the above-mentioned commercial establishments.
* An energy-consuming sector that consists of living quarters for private households. Common uses of energy associated with this sector include space heating, water heating, air conditioning, lighting, refrigeration, cooking, and running a variety of other appliances. The residential sector excludes institutional living quarters. Note: Various EIA programs differ in sectoral coverage.
* An energy-consuming sector that consists of all vehicles whose primary purpose is transporting people and/or goods from one physical location to another. Included are automobiles; trucks; buses; motorcycles; trains, subways, and other rail vehicles; aircraft; and ships, barges, and other waterborne vehicles. Vehicles whose primary purpose is not transportation (e.g., construction cranes and bulldozers, farming vehicles, and warehouse tractors and forklifts) are classified in the sector of their primary use. Note: Various EIA programs differ in sectoral coverage.
* An energy-consuming sector that consists of all facilities and equipment used for producing, processing, or assembling goods. The industrial sector encompasses the following types of activity manufacturing (NAICS codes 31-33); agriculture, forestry, fishing and hunting (NAICS code 11); mining, including oil and gas extraction (NAICS code 21); and construction (NAICS code 23). Overall energy use in this sector is largely for process heat and cooling and powering machinery, with lesser amounts used for facility heating, air conditioning, and lighting. Fossil fuels are also used as raw material inputs to manufactured products. Note: This sector includes generators that produce electricity and/or useful thermal output primarily to support the above-mentioned industrial activities. Various EIA programs differ in sectoral coverage.