

📖 Topic Page: [Fuel](#)

Definition: **fuel** from *The Hutchinson Unabridged Encyclopedia with Atlas and Weather Guide*

Any source of heat or energy, embracing the entire range of materials that burn in air (combustibles). A fuel is a substance that gives out energy when it burns. A **nuclear fuel** is any material that produces energy by nuclear fission in a nuclear reactor. Fossil fuels are formed from the fossilized remains of plants and animals.

Crude oil (unrefined petroleum) is purified at an oil refinery by fractional distillation into fuels such as gasoline and kerosene. The burning of fossil fuels for energy production contributes to environmental problems such as acid rain and the greenhouse effect. Recognition of these problems has led to increased efforts to develop the production of biofuels from renewable resources and the use of electricity from renewable sources for transport.

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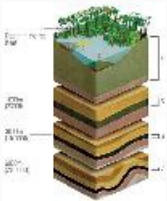


Image from: [The process of making coal begins with plant... in Philip's Encyclopedia](#)

Summary Article: **fuel**

From *The Columbia Encyclopedia*

material that can be burned or otherwise consumed to produce heat. The common fuels used in industry, transportation, and the home are burned in air. The carbon and hydrogen in fuel rapidly combine with oxygen in the air in an exothermal reaction—one that liberates heat. Most of the fuels used by industrialized nations are in the form of incompletely oxidized and decayed animal and vegetable materials, or fossil fuels, specifically coal, peat, lignite, petroleum, and natural gas. From these natural fuels other artificial ones can be derived. Coal gas, coke, water gas, and producer gas can be made using coal as the principal ingredient. Gasoline, kerosene, and fuel oil are made from petroleum. For most transportation, fuel must be in a liquid form.

There is a growing concern about the environmental contamination caused by the burning of great amounts of fossil fuels and about the increasing expense of finding them and processing them into easily usable forms (see energy, sources of). During the last 100 years the amount of carbon dioxide in the atmosphere has increased, and there is evidence that this phenomenon may be due to the burning of fossil fuel. Use of biomass, which consists of plants or plant waste, would not produce excess carbon dioxide because the plants absorb the gas for their growth. Wood is not as concentrated a form of energy as fossil fuels, but it can be converted into a more energy-rich fuel called charcoal. Burning fossil fuel also releases acidic oxides of sulfur and nitrogen, which are deposited on the earth in rainwater (see acid rain). The clearing of forests, particularly in the tropical regions, also threatens to increase the amount of carbon dioxide in the atmosphere because the forests utilize carbon dioxide

for growth.

The amount of fossil fuel available is limited and new methods of recovery are being developed. One proposed alternative fuel is hydrogen, which is now employed as a fuel only for a few special purposes because of its high cost. Hydrogen can be produced by electrolysis of water for which nonfossil fuels would supply the energy. Solar energy could be utilized either by direct conversion to electricity using photovoltaic cells or by trapping solar heat. Fuels are rated according to the amount of heat (in calories or Btu) they can produce. Nuclear fuels are also possible substitutes for fossil fuels. Nuclear fuels are not burned; they undergo reactions in which the nuclei of their atoms either split apart, i.e., undergo fission, or combine with other nuclei, i.e., undergo fusion. In either case, a small part of the nuclear mass is converted to heat energy. All nuclear fuels currently employed in practical, nonweapons applications react by fission.

High-energy fuels for jet engines and rockets are rated by their specific impulse in thrust per pound of propellant per second. Hydrogen, which is the lightest element, is usually used in the form of compounds, because the density of liquid hydrogen is low and therefore a large volume is required. Addition of aluminum powder or lithium increases the efficiency. Rockets usually have a self-contained supply of oxygen or some other oxidizer, such as ammonium, lithium, or potassium perchlorate. Fuels such as turpentine, alcohol, aniline, and ammonia use nitric acid, hydrogen peroxide, and liquid oxygen as oxidizers. More power can be obtained by oxidizing hydrazine, diborane, or hydrogen with oxygen, ozone, or fluorine.

See oil gas; liquefied petroleum gas; gas, fuel; nuclear energy.

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fuel. (2018). In P. Lagasse, & Columbia University, *The Columbia encyclopedia* (8th ed.). New York, NY: Columbia University Press. Retrieved from <https://search.credoreference.com/content/topic/fuel>



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