

Glossary alternative fuels

Alcohol – general term, applied to any organic compound in which a hydroxyl group (-OH) is bound to a carbon atom, which in turn is bound to other hydrogen and/or carbon atoms. See also Ethanol and Methanol.

Alternative Fuel – referring to all fuels except for diesel and gasoline

B5 – A 5% content of biodiesel blended with Diesel. B5 is known not to require any engine modifications. Higher blend ratios are named accordingly: B20, B30, etc.

BTL (Biomass to Liquid) – liquid fuels derived from biomass. Could be DME, Methanol, Synthetic Diesel, Ethanol etc.

Biodiesel – renewable, biodegradable fuel made from various vegetable oils, animal fats and recycled restaurant greases. It is made through a chemical process called transesterification in which glycerin is separated from the fat and vegetable oil. Soy-based biodiesel is the most commonly used form. Biodiesel is either sold as a blend with conventional diesel or pure.

Biofuels –renewable fuels generally derived from agricultural crops or biomass resources such as agricultural, wood, animal, and municipal wastes and residues. Biofuels can refer to fuels for combustion for heat and electricity production, but are generally fuels utilized for transportation. These include alcohols, esters, ethers and other chemicals made from biomass.

BioGas – Biogas can be produced from all kind of biomass. The biomass is anaerobically fermented into gas. The raw biogas is cleaned and the final product consists of methane. Biomass – any organic matter that is available on a renewable or recurring basis (excluding old-growth timber). Biomass includes dedicated energy crops and trees, agricultural food and feed crop residues, wood and wood wastes and residues, aquatic plants, grasses, residues, fibers, and animal wastes, municipal wastes, and other waste materials.

CTL (Coal-to-Liquid) – liquid fuels produced from gasification of coal including DME, Methanol or Synthetic diesel.

Carbon dioxide (CO₂) – a normal, non-toxic product of burning fuel. When petroleum fuel burns, the fossil carbon is combusted and the levels of atmospheric carbon dioxide increases thus resulting in global warming. By contrast, burning biofuels does not increase atmospheric carbon dioxide levels because of the natural carbon cycle – the carbon dioxide formed during combustion is taken back from the atmosphere during the annual growth of plants used to produce biofuels.

Carbon monoxide (CO) – a poisonous gas produced by incomplete combustion. Since more than two-thirds of this pollutant is caused by transportation, many U.S. cities have mandated the use of "oxygenated" gasoline, such as ethanol blends, to reduce carbon monoxide emissions.

Crude Oil – Petroleum as found in the earth, before it is refined into oil products. Also sometimes called Crude.

DME (Dimethyl ether) - is a clean-burning non-toxic gas which can be made from natural gas, coal, or biomass. DME is a liquid at 5 bar pressure at room temperature. DME can be produced via a gasification process.

E10 – a blended fuel containing 10 percent ethanol and 90 percent gasoline.

E85 – a blended fuel containing 85 percent ethanol and 15 percent gasoline.

Ethanol – renewable, biodegradable fuel produced by fermenting crops that contain starch or sugars. Currently, corn and sugarcane are the most predominant crops in producing ethanol. Wastes from paper mills, potato processing plants, breweries and beverage manufacturers may also be used for producing ethanol. Ethanol is an alcohol.

FAEE (Fatty acid ethyl ester) - can be created by an alkali catalyzed reaction between fats or fatty acids and ethanol. FAEE has similar properties as FAME.

FAME (Fatty acid methyl ester) - can be created by an alkali catalyzed reaction between fats or fatty acids and methanol. The molecules in biodiesel are primarily FAMEs.

Fischer-Tropsch – a process used to produce synthetic hydrocarbons. The process is used for production of synthetic diesel sometimes called Fischer-Tropsch diesel.

Fossil fuels – carbon, crude oil and natural gas that has been formed from dead plants and animals under high pressure for hundreds of millions of years. Is not included in the concept of alternative fuels.

Fuel Cell – A device or an electrochemical engine that converts the chemical energy of a fuel, such as hydrogen, and an oxidant, such as oxygen, directly into electricity.

GTL (Gas-to- Liquid) – liquid fuels produced via synthetization of natural gas.

Hydrogen – Hydrogen is naturally occurring chemically bound to other substances, Hydrogen can be produced from electrolysis of water, gasification of biomass, coal or natural gas. Hydrogen can either be pressurized or kept at -253°C as a liquid.

LPG (Liquid Petroleum Gas) – A mixture of gaseous hydrocarbons, mainly propane and butane, that change into liquid form under moderate pressure. It is normally created as a by-product of petroleum refining and from natural gas production.

Methane – the simplest of hydrocarbons that is the main component of natural gas and biogas. It is the product of anaerobic decomposition of organic matter, enteric fermentation in animals and is a strong greenhouse gas.

Methanol – the simplest alcohol, a light, volatile, colorless, flammable, poisonous liquid. Methanol can be produced via a gasification process.

Natural Gas (NG) – Hydrocarbon gas found in the earth, composed of methane, ethane, butane, propane and other gases. LNG and CNG are abbreviations for liquefied natural gas and compressed natural gas.

Non-Conventional Oil – is extracted using techniques other than the traditional. Currently the production is less efficient and has larger environmental impact relative to conventional oil production. Non-conventional types of production include: tar sands, oil shale, bitumen, biofuels, thermal depolymerization (TDP) of organic matter, and conversion of coal or natural gas to liquid hydrocarbons.

RME (Rapeseed Methyl Ester) – is a member of the FAME group.

SME (Sunflower Methyl Ester) – is a member of the FAME group.

Synthetic Diesel – Diesel produced via the Fischer-Tropsch process using biomass, natural gas or coal. Synthetic diesel is a paraffin product without sulphur.

Table 3.1 Matrix of possible fuel/propulsion system combinations

	Spark Ignition	Compression Ignition	Fuel Cell	Reformer + Fuel Cell	Electric Motor
Gasoline	●			●	
Diesel		●		●	
CNG	●			●	
LPG	●				
Hydrogen	●		●		
Methanol	●	●	●	●	
Ethanol	●	●		●	
Biodiesel		●			
DME		●		●	
Electricity					●
F - T Diesel		●		●	

Source: Frost & Sullivan 2002, Figure 2.2