

Biodiesel

Biodiesel (chemically known as fatty acid methyl ester) is an alternative fuel to conventional diesel (obtained from crude petroleum).

When vegetable oil or animal fat is chemically reacted with an alcohol (methanol) and catalyst (caustic soda or caustic potash or sodium methoxide), biodiesel is produced along with glycerine as by product. This process is called transesterification.

Biodiesel fuel has chemical properties that are similar to conventional diesel fuel and does not require any engine modifications or new equipment to enable its use as a blend stock or substitute for conventional diesel. Unlike conventional diesel fuel, biodiesel is renewable fuel and significantly reduces levels of harmful pollutants and global warming gases.

The feedstock (vegetable oil and fats) include the following

- Vegetable oils produced from oil seeds (like rape seeds / canola, soybean, sunflower, palm, jatropha, corn, cotton seed, etc)
- Oil obtained from algae
- Used cooking oil and grease (yellow, brown, etc)
- Animal fat (beef tallow, poultry fat, pork fat, etc)
- Fatty acids including palm fatty acid distillate
- Wastes (e.g. waste oils, food processing wastes, etc), agricultural residues (straw, corn stover, etc), forestry residues and novel feed stocks, such as algae.

Current R&D on biofuels is mainly focused on:

- Developing cost-competitive advanced technologies to convert wastes into fuels;
- Producing fuels with advanced properties that are compatible with existing engines and infrastructures (for air, long-distance freight, and shipping).

However, biofuels production cannot be viewed in isolation. Biofuels are part of a growing global bio industry, driven by the need to reduce reliance on fossil fuels, to decelerate climate change, increase fuel security and develop a greater range of bio products. With a growing global population, mean there is increasing local and global competition for land, feedstocks and water for food production (i.e. crops and livestock), non-food use (e.g. timber for construction), bioproducts (e.g. soaps, textiles, biopolymers, etc), and bio energy (heat and power), as well as liquid biofuels.

Selected producers of biodiesel in India

- Universal Biofuels Pvt. Ltd
- Southern Online Bio tech Ltd
- Bannari Amman Sugars
- My Ecoenergy
- Emami Biotech Ltd

To maximise the value of biomass resources, cascading production of bioproducts, liquid fuels and may be integrated in bio refineries.

At the same time, biodiversity (species of plants and animals) need to be conserved, and forested areas must be protected as they act as important habitats and carbon sinks. In other words, the forests store large amounts of carbon in vegetation and soil. If areas are cleared for logging, grazing, crop production or construction, the carbon is released into the atmosphere and habitat is lost.

In order to ensure that communities, biodiversity and land are protected, a number of certification schemes and sustainability initiatives have been put in place for biofuels. These include initiatives by trade organisations, civil societies (NGOs), and government bodies. Further details are provided on the pages covering sustainability and certification of biofuels.

In the coming decades, biofuels will be required for road, air, rail and shipping. An integrated biofuels strategy is required for meeting the competing needs of these different transport types at national and international level.

For more details:

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