

# Biodiesel: Alternate Fuel for the Future Generations

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**ABSTRACT:** *This paper offers a detailed idea of the potential technologies for generating renewable energy in the form of biodiesel. The rapid population growth requires energy that should be renewable in all respects and biodiesel will fulfil this. In recent years, due to the growing usage of petroleum fuels in the automotive and manufacturing industries, the world has begun to face serious problems such as environmental degradation, loss of the ozone layer, and global warming. Biodiesel is pulling the globe to its side as the alternative energy source due to strong oxidation properties and lubricating design. Therefore, in attempt to change the previous one, many researchers from various regions of the globe are conducting research to find an alternative source. Biodiesel will replace the current energy shortage and help mitigate global warming even further. The use of biofuels results in a decrease in global warming and also helps to sustain fossil fuel demand and supply levels. In addition to comparing the features of various fuels and their benefits and drawbacks, this paper provides an insight on the different fuel types accessible.*

**Keywords:** *Advantages, Alternative, Bio-Energy, Bio-Diesel, Disadvantages, Renewable Resources.*

## INTRODUCTION

Energy has the potential to do function and is becoming a central element in the occurrence of a system. Anything that can produce heat, strength, life, move objects, or generate power is a fuel source. It is considered a fuel that retains energy. Along with the population, human energy intake has gradually increased and eventually reached a stage of extinction [1]. Human beings consumes quite enough as 110 times the energy obtained by early human beings in today's society, i.e. the evolving country requires energy to operate it. Most of the energy we use today comes from fossil fuels, but the downside of fossil fuels is that they are restricted in nature and trigger other possibly adverse environmental effects[1].

### *Renewable Resources*

Renewable resources are those resources that can be refilled through short periods of time by the climate. It's far more beneficial to use this type of resource so nature will substitute for it. Solar energy, wind energy, hydropower, geothermal, and biomass energy are a few examples of renewable sources. Non-Renewable Sources Unlike renewable energy sources, non-renewable resources are resources which are not readily replenishable by the environment. Non-renewable resources are regarded as ground materials and metal minerals, fossil fuels (coal, petroleum, and natural gas) and groundwater under circumstances.

## *FUELS*

We see many things running around us in our daily life experience, some sort of energy that is supplied by the aid of fuel is needed to operate them. A fuel would be any substance which can be produced to react with other substances in order to transfer chemical or nuclear power that can be specifically used or transformed into work. During the industrial revolution, fossil fuels were adapted quickly because they were inexpensive and effective. They have become an integral part of our culture, but they have also been highly polluting. Citizens are actually more likely to use green fuels, like biofuels.

Biofuels are biomass-derived fuels that can be solid, fluid and gases. It is possible to use biomass combined heat and power or energy or to utilize it to get the full value from it. From any activated carbon, biofuel can be made. For biofuel processing, several specific plant derived materials are used. Ethanol, since it is made of corn, is also a biofuel. Biodiesel is a fuel manufactured from vegetable oil for automobiles[2].

## **ENERGY FROM OTHER SOURCES**

The sum of energy from various types of fuel relies on the stoichiometric ratio, the AFR ratio, the power per unit mass, and its particular energy. The Air-Fuel Ratio (AFR) is the air-to-fuel mass ratio that occurs in a complete combustion including an internal combustion engine or industrial furnace.

### *Nonconventional energy resource*

Non-conventional energy is defined as energy produced by the use of wind, tides, solar, geothermal heat, and biomass, including agricultural and animal waste and human excreta. These all resources are either organic or environmentally friendly and could be refilled and will not pollute the environment. In addition, large spending is not required[3].

### *Bio-Energy:*

As an energy source, biomass is considered. The energy that biomass provides us is bio-energy. Inferior wood and urban waste are some essential sources of biomass. In fiber, poultry and human excrement, biomass refers to both plant matter and animal byproducts. It involves both terrestrial and aquatic matter, like fresh development of crops, drainage and sewage.

### *BIO-DIESEL*

Bio-diesel relates to a diesel fuel dependent on animal fats and vegetable oils containing long-chain alkyl (methyl, ethyl, or propyl) esters. Biodiesel is formed by vegetable oil, soybean oil or animal fat chemically interacting with alcohol generated from various fatty acids. In conventional diesel engines, bio-diesel is being used and is thus different from the vegetable and waste oils used during diesel engines that are transformed to fuel. Bio-diesel could be used alone or, in some quantities, combined with petro diesel. Monoalkyl ester with long-chain fatty acids is also related to as biodiesel. With only slight modifications, ratios of 20 percent biodiesel and lower can be used in diesel equipment.

### **BIODIESEL PRODUCTION VIA OILSEED CROP**

A wide range of oilseed crops and livestock fat can be used to make biodiesel. In Europe, the main biodiesel feedstock is rapeseed oil. In the U. S., soya beans are a main raw material for biodiesel. Algae comprises 90% of the biodiesel that is found in it[4].

Oil seed considered for the production of biodiesel are:

- Soybean
- Mustards
- Rapeseeds and Canolas
- Camelinas
- Sunflowers
- Karanjas
- Mahuas
- Neem oils
- Rice bran oils
- Jatrophas

Biodiesel can also be produced from the other different sources like:

- Used and waste oil: While the cost of producing this urban product is greater per gallon than that of the cost of implementing pure vegetable oils,
- Animal Fats: Biodiesel feed-stocks are low-cost fatty oils of animals. Nevertheless, animal fat feeding supplies still have some disadvantages and obstacles.
- Algae: Due to various their comparatively high oil content and rapid biomass processing, microalgae has historically been thought as possibly interesting resources for biofuels.

### **SELECTION OF FEEDSTOCK FOR BIODIESEL**

In particular, despite all the results and limitations, seed and nut must be picked, preserved in cool and dry environments, and handled early to stop deterioration. The seed must be handled near the time where biodiesel is produced with the oil. The seed should be washed, inspected and, in some scenarios, battered or de-hulled before processing. In certain situations, the meal or cake should be warmed to disable hazardous substances prior to use. Biodiesel isn't just about animal protein or pure vegetable oil. By using pure vegetable oil or pure animal protein fuel, a normal diesel engine would gradually be impaired. Vegetable oils or animal proteins should be processed to biodiesel through alcohol and catalyst reacting to the oil or fat. This step is known as "transesterification"[5].

### **ADVANTAGES OF BIODIESEL FUEL**

1. Simple for using: No alteration of the automobile or the required fuel machinery.
2. Energy, efficiency as well as economy: Established power generation, cost and efficiency have enabled biodiesel a valuable fuel.

3. Impact on the planet: Biodiesel leads to pollution reduction and enhances wellbeing by minimizing CO<sub>2</sub> emissions, thus minimizing the effects of global warming.
4. Use of imported oils is limited by biodiesel.
5. Biodiesel is better to manage as it's less hazardous than gasoline and easily stored.
6. By keeping energy resources at home, biodiesel supports populations[6].

#### DISADVANTAGES OF BIODIESEL FUEL

1. It needs energy for the production of biodiesel fuel from soybean crops, plus sowing, fertilising and collecting energy.
2. Biodiesel fuel is reportedly around one and a half times more expensive than petrodiesel.
3. A further drawback of biodiesel fuel is that in certain machines it can damage rubber houses.
4. The dirt can be gathered in the fuel filter as Biodiesel cleans the dirt from the engine and blocking up develops. So, filters must be adjusted periodically.
5. Infrastructure for the distribution of biodiesel fuel requires development, which is another biodiesel fuel drawback[7].

#### CONCLUSION

As it preserves the climate, biodiesel offers energy protection and also boosts the economy. Today, not just in America, but also in other places around the world, biodiesel is developing into an increasing alternative fuel. Energy safety is one of the key factors behind the conversion to biodiesel fuels. If the nation's reliance on foreign oil is decreased, it would increase the use of locally available sources. So, without even a reduction in greenhouse gas emissions, a nation seeks energy protection in biodiesel fuel. Although the overall energy balance is still a debatable problem, the energy security of biodiesel fuel is improved tremendously. It has been reported that carefully regulated biodiesel fuels have the ability to improve resource protection and can also contribute to the production of different energies.

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