

## **BIOFUELS**

***“Biofuel is an inexhaustible, biodegradable fuel manufactured from Biomass.”***

Biofuel is considered pure and the easiest available fuels on planet earth. Biofuels are obtained from biomass like wood and straw, which are released by direct combustion of dry matter and convert into a gaseous and liquid fuel. Other sources include organic matter like sludge, sewage and vegetable oils matter, which can be converted into biofuels by a wet process like digestion and fermentation.

### **Types Of Biofuels**

Biofuel is generally available in all regions of the world, which mainly include fuels like:

- Biodiesel
- Bioethanol
- Bio methanol

The two most common types of biofuels in use today are bioethanol and **biodiesel**. Both of which represent the first generation of biofuel technology.

### **Production Of Biofuel From The Plant Products**

Wood, straw and domestic refuse are used as a source of heat and energy. Biofuels can also be produced from animal fats, plant wastes and other organic wastes produced from living organisms.

This process is divided into three categories:

- **First-generation:** Biofuels are primarily produced from edible sugar, starch and other food crops are grown on arable land.
- **Second generation:** Biofuels are produced from non-edible plant materials, such as plant dry matter or woody biomass, or agricultural residues and wastes.
- **Third generation:** Biofuels are primarily produced from algae and microbes. Algal fuels have high yields.

The jatropha – a genus of flowering plants in the spurge family. This is a source of biofuel and is widely cultivated in many regions of the world. According to the records collected in the year 2009, Pakistan is the top country in developing biofuel energy resources globally.

### **PROCESS OF BIOFUELS**

#### **Step-1**

The crops of selected plants are let out freely to absorb the heat from the sun.

#### **Step-2**

Later these crops are refined in factories to produce food products.

#### **Step-3**

Once the food products are produced, these crops are refined to produce biofuel.

#### **Step-4**

After the production of biofuels, they are collected in tanks and used for a different process.

Biomass or feedstock used for the production of biofuels are:

- Grain starch to produce bioethanol: Corn and wheat.
- Sugar crops to produce bioethanol: Sugarcane and sugar beets.
- The crops of oilseed used to produce biodiesel: Soybeans, rapeseeds, palm oil, cooking oil and other tropical oilseeds.

Cellulosic **biomass** to produce bioethanol are:

- Forest wastes.
- Municipal solid waste.
- Managed biomass such as trees and grass.
- Crop residues, such as corn stover, wheat straw, rice straw, sugarcane bagasse.

#### Advantages Of Biofuel:

1. Promotes a healthier population.
2. It helps in maintaining a cleaner environment.
3. There is no emission of hazardous gases, such as Carbon monoxide (CO) and sulphur oxide (SO).
4. Using biofuels rather than fossil fuels, there is the only emission of non-toxic materials, which reduces the risk of cancer and breathing problems in human beings.
5. Biofuels are friendly to the environment because they reduce the risk of global warming.

#### Disadvantages Of Biofuel:

1. It disturbs the life cycle.
2. Cost of labour and it requires huge space for storage.
3. More water consumption, especially in dry climates.
4. Growing biomass for biofuel production increases the demand for agricultural land.