

Advantages of Biofuel

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ABSTRACT

Biofuel is a fuel that contains energy from geologically recent carbon fixation. These fuels are produced from living organisms. These fuels are made by a biomass conversion. The key raw materials for bioethanol production are sugarcane, corn and for the biodiesel are vegetable oils from rapeseed, mustard, soybean, sunflower and palm oil. Examples of this carbon fixation occur in plants and microalgae.

*The Government is currently implementing an ethanol-blending program and considering initiatives in the form of mandates for biodiesel. Due to these strategies, the rising population, and the growing energy demand from the transport sector, biofuels can be assured of a significant market in India. Biofuel development in India centers mainly around the cultivation and processing of *Jatropha* plant seeds which are very rich in oil (40%).*

*The State Bank of India provided a boost to the cultivation of *Jatropha* by signing a Memorandum of Understanding with D1 Mohan, a joint venture of D1 Oils plc, to give loans to the tune of 1.3 billion rupees to local farmers in India. Farmers will also be able to pay back the loan with the money that D1 Mohan pays for the *Jatropha* seeds.*

Sweet sorghum stalk has been found to be a potential source of raw material for commercial ethanol production. Sweet sorghum does not compromise on food, feed or fodder production when used for energy production, thereby meeting the biofuel program's vision of not compromising on food security.

Keywords: *Biofuel, Biomass, *Jatropha*, Power Alcohol Act 1948, Biodiesel.*

1. INTRODUCTION

Biofuels are those fuels which are produced from living organism. These fuels are made from biomass conversion and contain energy from geologically recent carbon fixation. This carbon fixation is generally occurred in plants and microalgae. For the production of biofuels raw materials used are sugarcane, corn and for the biodiesel are vegetable oils from rapeseed, mustard, soya bean, sunflower and palm oil.

Energy is a critical input for economic growth and sustainable development in both developed and developing countries. Transportation requires a large number of energy which is fulfilled from non-renewable fossil fuels. Since last decade price of crude oil has increased from US\$ 20 to US\$100, and is expected to continue to rise as the supplies are shrinking and demand is on an exponentially rising curve.

In India, the energy demand is mostly met through non-renewable sources such as coal, natural gas and oil and continues dominantly for next few decades which is prominently used by industries followed by transportation.

Nowadays Biofuel is introduced as the alternative energy options to meet transportation sector demand in developing countries. Government of India (GOI) has taken few steps for promoting biofuels as alternative energy source. The GOI has stipulated mandatory blending requirements of gasoline with biofuels and facilitated optimal development and utilization of indigenous biomass feed stocks for biofuel production.

Bio-ethanol feed stock is classified into three major groups:-

1. Sucrose containing feed stocks (sugarcane, sugar beet, sweet sorghum and fruits).
2. Starchy materials (corn, wheat, rice, potatoes, cassava, barley, sweet potatoes).
3. Lignocellulose biomass (wood, straw, and grasses).

Biofuel can be classified depend upon their uses and raw materials as:-

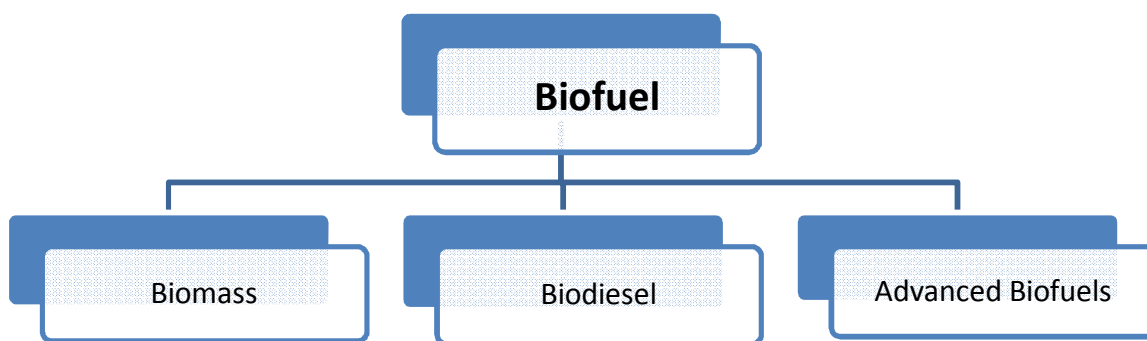


Figure 1. Biofuel classification

Biomass

Biomass refers to materials especially plant's waste like soya husk, coconut shell, coffee waste by which power is generated.

Biodiesel

Biodiesel is a vegetable oil or animal fat based diesel fuel consisting of long chain alkyl esters. It is mainly obtained from *Jatropha* oil.

Advanced biofuels

Advanced biofuels are extracted from wood biomass, agricultural and forest waste, municipal solid waste conversion, microalgae and photosynthetic organism.

2. INDIA'S BIOFUEL POLICY

In 1948, the Power Alcohol Act emphasized on blending petrol with ethanol. The main objective of this act was to keep a check on the wastage of molasses and reduce dependence on petrol imports by blending petrol with ethanol from molasses. At the same time, it also helped in keeping a check on sugar prices.

In January 2003 the Government of India started the Ethanol Blended Petrol Programme (EBPP) in nine States and four Union Territories for the promotion of the use of ethanol for blending with gasoline and the use of biodiesel derived from non-edible oils for blending with diesel. This blending is restricted up to 5% by volume.

In April 2003, the Government identified *Jatropha curcas*, in their National Mission on Biodiesel as the most suitable tree-borne oilseed for biodiesel production.

Salient Features of Policy:-

1. A projected target of 20% blending of biofuels both for bioethanol and biodiesel by the year 2017.
2. The production of the Biodiesel from non-edible oilseeds on waste, degraded and marginal lands is to be encouraged.
3. A term Minimum Support Price (MSP) is used to provide sufficient amount of money to farmers producing non-edible oilseeds used to produce biodiesel.
4. Financial incentives and subsidies for new and second generation biofuels which includes a National Biofuel Fund.
5. The Government announced Biodiesel and bioethanol as "declared goods" to ensure an unrestricted Inter-State & Intra-State movement of biofuels.

6. A Biofuel Steering Committee was established under the Cabinet Secretary to oversee policy implementation.
7. For a broader policy perspective a National Biofuel Coordination Committee was established under the Prime Minister.

Table 1.Implementation of policy

State	Description
Andhra Pradesh	Andhra Pradesh has a formal agreement with Reliance Industries for Jatropha planting. 200 acres land to grow Jatropha for high quality biodiesel.
Karnataka	In Mysore Lab land Biodiesel Pvt. Ltd. Company is active in Biodiesel and Jatropha curcas-based Research and Development activities.
Maharashtra	In September 2007, the Hindustan Petroleum Corporation Limited (HPCL) and the Maharashtra State Farming Corporation Ltd (MSFCL) jointly organize a venture for a Jatropha seed-based bio-diesel production.
Tamilnadu	In the past few years Tamil Nadu is aggressively promoting the plantation of Jatropha to help farmers overcome the losses due to irregular precipitation. Currently they cultivated the plant in 3 km ² as against the goal of 50 km ² .
Rajasthan	Rajasthan is a suitable place for the cultivation of the Jatropha as it requires a little amount of water. Jatropa plantations have been undertaken in Udaipur, Kota, Chittor, and Churu districts. Udaipur is the major supplier of the jatropha seeds especially for germination.
Eastern India	Many NGO's promote JATROPHA plantation on the waste land possessed by farmers in north eastern states, Orissa and Jharkhand.
Indian Railway	The Indian Railway has started to use the biodiesel (blended with diesel fuel in various proportions) from the Jatropha plant to power its diesel engines.

3. CHHATTISGARH ON THE PATH OF BIOFUEL DEVELOPMENT

Chhattisgarh government has decided to plant 160 million saplings of Jatropha in all its 16 districts during 2006 with the goal of becoming a bio-fuel self-reliant state by 2015. They plan to earn INR 40 billion annually by selling seeds after 2010. The central government has also provided INR 135 million to Chhattisgarh in **2013** for developing Jatropha nursery facilities. Government plans to replace all state owned vehicles using diesel and petrol with Jatropha fuel by 2007.

4. PRESENT STATUS OF DEVELOPMENT OF BIOFUEL IN INDIA

Development of biodiesel in India and other developing countries is an unidirectional approach in terms of program conception and design. This scalar approach is similar to the concept of “tree”, where producers are at one end (in the rural area) and users on the other end (by urban transport). This design shows that producers are the ones who do not need the output of the production and it should go to the users irrespective of concern of resources and producers.

According to National Policy of Biofuels, the State Governments have to set up nodal agencies for the promotion and development of biofuels in their states. The already existing governing bodies like Panchayati Raj Institutions and Forest Dept. are given the task of monitoring biofuel development in some states.

For awareness and capacity building of human resources educational institutions in some states have been assign the task of biofuel promotion.

It is not possible to produce and use the biodiesel in its pure form technically as well as economically and it has to blend with petroleum diesel.

5. CONCLUSION

Biodiesel is a good replacement of the petroleum fuel. Even in blended form it would significantly reduce CO₂ emissions. Biodiesel is ecofriendly and non-hazardous to living beings so promotes healthy life and environment. And above all Biodiesel will help reduce dependency on the petroleum industry which in turn will strengthen the economy on both the national as well as regional level. Optimal use of biodiesel on industrial and domestic level will certainly help us restore the ecological balance.

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