

**Biofuel: Is it a Superlative Power over Chemical or Something Else?****Bitu Gartia\***

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**Review Article**

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University, Bhubaneswar, India,**E-mail:** gartiabitu4@gmail.com**Keywords:** Biofuel, Algal biofuel, Biodiesel, Chemicals, High energy**ABSTRACT**

Biofuel is now a leading hotspot and an innovative topic in the mind of researcher and professor in order to make a best alternative resource for fuel and efficient energy. It has predominantly risen into marvellous option in the area of energy and fuel application. Some of them are confirming it as an alternative to chemicals. From the energy efficiency to energy consumption, biofuel is a hot topic no doubt. Moreover this may turn into biggest research area for the upcoming days to the nation which are already developed or developing one.

**HISTORY**

Biofuels and Chemicals are two different competitors towards the world's energy which can be either in the form of fossil fuel, Algal biofuel and Microbial fuel <sup>[1]</sup>. Moreover there are certain limits and other potential differences between Biofuel and Chemical e.g. the application of Alcohols, an organic compound and their other compounds as Biofuel and Gasoline Blends <sup>[2]</sup>. In recent scenario, most of the biofuel source comes from Algae, Marine Algae, Plant seeds and Microbial world <sup>[3-6]</sup>. The most dynamics research and study make a conclusion report as biofuel is nothing but the major contribution of Algae to make the reducible approach to global warming <sup>[7,8]</sup>. No doubt Biofuel are the most prominent topic in the world which can replace the essential application of chemicals and its derived energy.

**Biofuel**

Biofuel term is common to all as we are living in a world of technology and innovation that generally refers to liquid transportation fuel like biodiesel and bioethanol and a complete bio resource to reduce the global greenhouse gas emissions <sup>[9]</sup>. Continuously biofuel evolution is rising that may be in the form of first and second generation consisting of Food-Based Biofuels and Cellulosic Biofuels <sup>[10]</sup>. Biofuel from biomass resources include those derivative from forestry or crop department of agriculture and in addition to the point, derivative to other sources from wood related industries, waste sources from commercial industries where the wastes comprises of fibre and demolition.

**The Demand of Biofuel towards the Energy Supply**

The Fuels extracted from the crude oil fulfil the demand of people worldwide with a percentage of 96% for transportation and some other form of energy like natural gas, coal, solar energy, the organic alcohols and electrical power contribute significant amount of energy to the specific transportation use and application <sup>[11]</sup>. Unfortunately the demand of this energy from crude oil is limited as the resources are not sufficient which results increase in crude oil price and the uncertainty of economic index <sup>[12,13]</sup>. So alternative option for the crude oil and research has been started that confirms the rise of Biofuel, necessary for the mankind for environmental reasons, renewable form of energy and other form of interest <sup>[14]</sup>.

**The Scenario of Biofuels Production Globally**

The production of biofuel is increasing rapidly in some developed country and developing country and researcher are more enthusiastic for the production to raise the economy of the nation. Currently Brazil is the top contributor to biofuel production using

sugar cane and most of the cars are utilizing that source as energy fuel <sup>[15]</sup>. Some of the countries like China, India, and Malaysia etc. are focusing more on biofuels and related modern research activities & practices have been started in those countries <sup>[16-19]</sup>.

## Biomass and Availability of Resources

The two pathways presently used in for large scale are firstly the production of Ethanol from carbohydrate rich crops or starch e.g. grain crops and secondly bio-diesel from oil linked seed crops (sunflower, rapeseed, soy bean and other raw substances) converted into methyl esters (Fatty Acid Methyl Ester or FAME) <sup>[20-22]</sup>. Today, methanol, from fossil fuel, is widely used for the process of esterification. A statistical option or approach in the future or upcoming days, would be to use this biomethanol in the FAME production, or the production of Fatty Acid Ethyl Ester (FAEE) bio-ethanol instead of methanol <sup>[23]</sup>. Ethanol can be incorporated in the gasoline pool, either by direct blending or by transformation, and both without engine modifications <sup>[21,24,25]</sup>. Some ethanol is also used as an 85% blend in flexible fuel cars, mixed with diesel using a stabilising additive (e-diesel) on test fleet level, and as fuel for diesel buses (with ignition improver) <sup>[25-27]</sup>. The most frequent use of ethanol in different countries at present is through conversion into ethyl tertiary butyl ether (ETBE) by etherification of ethanol and iso-butene, the latter being a by-product of refinery processes <sup>[28,29]</sup>.

ETBE, however, may have (like other ether-oxygenates) some disadvantages, such as potential ground water contamination. Its use is currently limited by the availability of isobutene. Pressed vegetable oil as such has been tested in vehicle fleets with mixed results <sup>[30,31]</sup>. Conversion of oil of biological origin (plants/animals) by esterification with methanol results in a fuel widely accepted by diesel engine manufacturers. It is used both in pure form (in trucks) and admixed to diesel from mineral oil. Esterification of oils from biological origin with bioethanol will be discussed further in order to generate biodiesel independent from fossil fuels <sup>[32,33]</sup>. The production of biogas is a third available pathway <sup>[34]</sup>. It can be either produced in dedicated facilities from organic wastes or recovered from municipal solid waste landfills <sup>[35,36]</sup>. The recovery of biogas is important not only as a resource, but also for avoiding the discharge of a greenhouse gas in the atmosphere <sup>[37]</sup>. Upgraded biogas compressed at a certain pressure can be used as an engine fuel, but presently represents a niche market <sup>[38]</sup>.

## Technical and Non-Technical Aspects of Biofuel

### Regulation, legislation, sustainability and standards

Biofuels creation is manageable. This requires choices for productive and manageable yields and includes the advancement of both the essential and leftover types of rural and ranger service operations <sup>[39]</sup>. Whilst biomass generation and vitality misuse is positive as far as worldwide GHG outflows, consideration ought to be taken when arranging at nearby level. The creation of vitality products ought to conform to the current controls, e.g. "crosscompliance" with agribusiness <sup>[40]</sup>. Land systems need to present various yields and ranger service administration plans chose by attributes and needs. Accordingly, the whole esteem fasten should be assessed for biofuels utilizing a "well-to-wheels" examination. This requires improvement of the topographical area of creation offices and the source of feedstock. Creation and feedstock supplies should be evaluated all around, assessing distinctive developing conditions (atmosphere) and work costs <sup>[41,42]</sup>.

### Liquid/ fluid biofuel over chemicals

Fluid biofuels are progressively utilized far and wide, either as an immediate "drop-in" trade for fuel, or as an added substance that lessens carbon discharges <sup>[43,44]</sup>. The energizes and chemicals are frequently delivered utilizing microorganisms to change over sugars from corn, sugar stick, or cellulosic plant mass into items, for example, ethanol and different chemicals, by aging. In any case, this procedure can be costly, and engineers have attempted to cost-viably increase creation of cutting edge biofuels to substantial scale fabricating levels. One specific issue confronting makers is the tainting of maturation vessels with other, undesirable organisms. These intruders can outcompete the maker organisms for supplements, diminishing yield and profitability. Ethanol is known not poisonous to most microorganisms other than the yeast used to deliver it, *Saccharomyces cerevisiae*, normally averting tainting of the aging procedure <sup>[45,46]</sup>. Nonetheless, this is not the situation for the more progressed biofuels and biochemicals a work in progress. To execute off attacking organisms, organizations must rather utilize either steam sanitization, which requires maturation vessels to be worked from costly stainless steels, or excessive anti-toxins <sup>[47]</sup>. Uncovering substantial quantities of microorganisms to these medications energizes the presence of tolerant bacterial strains, which can add to the developing worldwide issue of anti-infection resistance <sup>[48]</sup>.

## CONCLUSION

The communication channels to key actors need to be strengthened. In particular, the awareness should be enhanced of Municipal Solid Waste companies (for the energy potential of their wastes, along with policy measures to promote waste to energy) and farmers (for energy crops and for the energy value of current food crops and respective residues/by- products).

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