

## Biorefinery

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### ABSTRACT

There are infinite options for renewable energy resources which can be replacement for the non renewable energy resources which are danger for the environment. Improvement of their utilization and minimization of non-renewable resources is the main objective to built green earth. Biomass is playing a major role in the replacement of the resources which are causing drastic pollution. They show effective benefits by producing Biofuel. This can be achieved by establishment of Biorefinery. Permaculture and Ecological sanitation process are enhancers for biomass. Thus, upholding biomass as renewable energy resource can give a hope for revitalization.

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### 1. Introduction

Energy is a Quantitative property that must be transferred to an object in order to perform work, Energy is conserved quantity and energy can be converted from one form to another but can't be created or destroyed. Resource is a supply from which a benefit is produced. Resources are of two types, Non renewable resources Renewable resources. Non renewable resources are not eco friendly and they contaminate the environment with its forceful effects. The energy from these sources is non renewable energy. Non-renewable energy comes from sources that will run out or will not be replenished in our lifetimes. Types of Non renewable resources are Energy from Fossil fuels, Natural gas, Petroleum, Electric power plants

Renewable resources are derived from the environment. It refers to the provision of energy which is naturally replenished. The energy from these sources is renewable energy. Renewable energy is energy that is collected from renewable resources, which are naturally reloaded on a human timescale, such as sunlight, wind, tides, geothermal heat. Types of renewable energy are Solar energy Wind energy, Hydroelectric energy, Biomass, Petroleum, Tidal energy, Geothermal energy

### 2. Biomass

Biomass is an industry term for getting energy (bioenergy) by burning organic matter from plants and other natural resources. This a biological energy source or bioenergy from living or dead organisms which can involve in power production, alternative for fossil fuels, electricity and heat production. Biomass has been classed as a renewable energy source because plant stocks can be replaced with new growth. It has become popular among coal power stations, which switch from coal to biomass in order to convert into renewable energy generation without wasting existing generating plant and infrastructure. Biomass most often refers to plants or plant-based materials that are not used for food or feed, and are specifically called lignocelluloses biomass can be used directly via combustion to produce heat. Biomass also includes plant or animal matter that can be converted into fibers or other industrial chemicals.

Industrial biomass can be grown from numerous types of plants including miscanthus, switchgrass, hemp, corn, poplar, willow, sorghum, sugarcane, bamboo and a variety of tree species, eucalyptus also. As biomass is a natural material, many highly efficient biochemical processes have developed in nature to break down the molecules of which biomass is composed, and many of these biochemical conversion processes can be harnessed. The biochemical conversion involves, Use of the enzymes of bacteria and other microorganisms to break down biomass into gaseous or liquid fuels, such a biogas or bioethanol. In most cases, microorganisms are used to perform the conversion process: anaerobic digestion, fermentation, and composting. Glycoside hydrolases are the enzymes involved in the degradation of the major fraction of biomass, such as polysaccharides present in starch and lignocelluloses. Thermo stable variants (enzymes) are gaining increasing roles as catalysts in biomass applications in the future bioeconomy (since recalcitrant biomass often needs thermal treatment for more efficient degradation).This biomass by applying many conversion processes and various techniques can produce Biofuel, Biogas. The bioenergy is embodied as biomass and the result of it is Biofuel.

### 3. Biofuel

A Biofuel is a fuel that is produced through contemporary biological processes, such as anaerobic digestion, rather than a fuel produced by geological processes involved in the formation of fossil fuels, such as coal and petroleum. Biofuel can be derived directly from plants (i.e. energy crops), or indirectly from agricultural, commercial, domestic, and/or industrial wastes. Renewable Biofuel generally involve contemporary carbon fixation, such as those that occur in plants or microalgae through the process of photosynthesis. Other renewable Biofuel are made through the use or conversion of biomass (referring to recently living organisms, most often referring to plants or plant-derived materials). This biomass can be converted to convenient energy-containing substances in three different ways: thermal conversion, chemical conversion, and biochemical conversion. This

biomass conversion can result in fuel, in solid, liquid, or gas form.

This new biomass can also be used directly for Biofuel. Biofuel are in theory carbon-neutral because the carbon dioxide that is absorbed by the plants is equal to the carbon dioxide that is released when the fuel is burned. However, Biofuel that is carbon-neutral also depends greatly on whether the land which is used to grow the Biomass needed to be cleared of carbon-holding vegetation if not then the fuel produced is generally carbon-neutral. Bio fuels are Bio alcohols, Biodiesel, Bio oil, Bio ethers, In the production of Biofuel many bacteria and fungi are also involved. The best way to increase the production of Biofuel by the conversion of biomass is Biorefinery.

#### 4. Biorefinery

A biorefinery is a facility that integrates biomass conversion processes and equipment to produce fuels, power, heat, and value-added chemicals from biomass. The biorefinery concept is analogous to today's petroleum refinery, which produce multiple fuels and products from petroleum.

Biorefineries has defined as the sustainable processing of biomass into a spectrum of bio-based products like Biofuel. By producing multiple products, a biorefinery takes advantage of the various components in biomass and their intermediates therefore maximizing the value derived from the biomass feedstock .Biorefinery is a practical method of improving the economic performance of stand-alone biomass to bioenergy system since biochemicals are produced.

#### 5. Biomass as biofuel through biorefinery

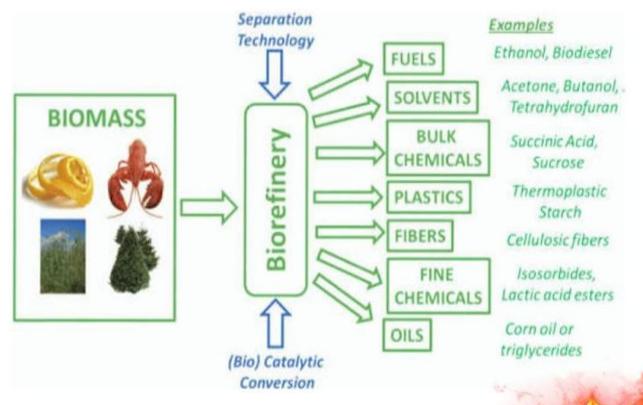
A biorefinery could, for example, produce one or several low-volume, but high-value, chemical or nutraceutical products and a low-value, but high-volume liquid transportation fuel such as biodiesel or bioethanol (see also alcohol fuel). At the same time generating electricity and process heat, through combined heat and power (CHP) technology, for its own use and perhaps enough for sale of electricity to the local utility.

The high-value products increase profitability, the high-volume fuel helps meet energy needs, and the power production helps to lower energy costs and reduce greenhouse gas emissions from traditional power plant facilities. Although some facilities exist that can be called bio-refineries, the bio-refinery has yet to be fully realized. Future biorefineries may play a major role in producing chemicals and materials that are

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traditionally produced from petroleum. Several potential biorefinery examples have been proposed, starting from feedstock's such as tobacco, flax straw and the residues from the production of bioethanol. Biorefineries have also been proposed to gather as much materials from trees (i.e. cellulose, lignine, lipids) as possible.



#### 6. Visionary aspect

**Biofuel watch** is a non-governmental environmental organization based in the United Kingdom and the United States, which works to raise awareness of the negative impacts of industrial biofuels and bioenergy, on biodiversity, human rights, food sovereignty and climate change, human rights abuses, the impoverishment and dispossession of local populations, water and soil degradation, loss of food sovereignty and loss of food security. It opposes the expansion of industrial monocultures driven by demand for bioenergy, and instead advocates for food sovereignty, agro ecological farming practices, ecosystem and biodiversity protection and human rights.

#### 7. Conclusion

Every renewable energy resource has its own benefit and use, but biomass and biofuel are interlinked with many of the processes that can balance the pollution control. Being a very effective alternation biomass and biofuel has benefited mankind through biodiesel mainly.

The best application of this is biorefinery. This review above is to enhance biomass and biofuel utilities Biofuel watch is an initiation for the motto that has been structured above so to hit the sack for renewable earth this is a great awareness option.