

## Biofuel: A Step towards Energy Security

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Today with the increasing population, pollution is also increasing rapidly. This has resulted in global warming and increase in the green house gases. There are various factors leading to pollution like deforestation, vehicles emitting gases, other electronic items etc. Although now days various environment cleanliness missions are coming up but there has been little done on the vehicles and products which uses fuel as a source of energy.

The need of sustainable use of fuels is very important because the time to generate fossil fuels takes decades for its formation. The speed with which we are using now it will not be available for our future generations. Therefore, there comes the need for alternatives. With the advent of biotechnology, this has also become possible [1].

Biotechnology is the science which uses biology for its processes that will help to improve the life and health of the earth. This technology uses organisms, cells or cellular components to exploit them and form new technologies [2]. One of the major applications of biotechnology is biofuels. The need for biofuel is mainly the energy security and the benefit to local communities.

Biofuel is a fuel which is generated through biological processes and digestion of the microorganisms. This is mainly derived from biomass i.e. living matter. The most widely used biofuels are biodiesel and bioethanol. these can be derived from agricultural crops, wood, waste material, organic materials etc. Bioenergy crops such as wheat, molasses, sugarcane, soybean are used to generate biofuels.

The process of bioethanol production is given below.

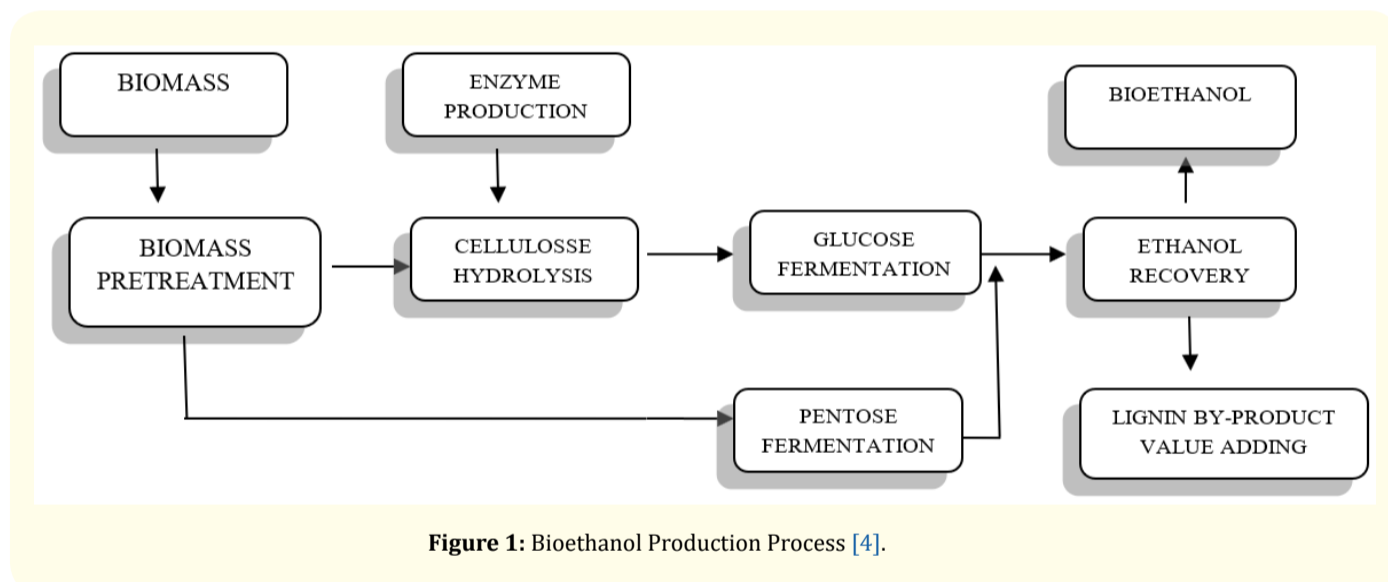


Figure 1: Bioethanol Production Process [4].

The above shown process clearly describes the use of biotechnology in today's world [3]. With the use of waste material and the enzymes one can generate fuel which can further help in renewable, energy balance, an alternative to fossil fuels, economic development, less emission of green house gases therefore environment friendly and many more.

Although there are many advantages of bio fuel but same drawbacks are still there which needs to be overcome in the coming years like: high production cost, monoculture, use of fertilizers, industrial pollution etc [5].

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