

An Update On Biofuels



Most people think all biofuel is an environmentally friendly alternative fuel that should be developed to replace traditional fossil fuels. In reality, this is not entirely true. The most accurate evaluation of biofuels is made by comparing the total energy input over the entire production cycle to the energy output of the fuel.

For example, for corn ethanol, the total energy input includes clearing the land, distribution and planting of the crop, production, distribution, and spreading of fertilizers, pest control, and water, solar energy to grow the crop, energy used for harvesting, transporting, and processing, and, finally, shipping to retailers and consumer refueling. When the total energy input is compared with the energy output of corn-based ethanol, the result, according to most studies, is that for each unit of energy expended in the production of corn-based ethanol, approximately 1.25 units are yielded by the fuel. This is a relatively low figure, but it still is significantly higher than previous results for corn and is believed to be due to increases in crop yield as well as improved farming practices.

These results are typical for other food-based ethanol such as soy. Two additional significant factors against the use of food crops for biofuels are the carbon dioxide that would have been absorbed by the wild plantlife covering the fields if they had not been cleared, and the loss to the food supply of the crops grown to be used for fuel production.

Compare the energy yield of corn to that of switchgrass, a dominant species of North American grass that grows wild in many locations throughout the country. Switchgrass delivers 540% more energy than it uses during growth, harvesting, and processing. It seems that this and other similar species would be the preferred biofuel source to corn & soybeans.

The nation's corn producers, not surprisingly, argue that considering all input energy as equal is misleading, even dangerous. They say that input energies are not equal because their relative cost and "quality" are not equal. The fact that petroleum is suited for making liquid fuel and coal and natural gas are not, to them, makes the argument that input energy cannot be added on a one-to-one basis.

Recent improvements in efficient production of ethanol made from the action of specific types of algae on waste plant material, such as sugar cane, rice, or corn waste and heretofore unused plant products such as switchgrass have launched this technology to the forefront of the biofuel industry. In addition to being orders of magnitude more efficient than food-based fuel, this source material does not carry the additional disadvantages of lost carbon dioxide absorption and food supply loss mentioned above for food stocks used for ethanol production. Naturally, increased use of solar and other renewable energy sources in biofuel production will optimize the energy balance.

In the Energy Policy Act of 2005, the U.S. government has increased the amount of biofuel which must be mixed with gasoline in the U.S. to 7.5 billion gallons a year. That's not much, however, when you consider that 140

billion gallons of gasoline are used annually in the U.S.

At any rate, the market for biofuel is large and there are a number of companies that are developing facilities to keep up. Three such companies are Solazyme, Green Fuels, and Coskata.

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Coskata, Inc. - <http://www.coskata.com/>

GreenFuel Technologies Corp. - <http://www.greenfuelonline.com/>

Solazyme, Inc. - <http://www.solazyme.com/>