

Biofuels essay examples

[Engineering](#), [Aviation](#)



Bio-fuels

Bio-fuel is a form of energy which is obtained from renewable animal and plant materials. They include; Ethanol, biodiesel, green diesel and biogas. The development of bio-fuels can be categorized into three generations; the first, second and third. Bio-fuel crops such as sunflower, corn, sugarcane, and rapeseed are used to directly produce and process the first generation of bio-fuels. A good example is ethanol. In the United States, ethanol is manufactured from corn, whereas in Brazil sugarcane is used. In the case of second generation, bio-fuels are manufactured from plant lingo-cellulosic materials. Agricultural waste materials, forestry, poplar, willow, perennial grasses etc. are also used to manufacture the second generation. The third generation bio-fuels are manufactured from algae. It is the most viable and promising kind due to its well advanced technology. Green diesel is a good example of fuel derived from algae.

The development and potential use of bio-fuels in aviation has been a point of study in the last decade. This is true, owing to the number of reports and studies that have been done to determine the suitability of these fuels.

Recently, Research and Development projects funded by European Commission were initiated to look for a suitable means to introduce these fuels to current users. As perceived by them, it will aid significantly in reducing the use of fossil fuels especially in air transport. Several conversion and feedstock technologies are presently being developed to aid in the production of bio-fuels. In the autumn of 2011, commercial flights that used bio-fuels commenced .

The use of bio-fuels in commercial and military aircrafts has brought about

several positive impacts. Bio-fuels are much cleaner than the fossil fuels. The overall emissions in both military and commercial aircrafts have been reduced significantly. Bio-fuels produce much less carbon and other toxins when burned as compared to fossil fuels. They are hence considered the safest and the best means of preserving the atmosphere. An assessment on the full life cycle of some sources of Bio-fuels has also shown that there is an 80% improvement over the fossil fuels. These improvements can be well reflected by the amount of gases emitted by the bio-fueled aircrafts as compared to the fossil fueled aircrafts. The Military and commercial aircraft owners prefer bio-fuels due to their cleanliness .

Development of bio-fuels in military and commercial aircrafts has also been made easier by the ease in which the new technologies are incorporated into the older ones. Considering the second generation bio-fuels, in the refined form, they are identical to the Jet A-1 fuels which are currently in use. This simply means the advanced bio-fuels can be incorporated into the current supply with ease. No new aircraft, engines or supply systems are needed at airports. This has encouraged commercial aircrafts owners and the military to adopt new technologies .

The cost of bio-fuels is significantly cheaper than fossil fuels. This is particularly due to the availability of sources of production. Bio-fuels provide a broad manufacturing range including manure, crop waste among other by-products. This in turn has facilitated the adoption of bio-fuels in aviation with the aim of cutting costs. The military and commercial airline owners can considerably save on the costs incurred from the use of fossil fuels .

Economically, bio-fuels are considered to be the best option. This is because

they lead to economic stimulation as well as ensure a nation's security on matters pertaining energy. This is so because most, if not all the sources of bio-fuels are produced locally. The military and commercial airline owners of a particular nation are able to rely on their nation for these fuels. This enables nations to reduce or even avoid the dependence on foreign energy. Job creation and growth of the agricultural sector are among other benefits of bio-fuels in the country .

Though bio-fuel development has impacted positively on both the military and commercial aircrafts, it has faced a number of challenges. Most of the challenges faced are mostly concerned with its production procedures and the sources of production. The use of bio-fuel has led to massive food shortages and increased water usage. This in turn leads to increased cost of living. The sources used in production are mostly food crops. Water required to grow these crops as well manufacture the fuel is massive. With the enhancement of bio-fueled commercial and military aircrafts, the demand for food crops has also risen significantly. This leads to hiking of prices and depletion of water sources that in turn affect the cost of living .

As many analysts have noted, the energy output of bio-fuels is much lower than the fossil fuels. The quantities consumed by bio-fuels to produce the same levels of energy produced by fossil fuels is much high. Constant supply and availability of bio-fuels is thus a major concern to both the military and commercial aircrafts owners. This in some way has slowed the development of bio-fuels since a number of analysts tend to think they are not worth it . Several studies have also challenged the production of bio-fuels on matters pertaining to health. Though it is viewed as a safe means of energy, analysts

have refuted this by claiming that the carbon produced during production pose health threats. They have asserted that although bio-fuels are clean while burning, the processes involved in production, including the equipment used in cultivation of crops produce heavy carbon emissions. The machinery involved in the whole production process is deemed to pose significant health hazards. This indirectly affects the commercial and military sectors. With the people involved in cultivating these crops being made aware of the health implications, they tend to refrain from the activity thus leading to a decline in sources of production. The commercial and military sectors end up lacking enough bio-fuel produced energy .

Though the development of bio-fuels has benefited the aviation sector significantly, it does not provide a silver bullet to the energy crisis that affects the world. However, bio-fuels have provided a reliable alternative source of energy. With more research and developments, the challenges of these fuels can be overcome to make them suitable for use in commercial and military aircrafts. Significant growth in technology can also help in minimizing these challenges. Producers of this energy should ascertain better plants that grow quickly, use less land and water. Successful invention of the same will help the energy industry to have a secure substitute to fossil fuel. However, sustainable management, standards and policies should be set to ensure the development of bio-fuels does not impact negatively on biodiversity through destruction of different habitats and ecosystem. As for the commercial and military, these developments will go a long way in improving the ever growing transport sector.

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