

# The role of biofuels essay



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The world is undergoing a transition period between a phase of fossil fuel energy to a phase of clean and renewable energy. There is urgent need for the planet to develop a new range of renewable energy sources which are less carbon intensive and which will open up a new age for fuels. In such a scenario, the 21st century will be a transitional period for energy generation and consumption. It is probable that the world is moving towards a greater diversity in primary sources, in which each country or region, in line with its circumstances, will contribute towards the make up of the renewable energy matrix.

In this context, biofuels will play an important and increasing role. They will not be a substitute for fossil fuels, as such, but a supplement to other renewable primary sources of energy, such as hydro, wind and solar power. Brazil is having a prominent position on the renewable energy sector due several reasons. Around 75% of Brazilian Electricity is produced through renewable energy. This is basically due to the huge hydroelectricity infrastructure installed in the Country. But not only hydro is prominent in Brazil.

Brazilian biofuel production is also an example of sustainable energy generation for the world. The favorable combination of available natural resources, suitable soil and climatic conditions, labor capacity and technological ability puts Brazil on the top of the biofuel world market. But it's dangerous to think that biofuels are directly linked with sustainability. Depending on the way they are produced, they can generate as much damage to the environment as fossil fuels do. The main issue that is being discussed now is so called ' ILUC (indirect land use change).

It's easy to monitor whether a crop to produce fuels substitutes or not a forest. However, it's almost impossible to monitor whether a new crop caused indirect deforestation. A clear example for that is the substitution of cattle for sugarcane production in Brazil. In a first sight, the sugar cane production doesn't cause deforestation. But how to monitor the new place where the cattle is been produced? This is one of several issues that are involved with biofuels sustainability and need to be further monitored and discussed.

To ensure the minimization of positive externalities in the biofuels production, consideration must be given to three basic principles: the introduction of government rules to encourage and regulate sustainable production of biofuels; the concept of vertical growth, with best use of available resources; and the encouragement of research and development of new technologies. In terms of government incentives, it doesn't necessary meaner subsidies, as USA does with ethanol from corn. New legislation frameworks need to take place to foster the utilization of this source of energy.

The United States and the European Union, for example, have standalone targets for increased use of biofuels. In the development programs (REFS and DIRECTIVE 2009/28/SEC), always linked to sustainability criteria, which address some of the major biofuels sustainability factors, such as: food security, working conditions, regional development, social inequality between classes and regions (employment and earnings in countryside), environmental degradation and greenhouse gas emissions. As for vertical growth, it dialogues straight to the concept of access to energy, which must be understood as a social right.

So, in the context of scarcity of natural resources, it is necessary to ensure an energy supply at low environmental cost and reasonable prices, for the whole population. In this situation, the biofuel sector must be capable of using available resources to maximum advantage, in other words, to strive for CEO-efficiency so as to produce more from the same resources. This means vertical growth, as opposed to horizontal expansion. This, in turn, calls for more technology and less waste in the search for transversal CEO-efficiency in the biofuels production cycle.

So, when we think about an industry that is struggling in terms of carbon emission and could easily be adapted to change its fossil fuel consumption to biofuels, this is the AIRLINE industry. Currently, this sector represents 2% of global CO<sub>2</sub> emissions, but is expected to grow to 3% by 2050. Indeed, biofuels usage on commercial airplanes was approved in July 2011. Since then, some airlines have experimented with using of biofuels on their flights. But the challenges to make this accomplishment true are not only coming from the biofuel production side. There are still some concerns regarding the technology itself.

Biodiesel that is stored for long periods of time is more likely to oxidize, especially at low temperatures, causing it to gel. Some additives improve the cold weather tolerance of biodiesel, but only by a few degrees. Nitrite-based rubber materials expand in the presence of aromatic compounds found in conventional petroleum fuel. Pure biofuels that aren't mixed with petroleum and don't contain paraffin-based additives may cause rubber seals and hoses to shrink. Airplane manufacturers are starting to use a synthetic rubber substitute called Vitro for seals and hoses.