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Environmental and socioeconomic impacts of Brazilian biodiesel industry in the last 10 years

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The persistence of visionary efforts in academia, private and public sectors, and favorable changes in the socioeconomic, political and energy environment have resulted in the Brazilian biodiesel industry, which has completed a decade recently, with attributes that give pride to all those who contribute on it. Some numbers: Brazil is the second largest producer in the world (3.9 billion liters in 2015). At an average growth rate of 22.6% per year since 2008, is one of the fastest growing industries in the country, with revenues of US$ 2.7 billion in 2015. The biodiesel production reduced by 30% the diesel oil imports in 2014, saving almost US$ 900 MM. Due to the strong growth of vegetable protein demand in recent years and the moderate growth of vegetable oil demand, the biodiesel industry had a role on balancing vegetable oil offer in Brazil. About 20% of total biodiesel feedstock comes from animal fats. Such market generated a value add of more than US$ 300 MM from a traditional waste material. From 2005 to March 2016, the emission of 41 million tons of CO_2eq was avoided by replacing fossil fuels for biodiesel, equivalent to planting 300 million trees. Scientific studies estimate that, just in the city of São Paulo, the increase from mandatory B5 to B7 will avoid 1,200 deaths and 7,300 hospitalizations caused by diseases associated with air pollution, generating an economic gain of about US$ 80 MM to the municipality in 10 years. In 2015, US$ 1 billion, or 28% of the total volume of purchase of raw material came from family agriculture, with more than 70000 families benefited. With a stimulating tax system, the cost of biodiesel is cheaper than the cost of diesel oil in almost half of the Brazilian territory. Studies have still shown that, if the Brazilian incentives offered to biodiesel industry were added to the Federal budget, the positive impact on GDP and job creation would be 15 and 13 times lower, respectively. The increase in the content of the mandatory mixture provided for by the recent legislation; The expected growth of diesel oil demand in the country in the coming years; a scenario of increasing import of diesel oil; the projections of higher relative supply of soybean oil; the environmental commitments assumed at COP 21 suggest the continuation of a strong expansion of this industry in the coming years, increasing the benefits it brings to society.

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Biogas production by grass fermentation

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Due to an increased demand for global energy and to the depletion of fuel sources, it was necessary to search for new sources of energy named renewable energy; one of these sources is the biomass energy. This paper aims to present the ability of biogas production using the remains of grass trimming in the gardens of Near East University by a fermentation process; this biogas will be used then to generate an electric power after being treated. A new design of Biodigester was developed in order to conduct the proposed research and produce the biogas. The experimental results show that the developed Biodigester is able to produce biogas by the fermentation of grass and using some catalyzers. In addition to the design and implementation of the Biodigester, different studies using it were presented in this paper. These studies show that the use of animal waste and improving material for the fermentation process lead to the increase in the amount of methane product on the basis of a single mass of volatile material which is equivalent to 15%. Moreover, other studies and experiments using the designed Biodigester show that the use of animal waste or manure speeds up the fermentation process.

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