## EIGHTH EDITION OF ANALYSIS OF BIOFUELS' CURRENT OUTLOOK

EPE presents, in its website, the eighth edition of Analysis of Biofuels' Current Outlook, with the most relevant events which happened in 2016. The main topics covered are: the supply and demand of ethanol and its production and transportation infrastructure, the participation of bioelectricity in the national energy matrix and in energy auctions, and the biodiesel market. The last section of the document contains an article that analyzes the role of tax differentiation as an instrument of public policy to stimulate the biofuels market in Brazil.

In 2016, the edition highlight focused RenovaBio, an initiative launched by Ministry of Mines and Energy, aiming to expand the biofuels production in Brazil.

This edition shows that the combination of several factors provided new production records for the sugarcane segment: the sugarcane processing reached 670 million tonnes, while sugar production, with growth of 14% compared to 2015, reached 39 million tonnes. Due to the high average price of this commodity in the international market, which increased the attractiveness for its production in detriment to that of biofuel, there was a 7% reduction in ethanol volumes, which totaled 28.3 billion liters.

The area marked to the sugar-energy sector grew 4.6% compared to the previous harvest, reaching 9 million hectares. However, the average age of sugarcane increased significantly, due to the option for part of the sector to amortize its debts, instead of renewing the cane field. This reduced agricultural productivity to 72.6 tc/ha, and consequently limited the amount of sugar cane available for harvest. Sugarcane yield increased by 2.4% to 134.6 kg ATR/tc in the 2016/17 crop.

The chapter on the demand for ethanol addresses the situation of the declining licensing of light vehicles and motorcycles (20%), maintaining a trend started in 2013. Despite the significant reduction in vehicle sales, Otto Cycle fuel demand dropped only 1.6%. Some aspects related to licensing are discussed, such as: default rate, household indebtedness, average real income of employed people, unemployment rate and credit for the acquisition of vehicles. The share of the flex fuel category in the national light vehicles fleet represented 71% in 2016.

In 2016, there was a rise in ethanol prices, driven mainly by its lower supply. The relationship between average prices of hydrated ethanol and C gasoline (EP/GP)[1] remained unfavorable to biofuel in several states. The national average ratio (EP/GP) was 71%. Thus, while consumption of C gasoline grew by 3%, rising to 42.5 billion liters,

[1] EP/GP – Ethanol prices / Gasoline prices.

the demand for hydrous ethanol decreased 17%, reaching 15.6 billion liters. In early 2016, hydrated ethanol stocks were at lower levels than those observed in the previous year.

The chapter on Bioelectricity acknowledges the significant contribution of sugarcane plants, exceeding by 12% the amount injected by them into the Interconnected National System SIN[2] in 2015, reaching 2.8 GWméd.

Regarding biodiesel, the document shows that its production was 3.8 billion liters, 3% lower than 2015. It should be noted that, on March 23, 2016, Law 13,263 was sanctioned, which changed the mandatory biodiesel percentage to 8%, 9% and 10% by 2017, 2018 and 2019, respectively.

The total volume of ethanol exported in 2016 was 1.8 billion liters. Following the trend of recent years, Brazil continues to import expressive volumes of ethanol, having acquired 0.8 billion liters in 2016.

Regarding the item Cellulosic Biofuels, it states that for 2G ethanol to be available in large volumes and at competitive prices, the development of the technology still presents problems to be solved, mainly in the pretreatment, filtration of lignin and enzyme prices.

The use of liquid biofuels contributed to avoiding the emission of 64 $MtCO_{2eq}$ in 2016. Bioelectricity also contributed to avoiding the emission of 3 $MtCO_2$ in 2016. This contribution is relevant in face of the international agreements signed by Brazil to reduce GHG emissions.

The eighth edition of the Analysis of Biofuels Current Outlook closes with a text assessing the tax differentiation as an instrument of public policy to stimulate the biofuels market in Brazil. The government of Minas Gerais state made tax changes to stimulate increased consumption of hydrous ethanol replacing the use of gasoline C in the supply of light vehicles. The changes in ICMS (Tax on the Circulation of Goods and Services) impacted fuel prices and, consequently, the EP/GP ratio. The combined action to reduce ICMS tax on hydrous ethanol and raise this tax on gasoline C led to an increase in the demand for biofuel, as well as the collection of ICMS tax on fuels. In addition to the positive tax impacts, employment generation and the reduction of GHG emissions, stemming from both ethanol and bioelectricity consumption, are also considered. Measures of this magnitude underscore the responsibility of the states in driving the solutions necessary for biofuel's growth in Brazil, supported by the societal, environmental and economic pillars.

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[2] SIN is a system of production and transmission of electricity in Brazil, that includes the South, Southeast, Center-West, Northeast and part of North region.