FIFTEENTH EDITION OF ANALYSIS OF BIOFUELS' CURRENT OUTLOOK

The Analysis of Biofuels' Current Outlook, one of the main publications of the Energy Research Office (EPE), presents the relevant facts that occurred in the year prior to its publication. Its fifteenth edition presents the impacts generated in sugarcane production, which achieved records in sugarcane crushing and sugar production, as well as maintaining the growth of corn ethanol. The Otto cycle fuel consumption registered its historic maximum, with hydrous ethanol gaining market share from August. In biodiesel sector, the mandatory addition on diesel has raised for 12% by volume (B12) from April and remained constant throughout the year. The National Biofuels Policy (RenovaBio) concluded the fifth cycle of CBIO traded in stock exchange market.

The main topics covered annually in this document are ethanol supply and demand and its production and transport infrastructure, biomass in electricity generation, biodiesel market, international market for renewable sustainable fuels, the RenovaBio monitoring, besides the new biofuels, such as biogas, sustainable aviation fuels and for water use and renewable hydrogen. This year, the final article has as its central theme an analysis of the potential of low-risk land use change techniques in biofuel production in Brazil.

Total sugarcane processed reached 713 million tons in 2023, 19.7% higher than in 2022. Sugar production grew 26.0%, totaling 45.8 million tons and its exports was 31.4 million tons. Regarding sugarcane ethanol, 29.5 billion liters were produced, which, added to the corn biofuel share of 5.8 billion liters (growth of 40%), reached 35.3 billion liters (15.4% higher than 2022). 13.3 million tons of corn were processed for ethanol production, around 10%, with a relevant share from the second harvest, mainly in Mato Grosso. The country increased the positive balance in international ethanol trade (net exports of 2.6 billion liters), increasing export and reducing import levels.

The hydrous ethanol and type C gasoline average prices decreased, respectively, 19.2% and 12.8% compared to the previous year, resulting in a relative price (EP/GP) of 68%, more favorable to consumers' preference for biofuel.

In 2023, 2.2 million new light vehicles were licensed in Brazil, 11.2% more than 2022, keeping the sales level for the fourth consecutive year. The hydrous ethanol demand grew 6.9%, recording 18.1 billion liters, while gasoline type C consumption increased 6.5%, reaching 46.5 billion liters, resulting in an Otto cycle demand of 59.1 billion liters of gasoline equivalent, an increase of 6.5% over the previous year.

The number of electrified vehicles increased from 49 thousand units in 2022 to 94 thousand in 2023, representing a 90.7% increase in licensing. This year, following what happened in 2022, the number of this category of vehicles sold exceeded those powered by gasoline by 64%. In 2023, Brazilian fleet of Otto cycle light vehicles remained at the same level, totaling 39.7 million units, with flex fuel technology representing 84.5% of the total.

Sugar-energy plants injected Bioelectricity into National Interconnected System in an amount of 2.4 GWm, 14% lower than 2022.

Regarding biodiesel, the percentage in diesel mixture was defined by CNPE Resolution No. 203/2023 at 12% by volume since April 2023 and has remained at this value throughout all the year. Its production was 7.5 billion liters, an increase of 19% in relation to the previous year. Soy remains the main raw material, with a 69% share.

The emissions avoided by first generation sugarcane (1G) and corn ethanol, biodiesel and sugarcane bioelectricity in 2023 were 63.1 $MtCO_2eq$, 21.1 $MtCO_2eq$ and 1.4. $MtCO_2eq$, respectively, totaling 85.6 $MtCO_2eq$.

As for biogas, this edition provides a more detailed analysis. Its installed capacity in distributed generation reached 131 MW in 2023, using agro-industrial, animal and urban waste as its input. In addition, its share in the domestic energy supply reached 460 thousand toe. Regarding biomethane, there is an increase in operation and construction registrations at the ANP, in addition to greater participation in RenovaBio. It registers the initiatives at the federal level instituted in 2022 including biomethane in Special Incentive Regime for Infrastructure Development (REIDI, in Portuguese acronym) and establishing the Federal Strategy for Incentive to the Sustainable Use of Biogas and Biomethane.

Among new biofuels, HVO (Hydrotreated Vegetable Oil) and Sustainable Aviation Fuels (SAF), with unit projects being envisaged in the medium term. In the case of HVO, the characteristics that can influence penetration in Brazilian fuel market are presented. As for SAF, the industrial and economic challenges are pointed out so that it can be competitive against fossil-based jet fuel, in Brazil and in the world, and national initiatives for its development. Hydrogen is a future promising bet, with several projects being launched around the world, in a consortium of energy companies.

In 2023, RenovaBio concluded its fifth operational cycle in the organized market, with some adjustments made and internalization of continuous learning. By July 2024, 329 production units were certified, the majority of which were ethanol. At the end of 2023, 33.1 million CBIOs were retired by obligated parties, corresponding to 88% of the target established by the CNPE and 81% of the total individual targets assigned by the ANP, which includes the portion not met by distributors in 2022. The CBIO price remained practically stable, resulting in a weighted average of R$113.59.

The Analysis of Biofuels' Current Outlook also provides an analysis of the of the potential of low-risk techniques for changing land use in the production of biofuels in Brazil, which can serve as a vector for the recovery of areas in Brazil, contributing to the reduction of emissions from the country's main GHG-emitting sector.

The fifteenth edition of the Energy Research Company's (EPE) Analysis of Biofuels' Current Outlook is available on the EPE website at www.epe.gov.br.