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India SMART UTILITY Week 2024

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Session: 1ST INDIA - BRAZIL SMART ENERGY WORKSHOP

Introduction to Biofuels in Brazil



Presented By

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INTRODUCTION – Transportation use of Biofuels in Brazill







- Sugar cane ethanol is the Main Biofuel used in Brazil
- After the 1st world oil crisis, in 1973, Brazil created a National Program called Proalcool in 1975. Transportation use peaked in 1986, but dramatically dropped during the decade of 1990 due to lower oil prices in the international market. The vehicular use of ethanol increased again in the decade of 2000, due to the oil prices and to technological advances with flex motors technology (gasoline and alcohol).
- Sugar cane production in the country grew a lot and the installation of sugar and alcohol
 plants gave a huge quantitative leap. There are approximately 450 plants installed in the
 country, that also produces sugar and electric energy from the sugar cane bagasse.
- By **2004 Biodiesel was adopted in Brazil with the aim of reducing national dependence** on diesel price. The sources of production of this fuel are vegetable oils (produced from seeds, mainly castor beans) and remains of animal fats.
- Biodiesel in Brazil is used as a fuel both in its pure state and mixed with common diesel. The mixture index on diesel was recently raised from 10% to 14%.

RenovaBio – Global Biofuels Alliance





RenovaBio is a Brazilian State program in place since 2017, seeking to adequately promote the expansion of biofuels in the country's energy matrix. It establishes annual decarbonization goals in Brazil, that is, it encourages the reduction in the use of fossil fuels by an increase in the

production of biofuels, which gain greater prominence when replacing traditional energy sources.

• In addition to the goals, the program also has two other strategic axes: certification of biofuel production and the so-called "decarbonization credit" (Cbios). Cbios are issued based on invoices for the purchase and sale of biofuels, as well as the tons of carbon reduced by the company responsible. The certification focuses on registering importers and producers of biofuels, highlighting their contributions to the use of clean and renewable energy.

Brazil and India jointly recently played important roles on the creation of a global agency that concentrates efforts to promote the adoption of these renewable fuels in the global energy matrix – The Global Biofuels Alliance. The meeting was held in Davos, Switzerland, during the World Economic Forum, in January 2024. The main focus is next generation Biofuels.



DIAGNOSIS AND VISION OF THE FUTURE - BIOFUELS









- International expansion for the displacement of fossil fuels (emphasis on transport and industry)
- Expansion of the supply of biofuels (biogas/biomethane and ethanol) from 2030

- New arrangements and business models
- Development of DG and decentralized production
- Innovation and technology driven by digitalization, Circular Economy



- High potential (raw material availability)
- Mature Technologies
- Complementarity with other sources, prox load centers, dispatchability/flexibility

- Greater representativeness in the energy supply
- Efficiency gains in production processes
- Increased competitiveness of sources

- Integrated public policies
- Hydrogen production
- Regional Power Generation Hubs
- Large biomass generators in the role of anchors.



- Production chains and services
- Infrastructure (logistics for biomass centralization, network expansion)
- Failure to consider source attributes (biogas)

- Incentive mechanisms (infrastructure and logistics)
- Development of the production chain

 Greater integration in the sector (and between different industries) with benefits of competitiveness, innovation and technological advances.

Today

Short Term

Long-Term

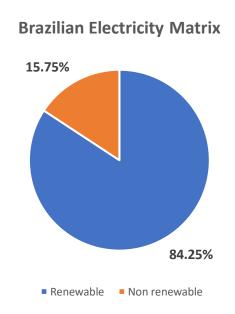
Source: PEE – 2050 – São Paulo State Government Plan to Race to Zero

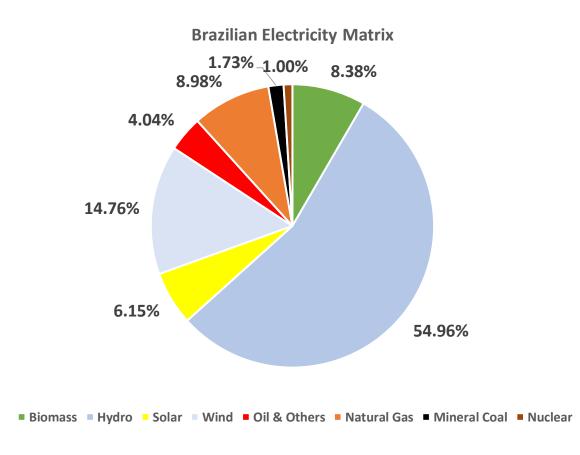
BRAZILIAN ELECTRICITY MATRIX AND BIOMASS











Source: Aneel

BIOMASS ELECTRICITY PRODUCTION IN BRAZIL







Final fuel	Number of Plants	Capacity kW	% Capacity
Sugarcane bagasse	442	12.410.650,20	96,87%
Biogas	6	32.846,20	0,26%
elephant grass	3	49.636,00	0,39%
Rice husk	15	59.458,60	0,46%
ethanol	1	320,00	0,00%
Vegetable Oils	5	17.180,40	0,13%
Animal waste biogas	19	7.272,20	0,06%
Urban waste biogas	26	201.887,60	1,58%
charcoal from urban waste	3	8.250,00	0,06%
urban waste from municipal waste	8	24.413,00	0,19%
Total	528	12.811.914,20	100,00%

Source: Aneel





THANK YOU

For discussions/suggestions/queries email: isuw@isuw.in

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