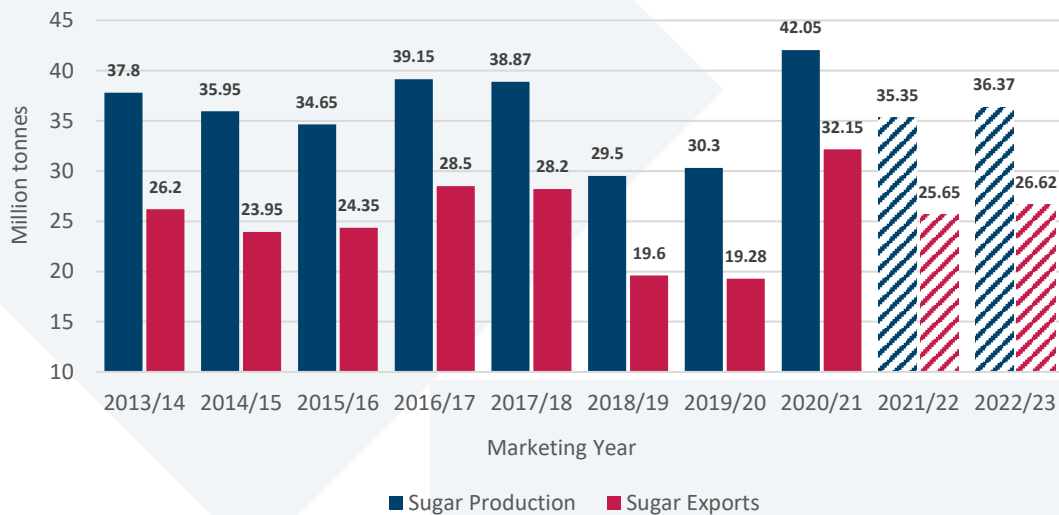


CEFS FACTSHEET ON BRAZIL

OVERVIEW

Brazil is the world's leading sugar producer, representing approximately 20% of global production. More than 10 million of hectares of cane were cultivated (of which 85% harvested) to produce 41 million tonnes of sugar and 32 billion litres of ethanol in 2020/21. Brazil remains the largest sugar exporter worldwide, accounting for over 40 percent of total exports. On average it has exported more than 25.5 million tonnes of sugar (raw value) over the last five marketing years.

Figure 1: Brazil's sugar production in comparison with exports, MY 2013/14-2022/23. Source: USDA



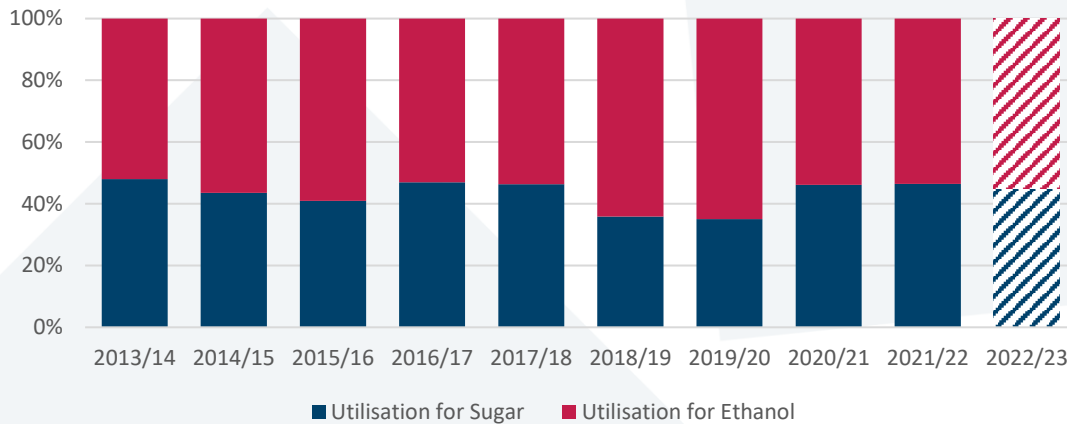
The scale of the Brazilian sugar industry is the result of decades of policy support to both the sugar and ethanol sectors. These initiatives shaped the sugar sector and prepared it to face new challenges of the future.

Many operators have production capacity for both sugar and ethanol, which has allowed them to navigate the recurrent difficulties of each market and maximise efficiencies (arbitrage). The strong growth in sugarcane production over the decades has benefited both sectors, with an almost steady advantage for ethanol over the last decade. In comparison to its competitors on the world sugar market, Brazil has an undeniable advantage, having implemented its biofuel development strategy long before everybody else.

The sugar and ethanol sectors are closely integrated and the markets interdependent; all support provided to the one also benefits the other. For MY 2020/21 and 2021/22, there was shift towards more sugar

production compared to the previous years, when higher ethanol demand combined with less attractive sugar prices favoured more ethanol production.

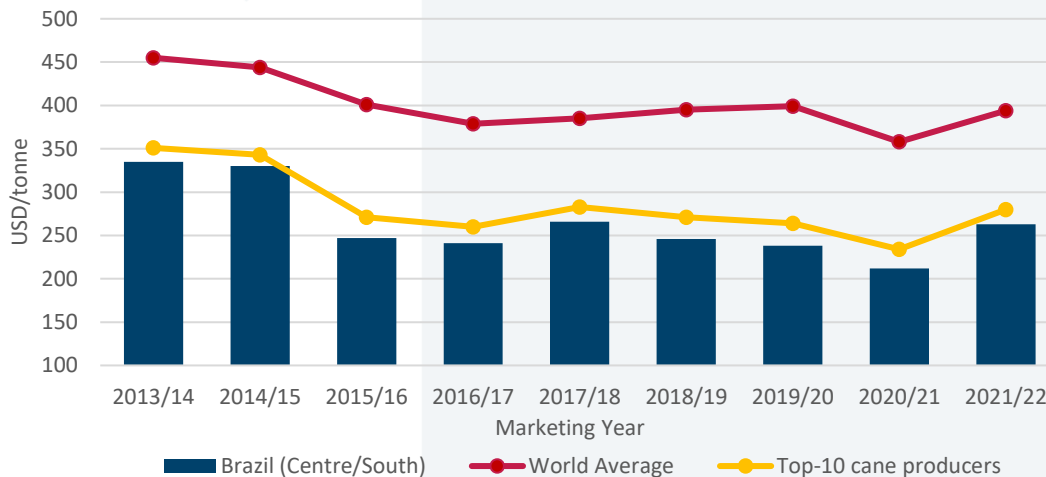
Figure 2: Brazil's Sugarcane Breakdown: Sugar/Ethanol Production Mix, MY 2013/14-2022/23. Source: USDA



PRODUCTION COSTS

The sugar industry of Brazil's Centre/South region, which processes approximately 85% of Brazilian cane, has consistently the lowest production costs in the world. This reflects the sector's exceptional characteristics in field and factory operations. Performance is boosted by the subtropical climate and high altitude of the cane-growing areas, which boosts the sugar content of cane. Field costs are also reduced by the large-scale of farms, the efficiency of mechanised activities and the relatively short distances over which cane is transported to mills. Sugar mills are characterised by low costs, large size and long season length. In addition, they can co-produce ethanol, allowing longer operations than sugar-only mills.

Figure 3: Brazil's production costs compared to world average and top 10 cane producers, 2013/14-2021/22. Source: LMC



ETHANOL POLICY

Brazil is the world's second largest ethanol producer, after the USA. On average over the last decade (2011/12-2020/21), Brazil has produced 30.2 billion litres, consumed 28.4 billion litres, and exported c. 2 billion litres.

RENOVABIO

The latest Brazilian Government support programme is 2018's RenovaBio (National biofuels policy). The objectives of the new alcohol programme are environmental based on the objectives of the Paris Climate Agreement in 2015 (COP 21). The programme creates a regulatory and market framework that incentivises the use of biofuels over fossil fuels to support the decarbonisation of the Brazilian economy.¹ RenovaBio's objective is to boost ethanol production to 40 billion litres by 2030, from 30 billion litres today.

RenovaBio is structured around three main tools:

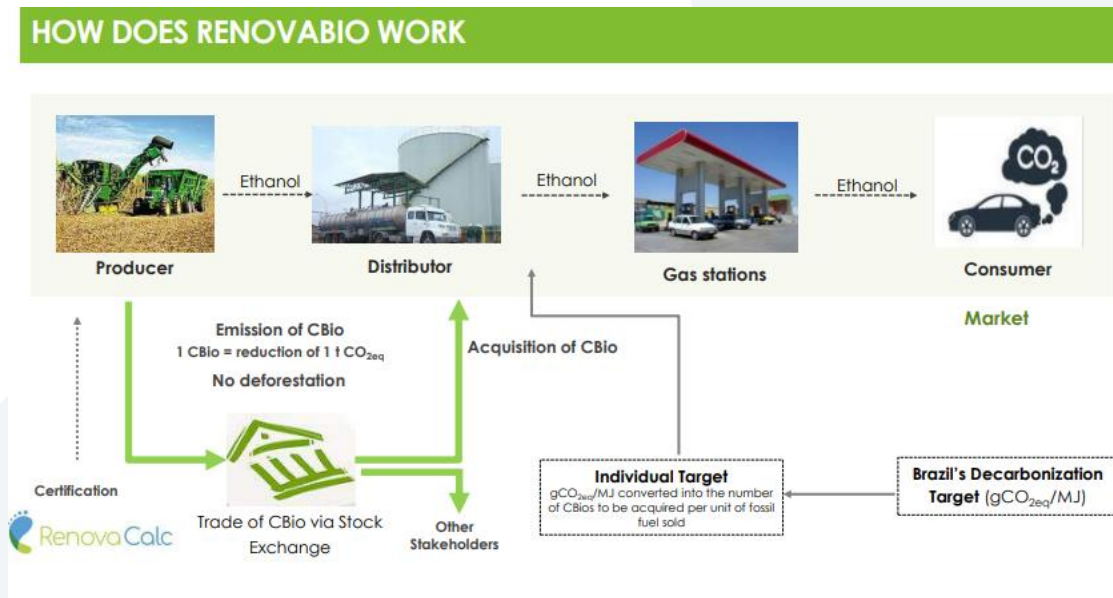
1. Annual carbon intensity reduction (CIR) targets (g CO₂eq/MJ) for fuel distributors, set by the Brazilian Petroleum Agency (ANP)
2. ANP certification of biofuels plants by efficiency in reducing GHG emissions
3. Tradeable decarbonisation Credits (CBio) that are allocated to biofuels producers in line with the GHG savings of their fuel. Each CBio represents one tonne of carbon saved via biofuels.

RenovaBio establishes a captive market for CBios, since fuels distributors are obliged to purchase CBios in order to attain their individual CIR targets. Failure to meet these targets will result in a penalty that is equivalent to the value of the amount of non-purchased CBios, not exceeding five per cent of the distributor's annual revenue as recorded in the balance sheets of the previous two years.²

¹ Decrease of domestic emissions of greenhouse gases (GHG) by 37% by 2025 and by 43 % by 2030

² Decree No. 9308. Available on: http://www.planalto.gov.br/ccivil_03/_Ato2015-2018/2018/Decreto/D9308.htm, P. Vidal Frederighi & L. Vianna Pereira, Baker McKenzie – Environmental Law Insights 'Federal Decree Regulates the National Biofuels Policy', 10 April 2018, retrieved from: <http://www.environmentallawinsights.com/2018/04/10/federal-decree-regulates-the-national-biofuels-policy-renovabio/>.

Figure 4: RenovaBio – a simplified diagram³



Over 2020 and 2021 (until November 2021), the financial volume of CBio market represented respectively USD 120 million and USD 171 million. The amount of CBios to be issued will depend on the volume of biofuels produced/imported and sold by producers and importers authorised to do so.

OTHER POLICY SUPPORT FOR ETHANOL

In Brazil there are two options in terms of ethanol uses at the gas station:

1. E27: the blending mandate for ethanol (anhydrous) into gasoline is 27%. Anhydrous ethanol was mandatorily blended with gasoline since the launch of ProAlcool in the 1970s with a 4.5% blending mandate. Since 2010 the mandate has varied between 20% and 27%, but the higher rate has remained consistently in place since 2015.
2. E100: Hydrous ethanol (100% ethanol). E100 can be used by both ethanol-only and so-called flex-fuel vehicles. The Government promotes the purchase of ethanol-only and flex-fuel vehicles, e.g. by lowering the taxes (IPI) on the manufacturing of those vehicles, which serves to reduce sales prices.

Both anhydrous and hydrous ethanol benefit from preferential tax treatment relative to gasoline:

³ G. Kutas (UNICA). November 2018. Brazil: Carbon credits to promote further the decarbonisation of transports'. Retrieved from <http://english.unica.com.br/download.php?idSecao=17&id=1000064>



- CIDE (Contribution for Intervention in the Economic Domain): since 2015 the tax for gasoline and diesel has been stable at R\$ 0.10/litre, whereas hydrous ethanol (E100) is exempt.
- PIS/COFINS (Social Contributions): is levied at a much lower rate for anhydrous ethanol (R\$/litre 0.1309) than for gasoline (R\$/litre 0.7925). Hydrous ethanol is exempt from PIS/COFINS.
- ICMS (Circulation of Goods and Services) varies between states, but invariably delivers an advantage to hydrous ethanol vis-à-vis gasoline, ranging from -10 percentage points in Mato Grosso to -15 points in Minas Gerais.

SUSTAINABILITY

Brazil's sugar cane production both for sugar and ethanol has been steadily growing over the past years. As a result, sugar cane expansion has resulted in a change in the country's land-use, raising serious concerns about biodiversity loss as well as deforestation (mainly indirect deforestation). In 2019, the Brazilian government cancelled a 10-year-old ban on sugar cane cultivation in the Amazon region. In addition, sugar cane expansion is expected to take over cropland and pasture causing further expansion of farmland over forests and other types of natural cover, with the Cerrado ecosystem and the southern fringe of the Amazon rainforest being the most affected.