

Challenges and opportunities of Brazilian corn ethanol in the global landscape



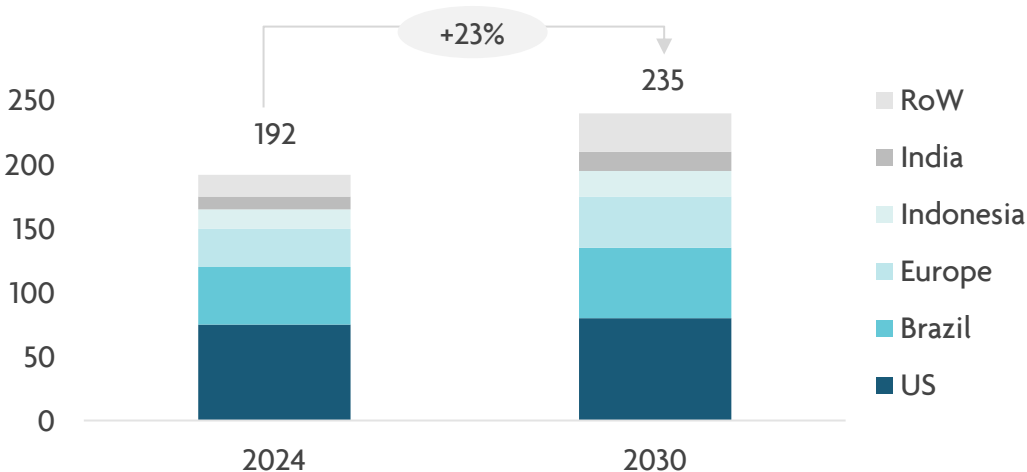
As corn ethanol continues to expand its role in Brazil’s energy mix year after year, Catavento set out an initiative to better understand the drivers behind this growth and assess its potential implications for the energy transition and security globally. This factsheet summarizes the findings from a research project and an engagement process with 40+ stakeholders¹



This analysis is relevant in a context in which liquid biofuels are expected to hold a complementary role in the global energy transition alongside electrification. By 2050, the International Energy Agency projects that the liquid biofuels’ share in total global energy consumption should increase from ~1% today to 3% in both STEPS and NZE scenarios^{2,a}

Liquid biofuel demand is projected to reach around 235 bn liters by 2030, supporting energy security

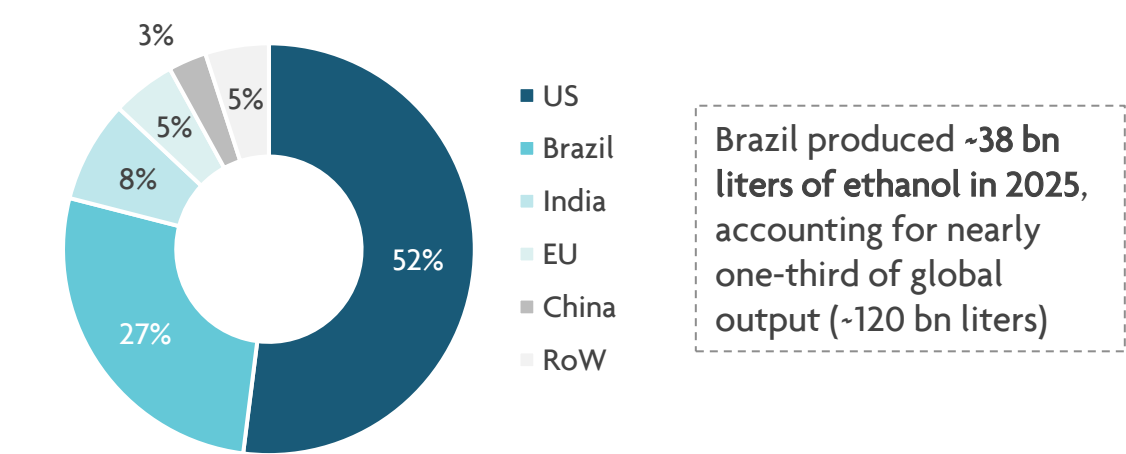
A 23% rise in global biofuels demand is expected by 2030
Global demand for liquid biofuels, bn liters³



- 80% of this growth is expected to come from road transport, while demand from aviation and maritime is set to increase as of 2030³
- Biofuels may have reduced average transport fuel import dependence in net-importing countries from 60% to 55% in 2024³

In this context, Brazil is well positioned to act as a leading ethanol supplier, supported by domestic public policies and market readiness

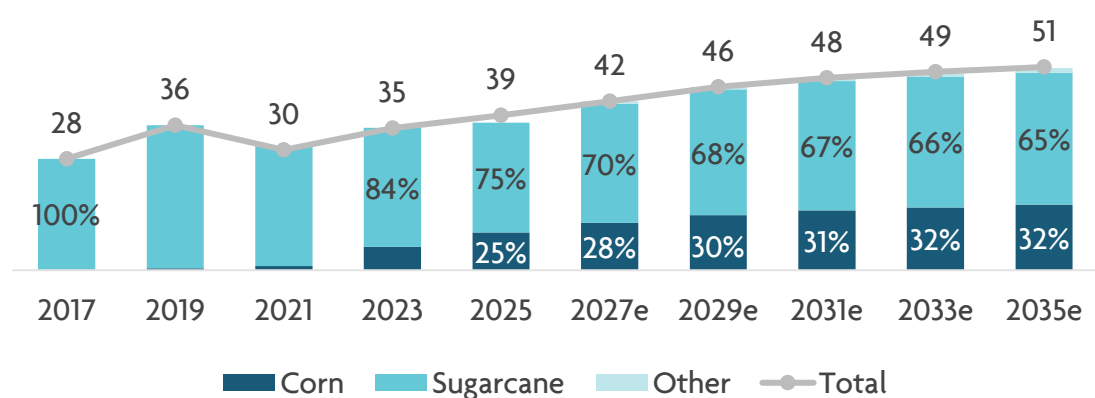
Brazil is the second-largest ethanol producer globally
Global ethanol production by region in 2025, %⁴



- Brazil’s ~30% ethanol blend is the highest globally, backed by a regulatory framework that targets up to a 35% mix
- Around 80% of Brazil’s light-duty fleet is flex-fuel, enabling the use of gasoline-ethanol blends or pure hydrous ethanol⁵

Historically a leader on sugarcane ethanol, the country has experienced strong growth in corn ethanol production since 2017

Corn ethanol may surpass 30% of total production in Brazil by 2035
Total Brazilian ethanol supply, bn liters^{6,7}



- This was driven by its efficient productive system, which generates DDG co-products^b that reduces pressure on land from cattle feed
- Corn ethanol industrial production operates throughout the whole year, acting as a key complement to the sugarcane off-season⁸

Corn ethanol is produced in other countries, but the Brazilian productive system presents key characteristics that make it unique⁹

	BR second- crop corn ethanol	US Corn Ethanol
🏡 Productive model	Second-crop corn grown after soybeans on the same cropland	Uses first-crop corn grown in a single annual cycle
🏭 Carbon intensity^b	17-46 gCO ₂ e/MJ ¹⁰	43-62 gCO ₂ e/MJ ¹¹
⚡ Energy supply	Processing is primarily fueled by biomass	Processing is primarily fueled by natural gas and coal

Still, a wider adoption of Brazilian corn ethanol globally faces risks which should be closely monitored and mitigated

🏡 Food security and land use	🏭 Use of biomass
- Studies indicate that food security has not been materially impacted due to corn ethanol production¹² and that 99% of the fuel produced in 2025 was derived from second-crop systems¹³ - At the same time, most of the corn used is produced in sensitive biomes, such as the Cerrado (~54% of the total deforestation in 2025)¹⁴	- The biomass is sourced mainly from planted forests (e.g. eucalyptus), and agricultural waste⁹ - But the legal use of native biomass by some producers and the need to upscale output raise concerns about the sustainability of large-scale expansion in the central part of Brazil¹⁵

Finally, Brazilian corn ethanol is well placed to help address the global energy transition and security challenges¹

✈️	Brazilian corn ethanol has a role to play in the energy transition, with a potential to be further used notably in hard-to-abate sectors (e.g. aviation, shipping), where electrification is not competitive or viable
🔄	Integrating Bioenergy with Carbon Capture and Storage (BECCS) can be an opportunity for Brazilian ethanol to leverage carbon negative fuels. However, large-scale deployment is hindered by monetization challenges
⚙️	For Brazil's lower carbon intensity to be recognized, it is essential that global stakeholders acknowledge the benefits of double-cropping systems, which could be supported by harmonized carbon accounting frameworks

To unlock its full potential, Brazilian stakeholders should strengthen the competitiveness and sustainability narrative of corn ethanol by focusing on three strategic priorities¹:

- Capitalize on short-term market opportunities** by positioning corn ethanol as a long-term contributor to energy security;
- Strengthen market fundamentals** by expanding long-term demand through supportive policies (e.g. mandates) and carbon pricing, investing in enabling infrastructure, and reinforcing Brazil's image as a reliable supplier;
- Build international confidence** by demonstrating robust sustainability performance through verified data, enhanced traceability, strategic engagement in multilateral forums, and advocacy for harmonized certification and carbon accounting frameworks.

^a The IEA’s Stated Policies Scenario (STEPS) is a scenario based on current policies, announced measures, and official government plans that are considered likely to be implemented, without assuming the achievement of long-term climate targets. The Net Zero Emissions by 2050 Scenario (NZE) is a normative scenario that outlines the pathway to achieve net zero emissions from the global energy sector by 2050, consistent with limiting long-term global warming to around 1.5°C. ^b Distillers Dried Grains (DDGs) are a nutrient-rich animal feed co-product produced during corn ethanol production from the non-fermented components of corn, including protein, fiber, fat, and minerals

1 / Catavento. Challenges and opportunities of corn ethanol. 2026; 2 / IEA. World Energy Outlook. 2025; 3 / IEA. Renewables. 2025; 4 / RFA. Annual Ethanol Production. 2026; 5 / EPE. Demanda de Energia dos Veículos Leves: 2026-2035. 2026; 6 / EPE. Plano Decenal de Expansão de Energia 2035 – Oferta de biocombustíveis. 2025; 7 / EPE. Balanço Energético Nacional 2025. 2026; 8 / EPE. Análise de Conjuntura dos Biocombustíveis. 2025; 9 / Gurgel et al. Contribution of double-cropped maize ethanol in Brazil to sustainable development. 2024; 10 / MME. Certificados da Produção ou Importação Eficiente de Biocombustíveis Válidos. 2026; 11 / Pereira et al. Comparison of biofuel life-cycle GHG emissions assessment tools: The case studies of ethanol produced from sugarcane, corn, and wheat. 2019; 12 / Garofalo et al. Land use change, management, and CO₂ balance of second-crop corn in Brazil. 2025; 13 / FGV. Etanol de milho 2ª safra e o uso da terra no Brasil. 2025; 14 / Mapbiomas. Relatório Anual do Desmatamento 2025. 2026; 15 / TheAgribiz. Disputa por biomassa expõe dilema ambiental do etanol de milho. 2026.