# POTENTIAL FOR BIOFUEL EXPANSION AND ITS EXTERNALITIES

Why are “land-saving” techniques key to reducing impacts and increasing efficiency?

Elaboration: epe 20

A pioneer in public policy for biofuel use, **Brazil** has **over 90 years** of experience with **ethanol** and **20 years** with **biodiesel**, contributing to meet the country's growing energy demand while adding social and environmental benefits. Brazil has one of the **most renewable** energy (50%), electricity (88%), and transportation (26%) **matrices in the world**, a reflection of **public policies** and **high productive capacity**.

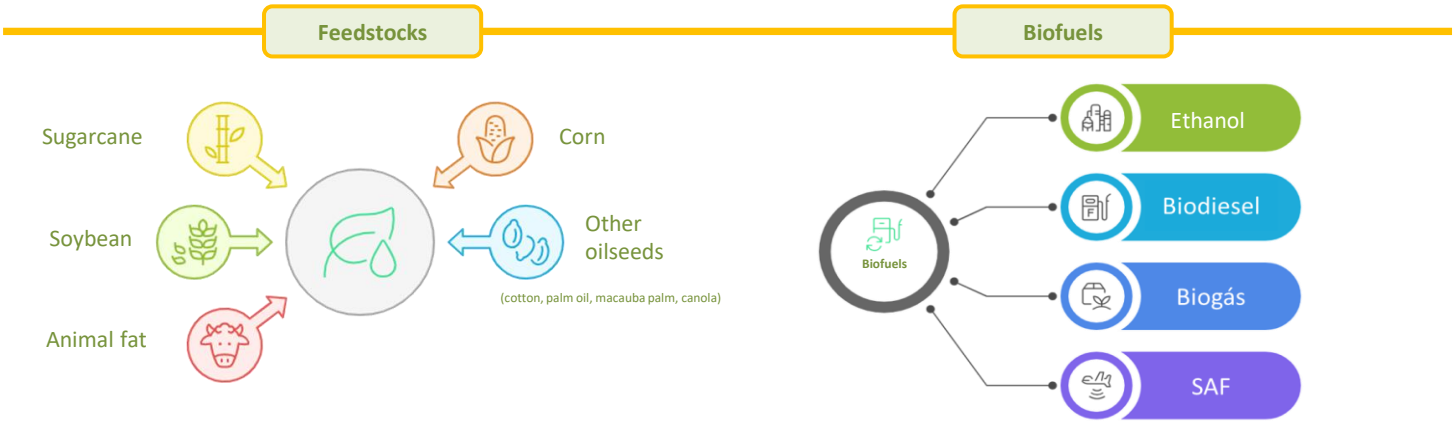
**Brazil holds 60% of the Amazon Rainforest** and yet ranks among the top **five global producers** of **food** and **biofuels**. In 2024, it was recognized as a **global bioenergy power** and achieved a historic milestone: **removed from** the **Hunger Map**, according to the FAO*.

*Food and Agriculture organization of the United Nations

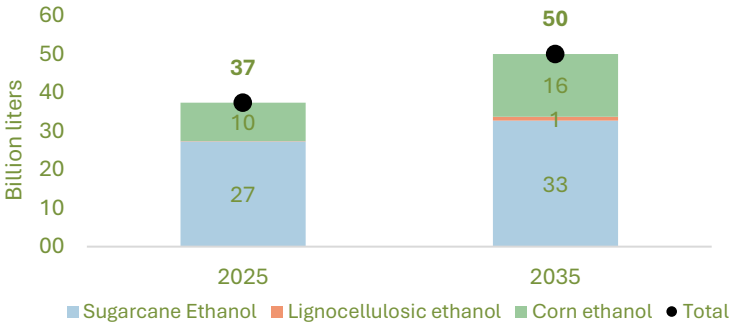
Given the **importance of biofuels for a just energy transition**, **“land-saving” techniques** can increase agricultural production without expanding cultivated areas, promoting both the **sustainable use of natural resources** and the **recovery of degraded soils**. These techniques **reconcile agricultural growth with environmental conservation**, enhancing production resilience in the face of climate challenges.

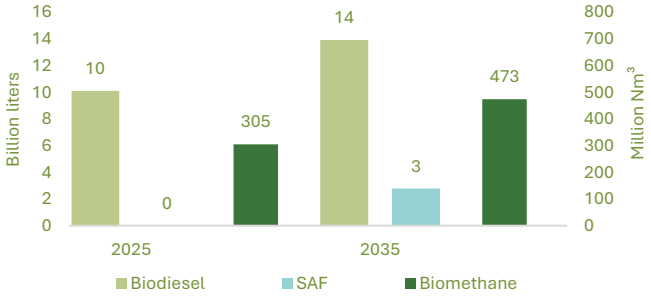
Learn more: Potential of “land-saving” techniques in biofuel production in Brazil

## Main feedstocks for biofuel production in Brazil




The Ten-Year Energy Expansion Plan (**PDE 2035**) estimates that **Brazil** will remain one of the **leading biofuel producers**, thanks to its abundant **natural resources** and the development of **advanced production technologies**, which also boost the **local economy**, promote **energy security**, and generate **jobs**, especially **in rural areas**.




### Biofuel Production Growth

20 billion liters increase projected to meet sustainable fuel demand (ethanol, biodiesel, biomethane, and SAF).

### “Land-Saving” Techniques

The study aimed to quantify how much of the **additional supply** estimated by PDE 2035 could be met through **“land-saving” strategies**, while **respecting current agronomic, logistical, economic, and environmental constraints**.


It also estimated the amount of **food co-products generated**, such as soybean meal, DDGS, corn oil, and sugar.

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## Why are “land-saving” techniques key to reducing impacts and increasing efficiency?

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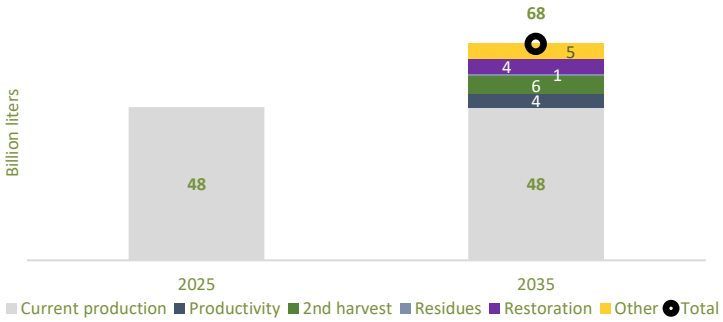
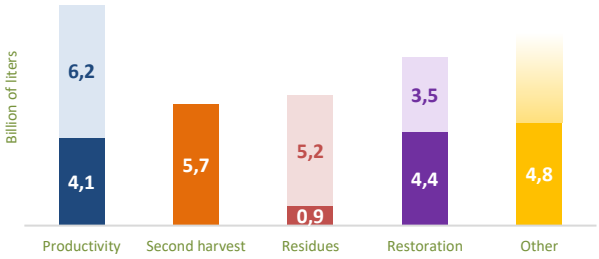
The use of 'land-saving' techniques makes it possible to meet the entire incremental demand for biofuels in Brazil by 2035, using only part of the potential for productivity gains, sequential cultivation of second-crop corn, restoration of degraded land, and other oilseeds in a high-probability scenario — still leaving room for future expansions.

**Energy crops occupy less than 2% of Brazil’s 851 million hectares!**




**Estimate using “land-saving” technique**
**Used potential (dark color) vs Technical potential (light color)**



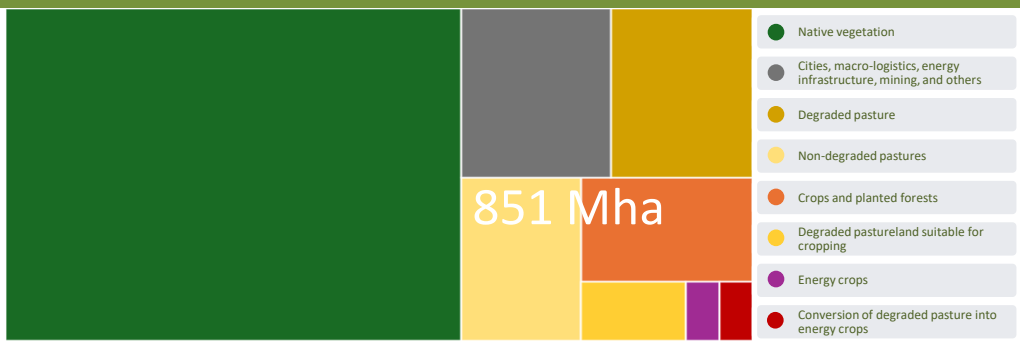

Note: For the second-crop corn, 100% of the production potential was used.

In addition to regenerating degraded areas, biofuel expansion provides impacts related to co-product supply and job creation.

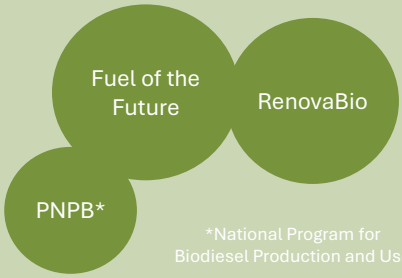
| Co-products | Quantity (Mt) |
|---|---|
| Meal | 12.8 |
| Sugar | 6.3 |
| DDGS (Corn Protein) | 5.1 |
| Corn Oil | 0.3 |

| “Land-Saving” Techniques | Job Creation |
|---|---|
| Second Crop Corn | 7,306 |
| E2G Residues | 2,787 |
| Degraded Land – Sugarcane Ethanol | 67,939 |
| Degraded Land – Corn Ethanol | 723 |
| Degraded Land – Biodiesel | 18,708 |
| **Total** | **97,463** |

**Optimizing land use is vital for biome preservation!**




**BIOFUELS**
National legal framework




Planned and **sustainable bioenergy** expansion can create **productive and institutional synergies** that strengthen the resilience of **food and energy systems**. Brazil is following a successful path, **incorporating family farming** and committing to tackling climate change, eradicating hunger, and **building a fairer, more inclusive, and equal world**.

## WHAT DO THE RESULTS SHOW?

- Biofuels contribute to the high renewability of the national energy matrix and to addressing climate conditions.
- Brazil has followed a successful path in public policies aimed at leveraging the opportunities provided by its soil and climate conditions.
- The application of 'land-saving' techniques allows for increased agricultural production without the need to expand cultivated areas, promoting the sustainable use of natural resources and the recovery of degraded soils.
- The use of 'land-saving' techniques enables the expansion of biofuels without putting pressure on native vegetation.
- Biofuel production can contribute to food supply through its co-products: soybean meal, DDGS, oils, and sugar.
- This expansion could generate nearly 100,000 jobs.
- Public policies that promote an integrated strategy are essential to reconcile food production with renewable energy generation.

Note: Icons used throughout this edition were obtained from the platform www.flaticon.com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Analysis Of Biofuels' Current Outlook

Ten-Year Energy Expansion Plan




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