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Sustainability Challenges and Achievements in the Brazilian Sugarcane Sector

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Institutional Relations

About UNICA

- The Brazilian Sugarcane Industry Association (UNICA) is the largest organization representing the sugar, bioethanol, bioelectricity sectors in Brazil.
  - UNICA's more than 120 member companies represent over 60% of the sugarcane, sugar and ethanol produced in Brazil
  - Offices in Sao Paulo (headquarters), Brasilia, Washington DC and Brussels
- Representing the sector with public entities in **Brazil** and **abroad**, establishing a constructive dialogue with stakeholders (policy makers, academics, opinion-leaders, industry, NGOs, etc), monitoring (and influencing) legislation related to biofuels, sugar and bioelectricity, promoting the Brazilian ethanol image as a clean and renewable energy abroad.

Agenda

1. Challenges
2. Achievements
3. Opportunities

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1. **Challenges**
2. Achievements
3. Opportunities

Mains challenges in sustainability

- Having sugarcane producers attending certain sustainable standards
  - Brazil has 70,000 independent sugarcane producers
  - Very diverse
  - Medium and Small producers have difficulties in attending standards

- Raising the market demand for certified products
  - Market Recognition
  - It would increase the demand by the mills

Mains challenges in sustainability

- Public Policies and Private Markets recognizing the sustainability in the product and production process

Sugarcane Ethanol reduces on avarage 90% of GHG emissons in comparison to gasoline

Agricultural good practices

The generation and the use of bioeletricity

Water reciclying

Expansion on dagraded areas

Agenda

1. Challenges
2. **Achievements**
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Ethanol also means environmental conservation

São Paulo state producers :

❖ **Voluntarily restored 268 thousand hectares** of riparian areas alongside streams and riverbanks[1]

❖**Promoted the Protection of 8,100 springs** and the recovery of surrounding vegetation[2]

❖**Native Vegetation** in Sugarcane Productive area in Sao Paulo state: **1.8 million hectares.** [3]

1 and 2. Data from Environmental Protocol of Sao Paulo State (data from 2007-2015) 3. Source :FBDS

RenovAção

- RenovAção was a retraining program created by UNICA and Feraesp in partnership with Solidaridad, Iveco, Case IH, FMC and Syngenta. It offered practical and theoretical courses for sugarcane rural workers.
- The Program **encouraged similar actions inside the mills**, multiplying the number of trained workers (more than 22,000 trained in the last 4 years)
- *RenovAção*'s actions were the base for the creation of ***Pronatec,*** *a Federal Public Program,* coordinated by the Ministry of Education, that until now, has qualified about 7,000 people.
- International **recognition by FAO** as an "example" among the initiatives that combined renewable energies production with social inclusion.

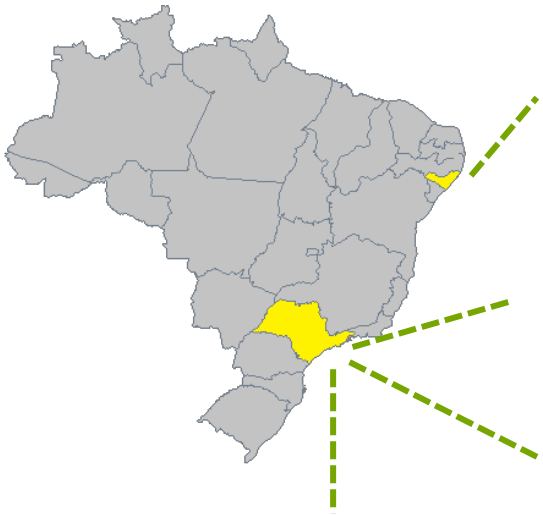
renovAção

2G – Sustainability in Maximizing Biofuels Production

Biomass availability: sugarcane bagasse (already available at production sites) and sugarcane trash (tops & leaves left in the field) need to be collected and transported to the mill.

Technology: at present, enzymatic hydrolysis is the most feasible alternative for 2G ethanol - production can be integrated with 1G; other technologies becoming available to produce sugarcane-derived jet fuel, diesel and 'green' chemicals.

Ethanol 2G



1st unit to produce 2G ethanol in the country (since set/2014) in a commercial scale . It uses straw and bagasse
~ 80 million liters/ year

GranBio

It produces ethanol from sugarcane bagasse
~ 40 million liters/ year[1]

ABENGOA

This project uses sugarcane straw and bagasse
~ 65 million de liters/year[1]

This Project aims to study inovations
~ 3 million liters

São Manoel

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Research Institute and Universities

[1]Productive Capacity

Fare Relationship with Farmers and Chain Certification

CONSECANA-SP

The Council of Sugarcane, Sugar and Ethanol Producers in São Paulo State

- A bilateral private sector arrangement between sugar/ ethanol industry and cane growers that elaborates a **transparent model to define the price paid by ton of cane**.
- Subject to revisions of its parameters and improvement of its rules on a regular basis, the objective is **to make the revenue of the sugarcane grower proportional to the industrial revenue**.

BONSUCRO™
BETTER SUGAR CANE INITIATIVE

An international *multi-stakeholder* certification of best sustainability practices

✓40 Brazilian mills certified out of 47 in the world

✓ 9% of all cane area in Brazil

ISCC
International Sustainability & Carbon Certification

Globally applicable certification system for sustainability and greenhouse gas emissions

✓Also recognized by EU Directive

Agenda

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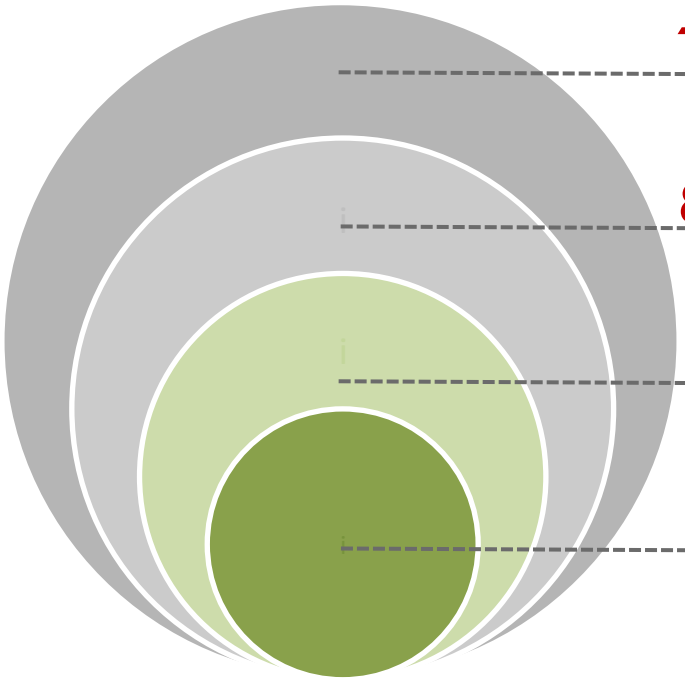
Paris Agreement and The Central Role Played by Biofuels



188 countries presented its INDCs

86 parties ratified the agreement

62 countries have biofuel legislation (mandatory or voluntary)[2]

37 countries mentioned specific commitments to use biofuels in their NDCs[3]

1. According to UN oficial event on April 22nd , 2016.
2 and 3. GRFA

Sugarcane: Strategic for Brazilian emissions reduction

According to Brazilian NDC*, in 2030, the country will have:

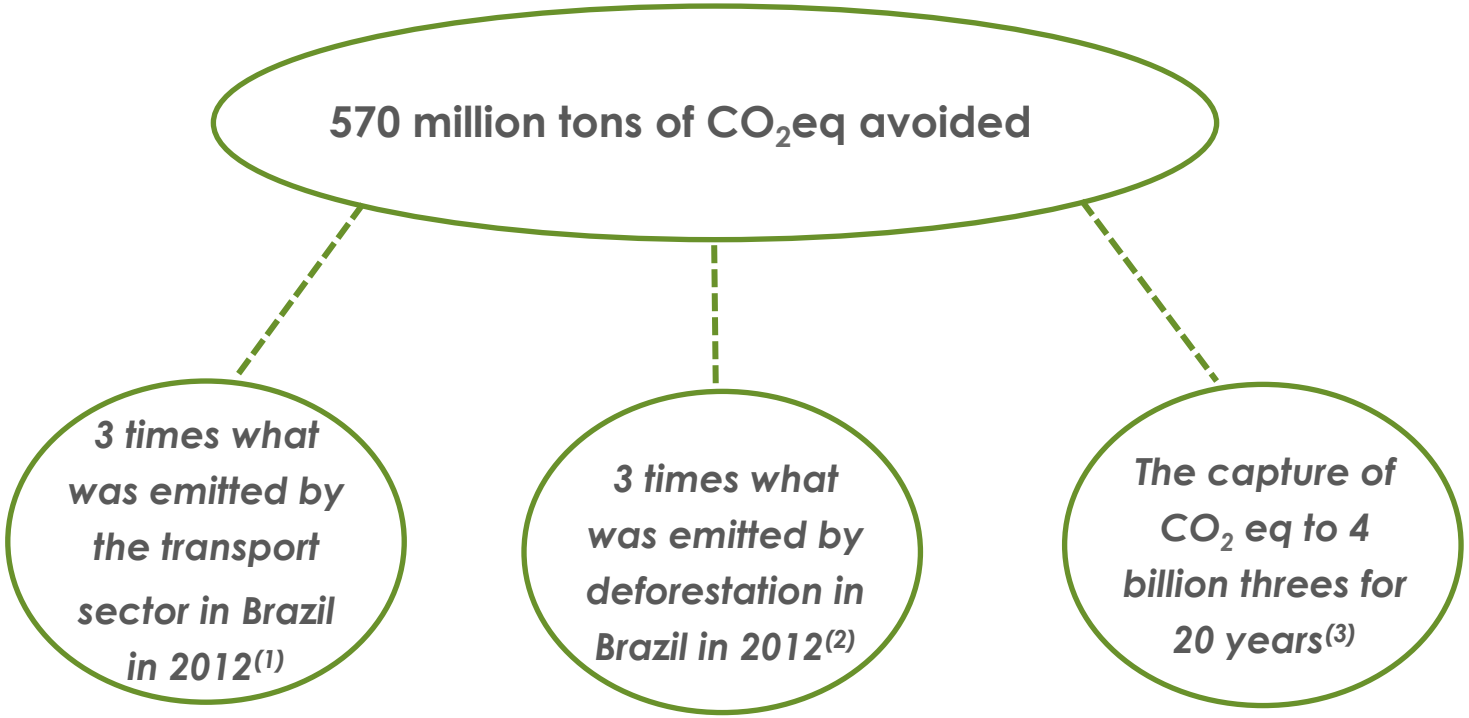
- Reduced its GHG emissions by **43%** below 2005 levels
- Increased the share of sustainable biofuels in the Brazilian energy mix to approximately **18%**
  - Increased the share of renewables (other than hydropower) in the power supply to at least **23%**

Expansion in Bioeletricity is crucial

It means increasing the production of etanol to 45 billion liters in 2025 and 54 billion liters in 2030[1]

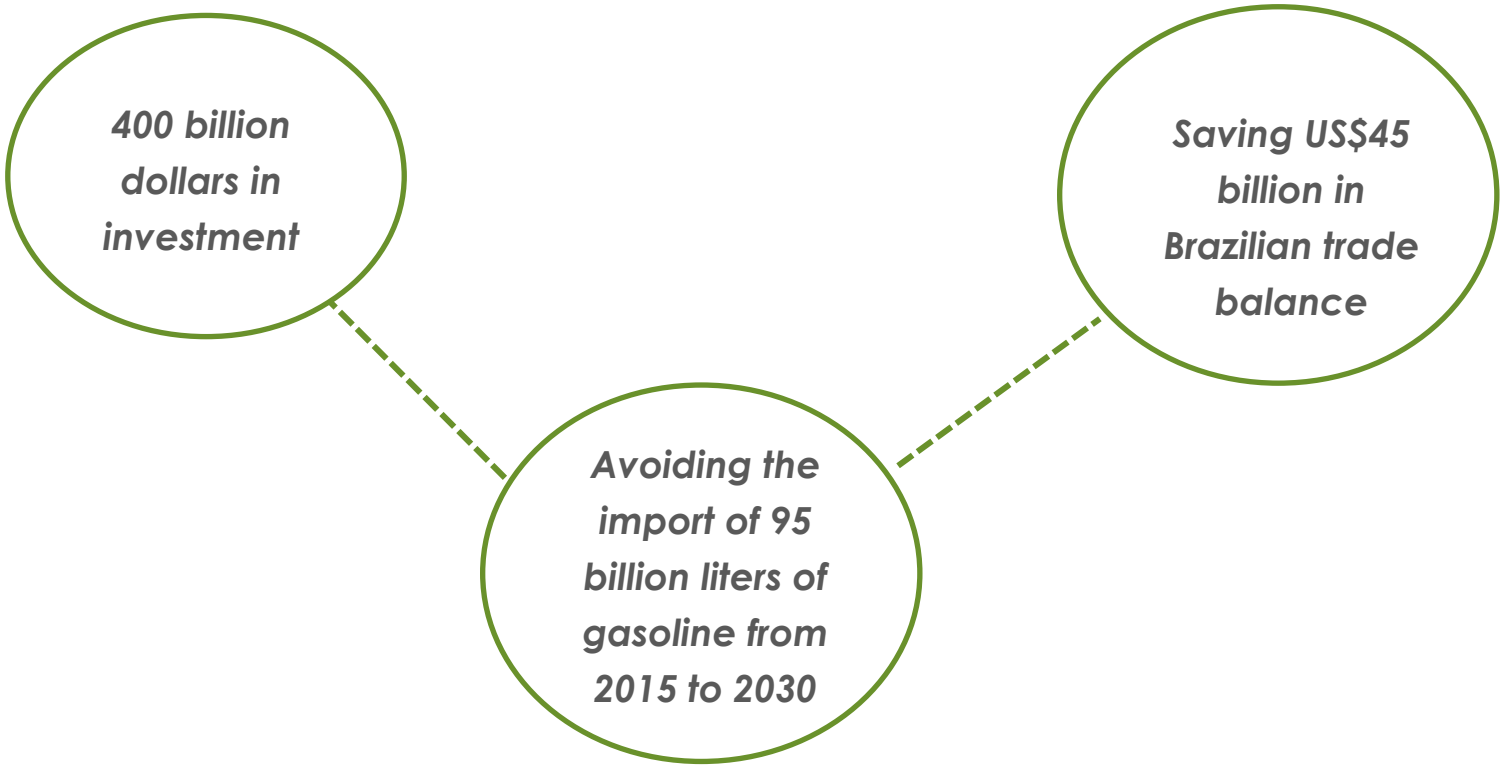
* Nationally Determined Contribution
1. Source: EPE

54 billion liters of ethanol means less CO2 emissions



1 e 2 . Source: Brazilian Ministry for Science , Technology and Inovation

54 billion liters of ethanol means economic growth



Source: UNICA

54 billion liters of ethanol means social development !

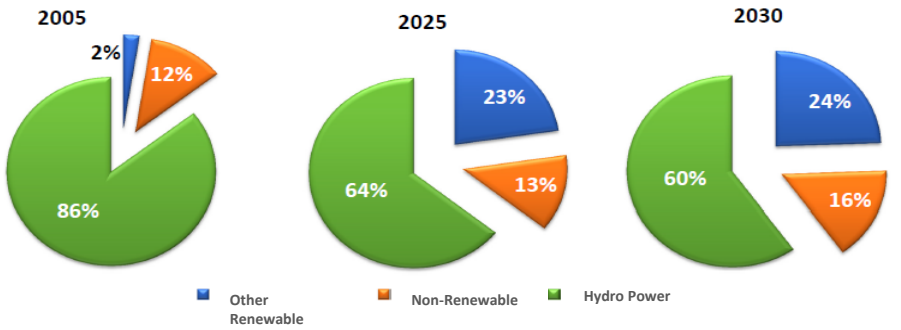
Source: UNICA

Bioeletricity and Brazilian Commitment

By 2030, Brazil will have increased the share of renewables (other than hydropower) in the power supply to at least **23%**

Brazilian Energy Supply(GWh) 2014	590 479	100%
Renewable Generation		
Biomass (includes self-consumption)	44 733	8%
Aeolic	12 210	2%
Solar	-	0%
Total Renewable generation	56 943	10%

Current Scenario

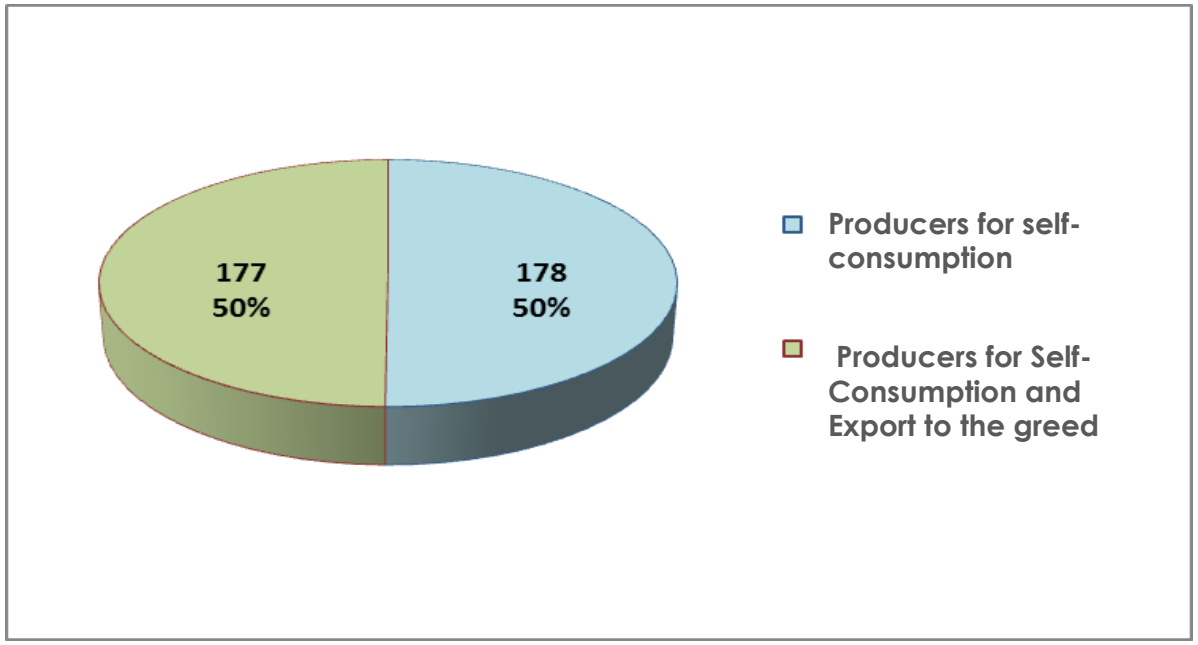


Intended Scenario

Source: EPE and UNICA (2016).

Bioeletricity and Brazilian Commitment

Also , achieving **10%** efficiency gains in the electricity sector by 2030.



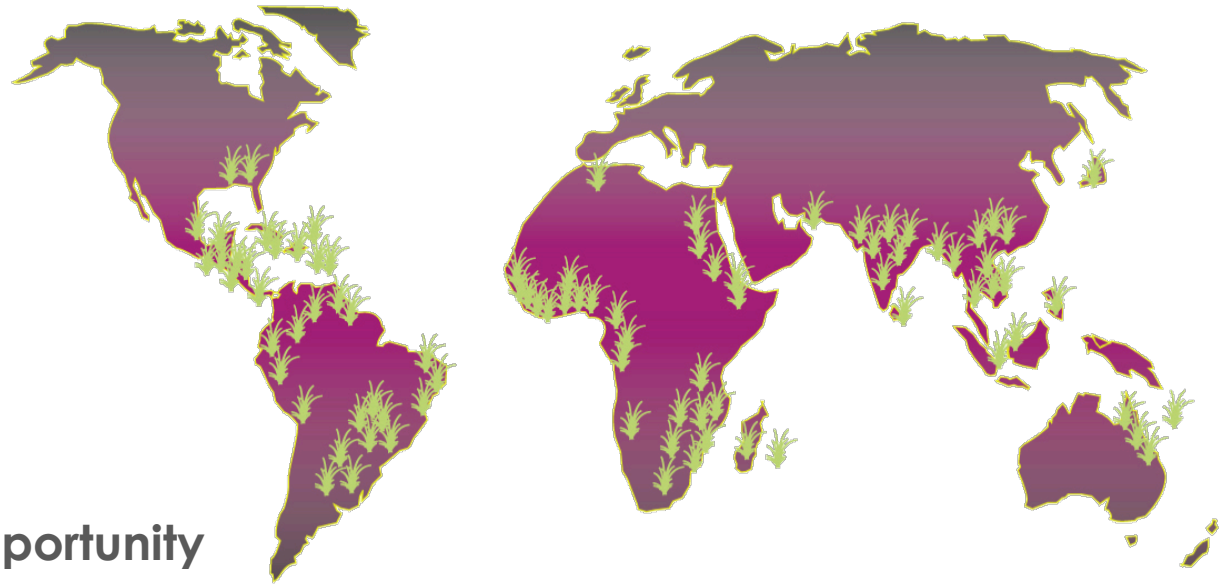
Sugarcane sector can contribute to both commitments:

- ❑ *Retrofit* in mills
- ❑ Biogas from vinasse
- ❑ Different uses for the straw
- ❑ Other solutions

The sector can help both consumers and energy generators.

Source: EPE and UNICA (2016).

Sugarcane: Already produced in more than 100 countries



A great opportunity

- Enhance worldwide energy security
- Provide a sustainable alternative for rural development
- A local solution to fight the global challenge of climate change

Thank you

www.unica.com.br/en

www.sugarcane.org

What if....

What if we had global mandates for biofuel use? Would we need much more land?

Growth in cultivated area to supply the demand for :

A global E-10 mandate → 50 billion liters of ethanol will be needed

Ethanol	Extra Land Needed (ha)	Arable Lands	Cultivated Area
Sugarcane	7.2 million	0.15%	0.46%
Corn	13.2 million	0.27%	0.85%

A global E-15 mandate→ 123 billion liters of ethanol will be needed

Ethanol	Extra Land Needed (ha)	Arable Lands	Cultivated Area
Sugarcane	17.5 million	0.36%	1.12%
Corn	32.2 million	0.66%	2.07%

A Recent Report Supported by US Energy Department States That:

1. Global land is not a limiting fator for biofuel production: farmers have land, but lack access to secure, stable markets.

2. Biofuels can help people out of poverty and hunger:. biofuels can play a big role in fighting hunger if the production is adequately planned.

3. Bioenergy can drive much needed investments in third-world agriculture: Biofuels production could potentially drive investments with positive consequences. Brazil is the perfect example, where investments in bioenergy technology and infrastructure have helped reduce hunger, expanded food exports and promoted socioeconomic development.

4. Flex crops which can serve food, feed, and fuel markets are beneficial for food security: Flex crops for biofuels production can provide a cushion in years of unexpected supply disruptions caused by droughts or other disrupting events.

Source: Kline, K. L., Msangi, S., Dale, V. H., Woods, J., Souza, Glaucia M., Osseweijer, P., Clancy, J. S., Hilbert, J. A., Johnson, F. X., McDonnell, P. C. and Mugera, H. K. (2016), Reconciling food security and bioenergy: priorities for action. GCB Bioenergy. doi:10.1111/gcbb.12366

Brazilian Coalition on Climate, Forests and Agriculture

1. Installed in December 2014, the Brazilian Coalition on Climate, Forests and Agriculture is an initiative formed by business associations, companies, the civil society, organizations and individu1.als interested in contributing to the advancement and cooperation in the Brazil's agenda

2. Brazilian Coalition drafted 17 proposals for public policies and initiatives for conservation and the sustainable use of forests, agriculture and livestock farming.

3. The Coalition also wants to help Brazil to implement its INDCs

BRAZILIAN COALITION

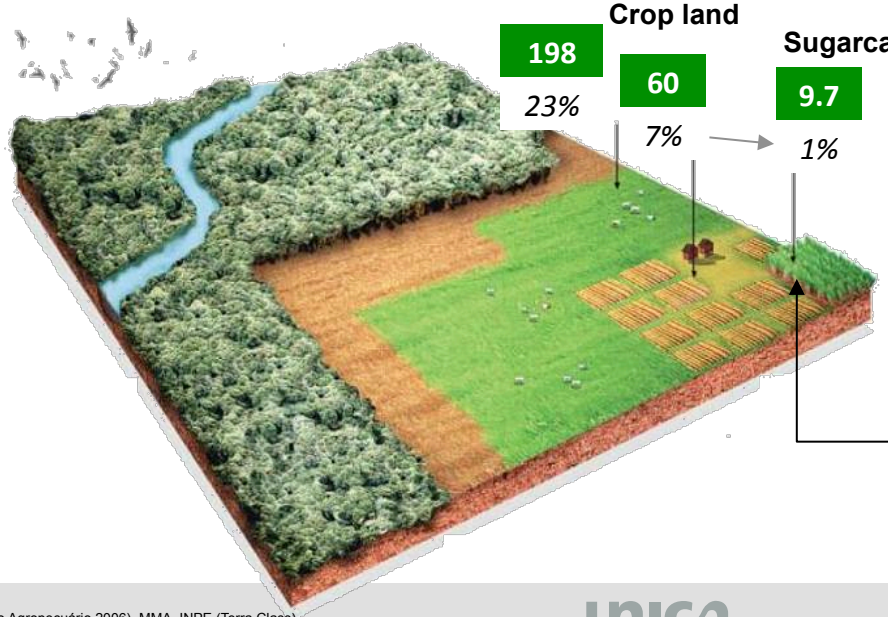
ON CLIMATE, FORESTS AND AGRICULTURE

www.coalizaobr.com.br

Land Availability for the Expansion of Sugarcane Crop

Total area	Native vegetation	Pasture and crop land	Other uses
852	554	258	40
100%	*65%*	*30%*	*5%*

Million hectares



The Sugarcane Agro-Ecological Zoning, elaborated by the Ministry for Agriculture, authorized sugarcane cultivation on 64.7 million hectares (7.5% of the national territory)

Source: ICONE, IBGE (PAM 2010 and Censo Agropecuário 2006), MMA, INPE (Terra Class), Agricultural Land Use and Expansion Model Brazil Ag-LUE-BR (Gerd Sparovek, ESALQ/USP), Produced by UNICA and Cosan.

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Sugarcane Agroecological Zoning

Guidelines for Sugarcane Expansion

1. Excludes sugarcane expansion in the most sensitive biomes

e.g. Amazonia and Pantanal (Wetlands)

2. Forbids sugarcane expansion on any type of native vegetation

(*Cerrados, Campos*, etc.)

3. Establishes authorized areas for sugarcane expansion: **64.7 ml hectares, equivalent to 7.5% of the Brazilian territory**

Zoning guides licensing decisions by environmental agencies.
Public funding for new mills is subject to compliance.