

BRAZILIAN SUGARCANE INDUSTRY ASSOCIATION  
UNIÃO DA INDÚSTRIA DE CANA-DE-AÇÚCAR



# Biofuels: Food, Fuel, and the Future?

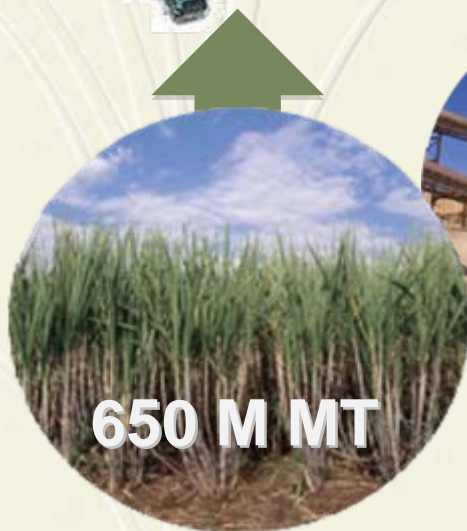
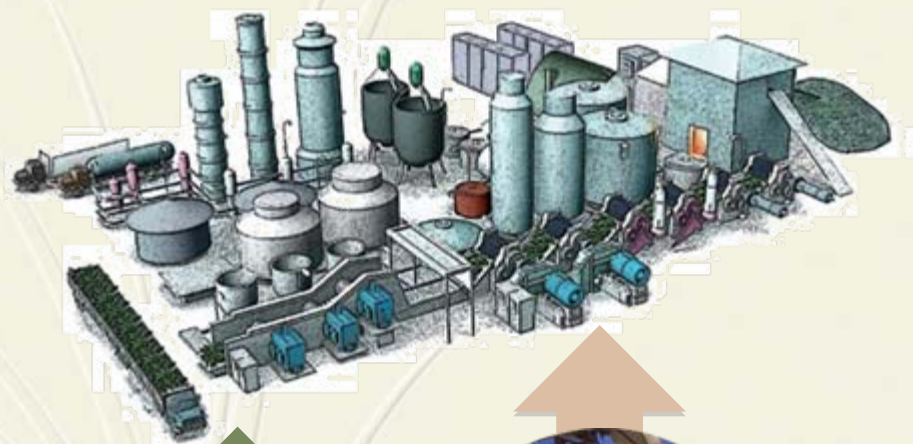
## *Sugarcane's Role as a Sustainable Solution in Bioenergy*

**Joel Velasco**

Chief Representative, North America  
[washington@unica.com.br](mailto:washington@unica.com.br)

# UNICA: THE BRAZILIAN SUGARCANE INDUSTRY

We're the leading sugarcane industry association, representing over 120 producers and mills and responsible for 60% of all ethanol and sugar production in Brazil.



**SUGAR**  
**35 Million Tons**

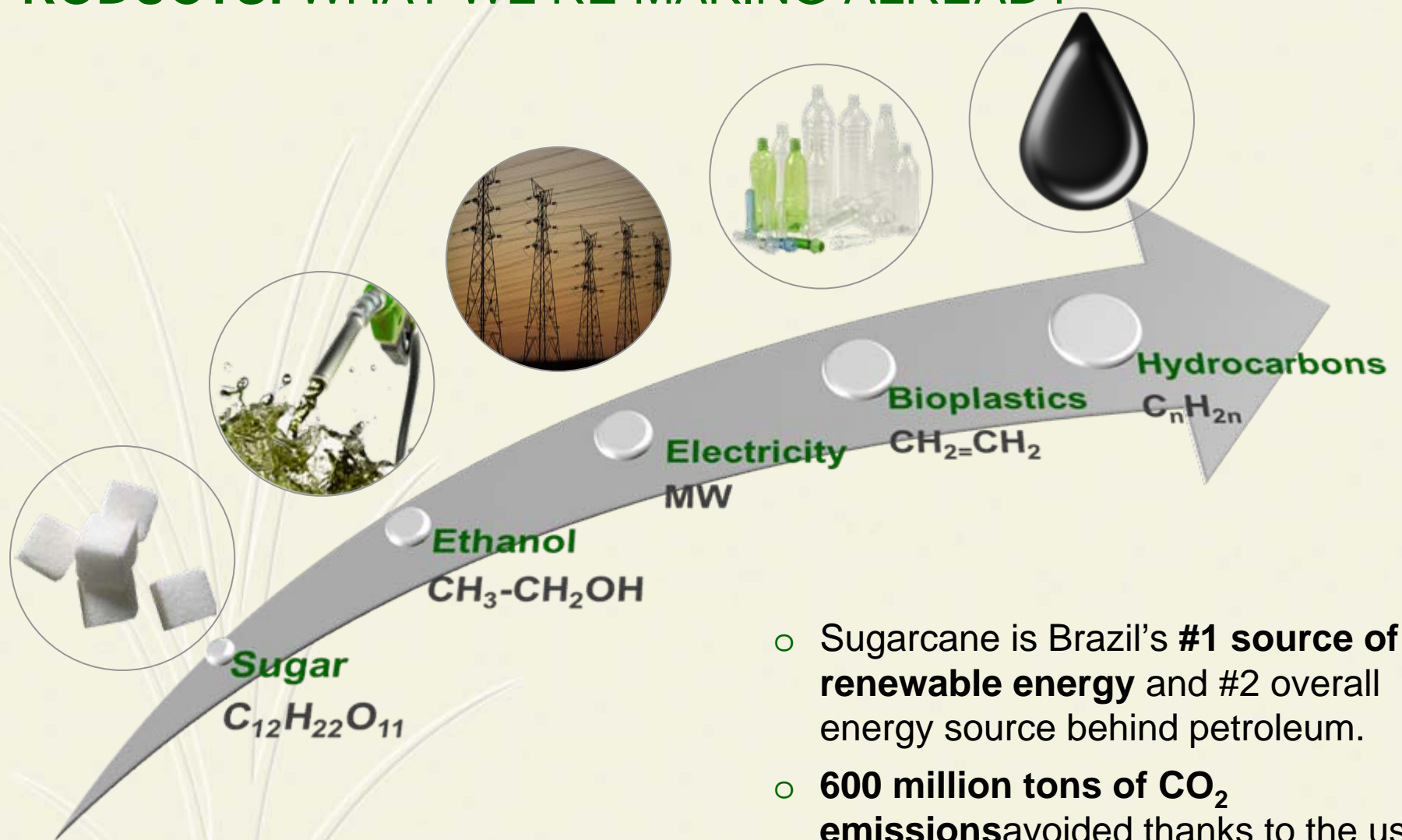


**ETHANOL**  
**7 Billion Gallons**



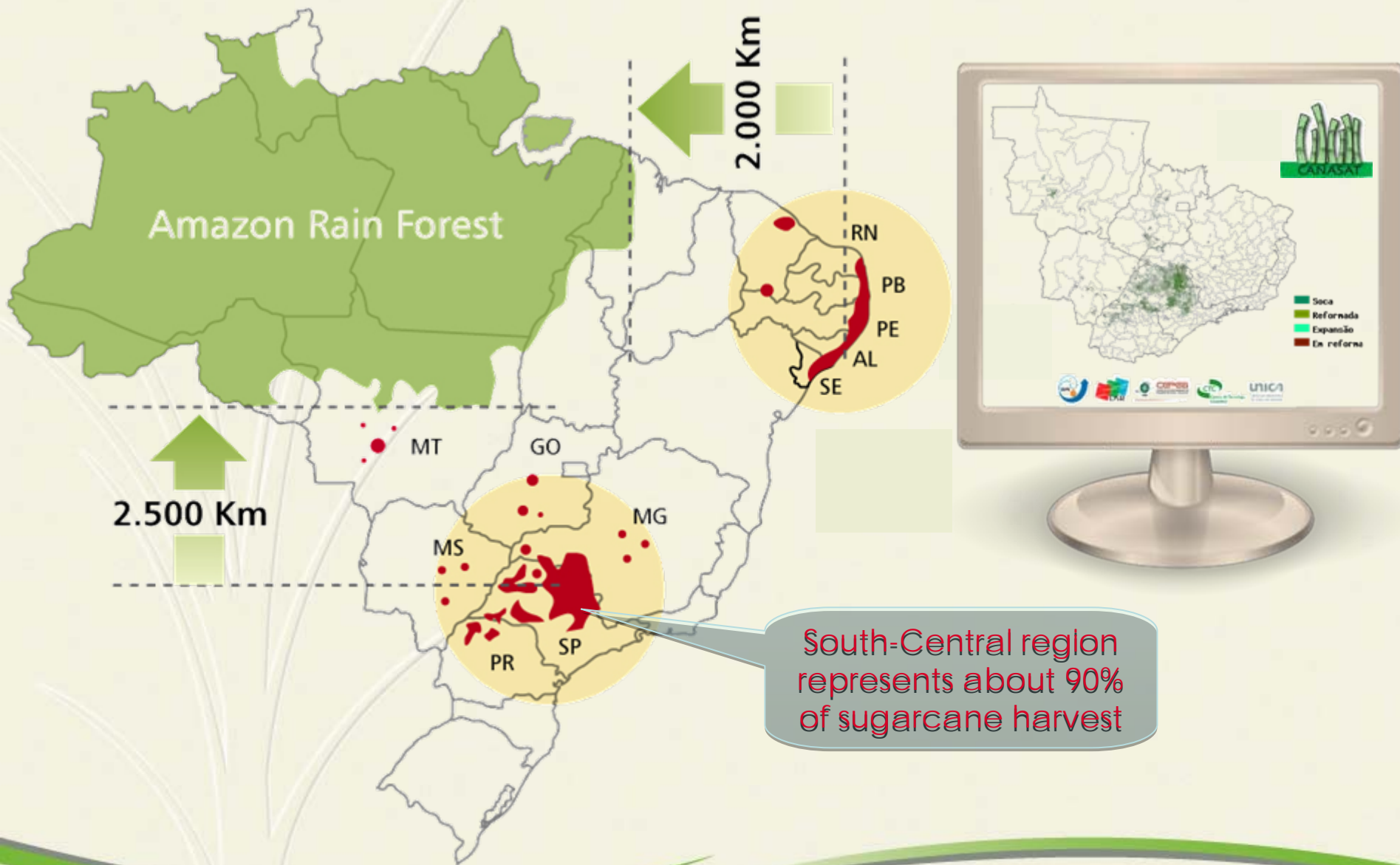
**ELECTRICITY**  
**16,000 GWh**

# PRODUCTS: WHAT WE'RE MAKING ALREADY



- Sugarcane is Brazil's **#1 source of renewable energy** and #2 overall energy source behind petroleum.
- **600 million tons of CO<sub>2</sub> emissions** avoided thanks to the use of ethanol since 1975.

# BRAZIL: WHERE SUGARCANE IS GROWN





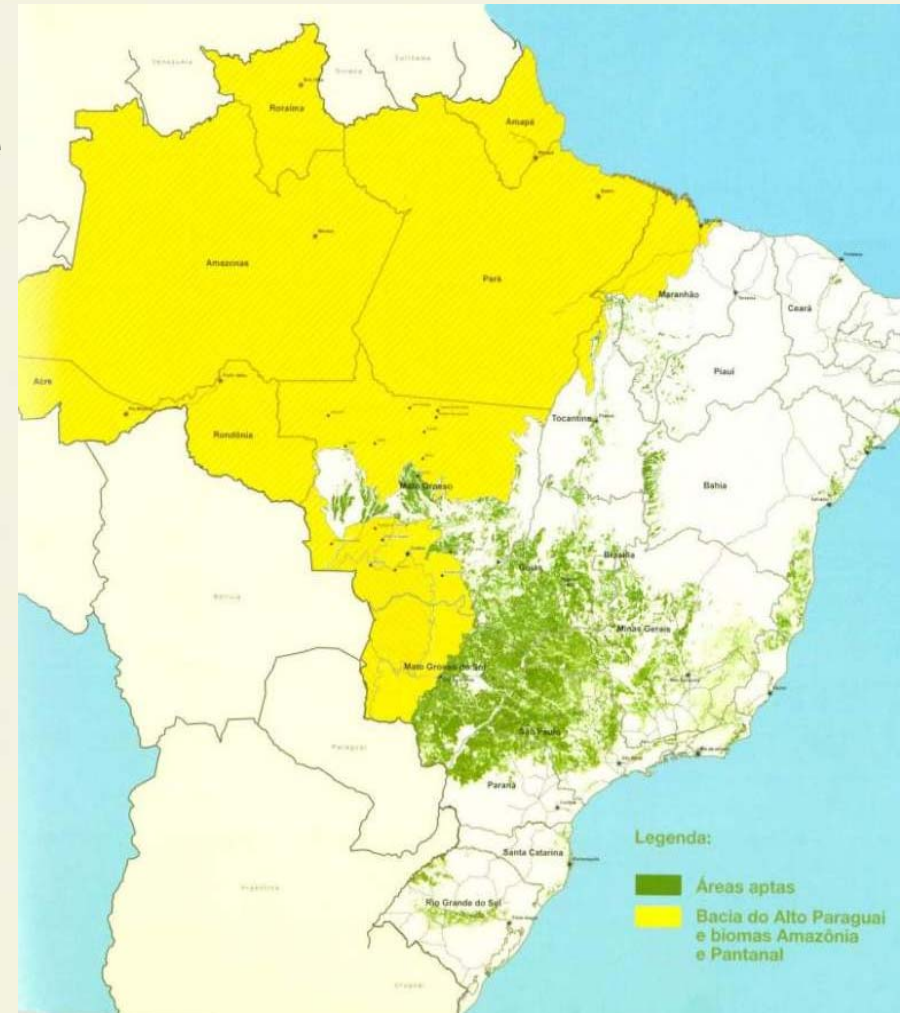
# BRAZIL: WHERE SUGARCANE CAN BE GROWN

At UNICA's urging, the Federal Government has implemented regulations that:

- Prohibit sugarcane plantation in **sensitive biomes** such as the Amazon forest and Pantanal wetlands.
- Prohibit sugarcane cultivation on **native vegetation** (e.g., cerrado, grasslands)

EMBRAPA undertook **satellite mapping** exercise and determined that identified **areas suitable for sugarcane production** based on environmental, economic and social criteria.

Result is that **sugarcane expansion is permissible on 65 million hectares** (160 million acres), which is equivalent to 7.5% of the Brazilian territory. Today less than 1% of Brazil's land is used for sugarcane.

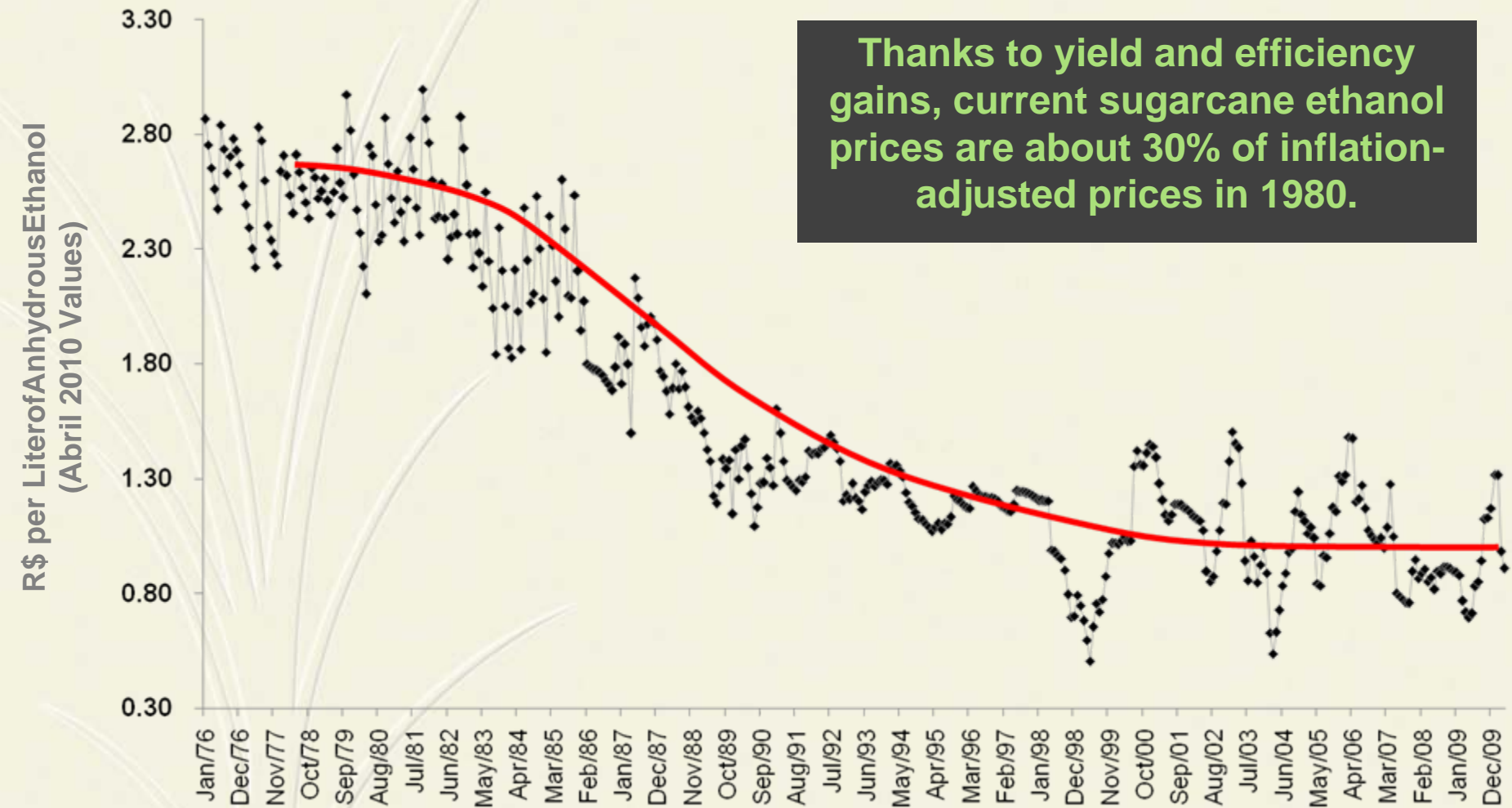


# LAND USE: OVER 50% OF GASOLINE WITH 1.5% OF LAND

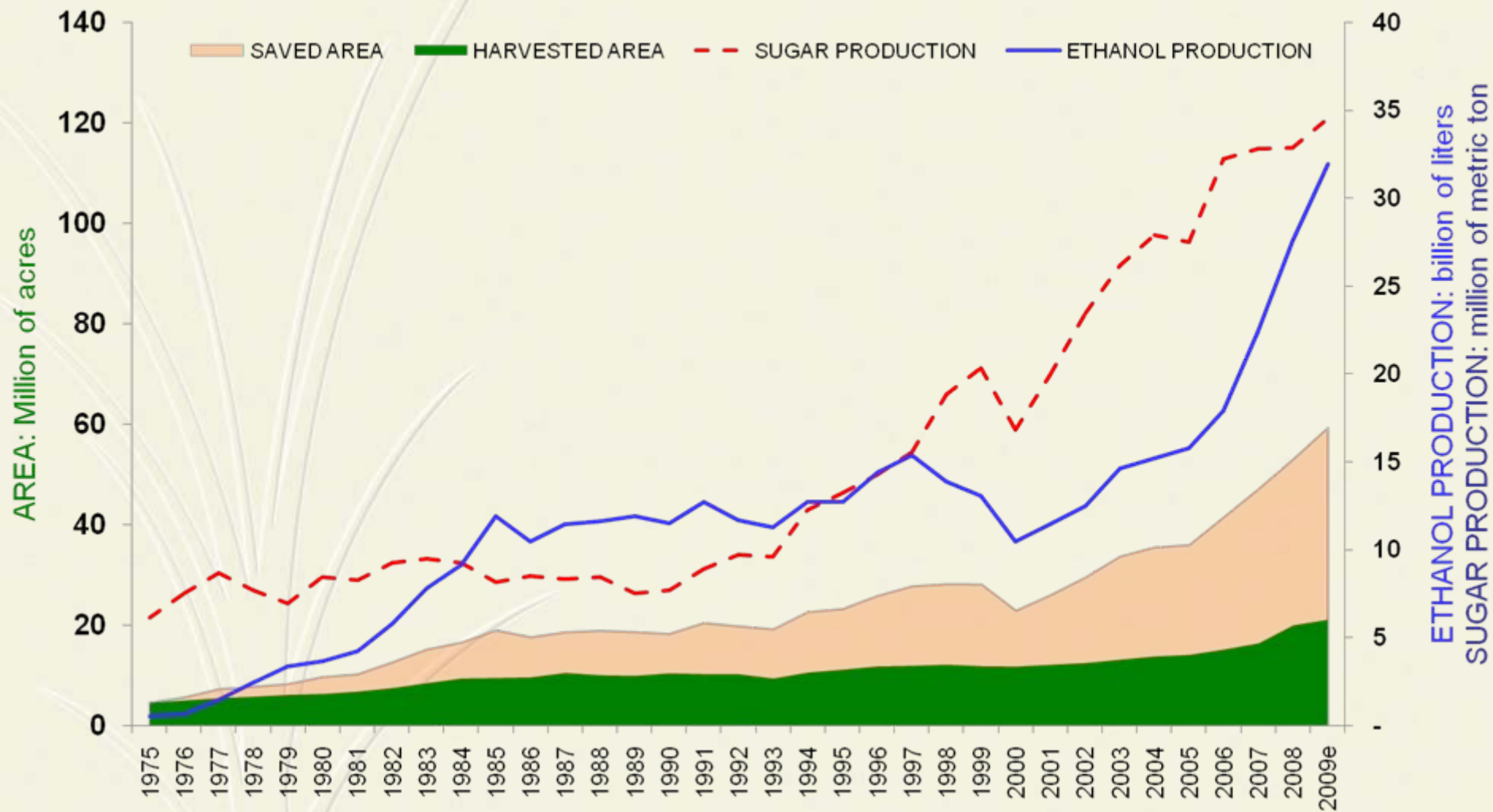
| Millions of hectares                                 |               | % of Brazil  | % of Arable Land |
|--|---------------|--------------|------------------|
| <b>BRAZIL</b>  | <b>851.48</b> |              |                  |
| <b>TOTAL ARABLE LAND</b>                             | <b>329.94</b> |              |                  |
| <b>1. Crop Land - Total</b>                          | <b>59.84</b>  | <b>7.0%</b>  | <b>18.1%</b>     |
| Soybean  | 21.57         | 2.5%         | 6.4%             |
| Corn   | 14.44         | 1.7%         | 4.4%             |
| <b>Sugarcane</b>                                     | <b>8.14</b>   | <b>0.9%</b>  | <b>2.5%</b>      |
| <b>Sugarcane for ethanol</b>                         | <b>4.88</b>   | <b>0.6%</b>  | <b>1.5%</b>      |
| <b>2. Pasture Land (~200 million head of cattle)</b> | <b>158.75</b> | <b>18.6%</b> | <b>48.1%</b>     |
| <b>3. Protected Areas and Native Vegetation</b>      | <b>495.61</b> | <b>58.2%</b> | <b>-</b>         |
| <b>4. Available Area</b>                             | <b>111.34</b> | <b>13.1%</b> | <b>33.7%</b>     |
| <b>5. Other Uses</b>                                 | <b>25.92</b>  | <b>3.0%</b>  | <b>-</b>         |

Note: Arable Land (Censo IBGE 2006) 1) Temporary and Permanent crop land (Censo IBGE 2006); Soybean, Corn and Sugarcane values (IBGE 2008) 2) Pasture land (Censo IBGE 2006) 3) Protected areas and native vegetation (GerdSpavorek 2009, not published yet) APP = Permanent Preservation Land; UC = Conservation Units and TI = Indigenous land 4) Area available = Arable Land – Crop Land – Pasture Land . Sources: ICONE and UNICA.

# YIELDS: CANE ETHANOL'S COST COMPETITIVENESS

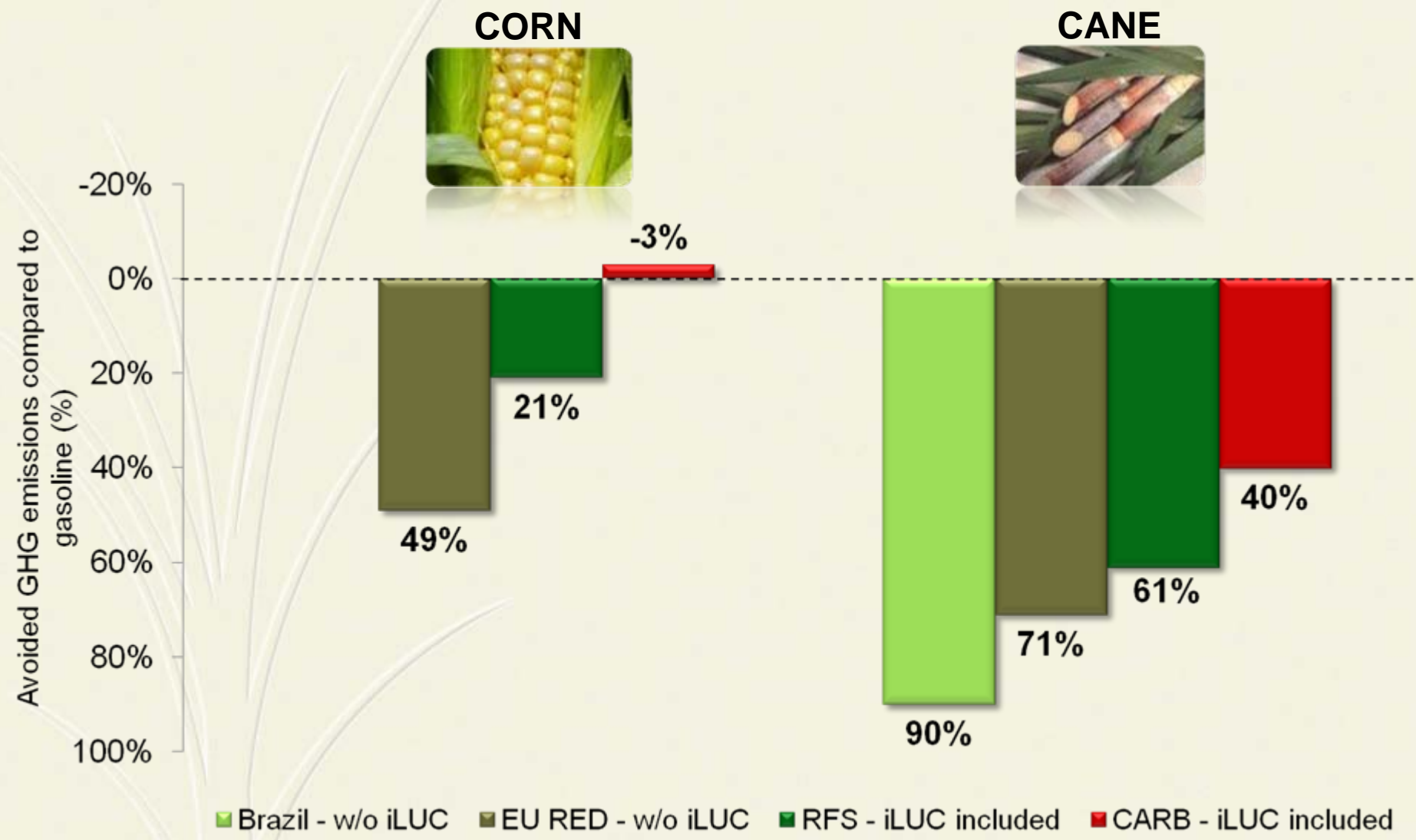


# YIELDS: SUGARCANE'S LAND EFFICIENCY



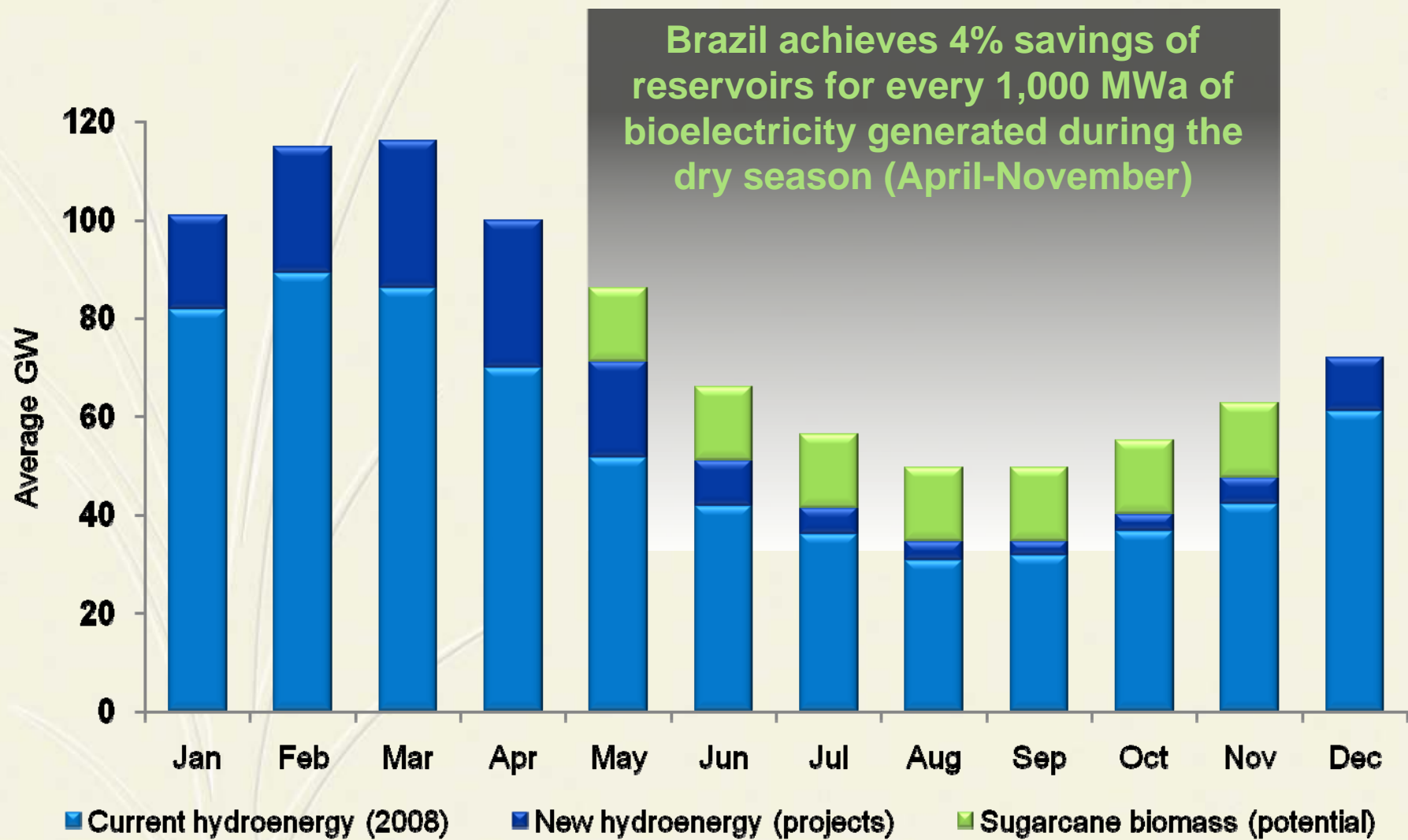


# SUSTAINABILITY: GHG REDUCTION IS JUST THE START

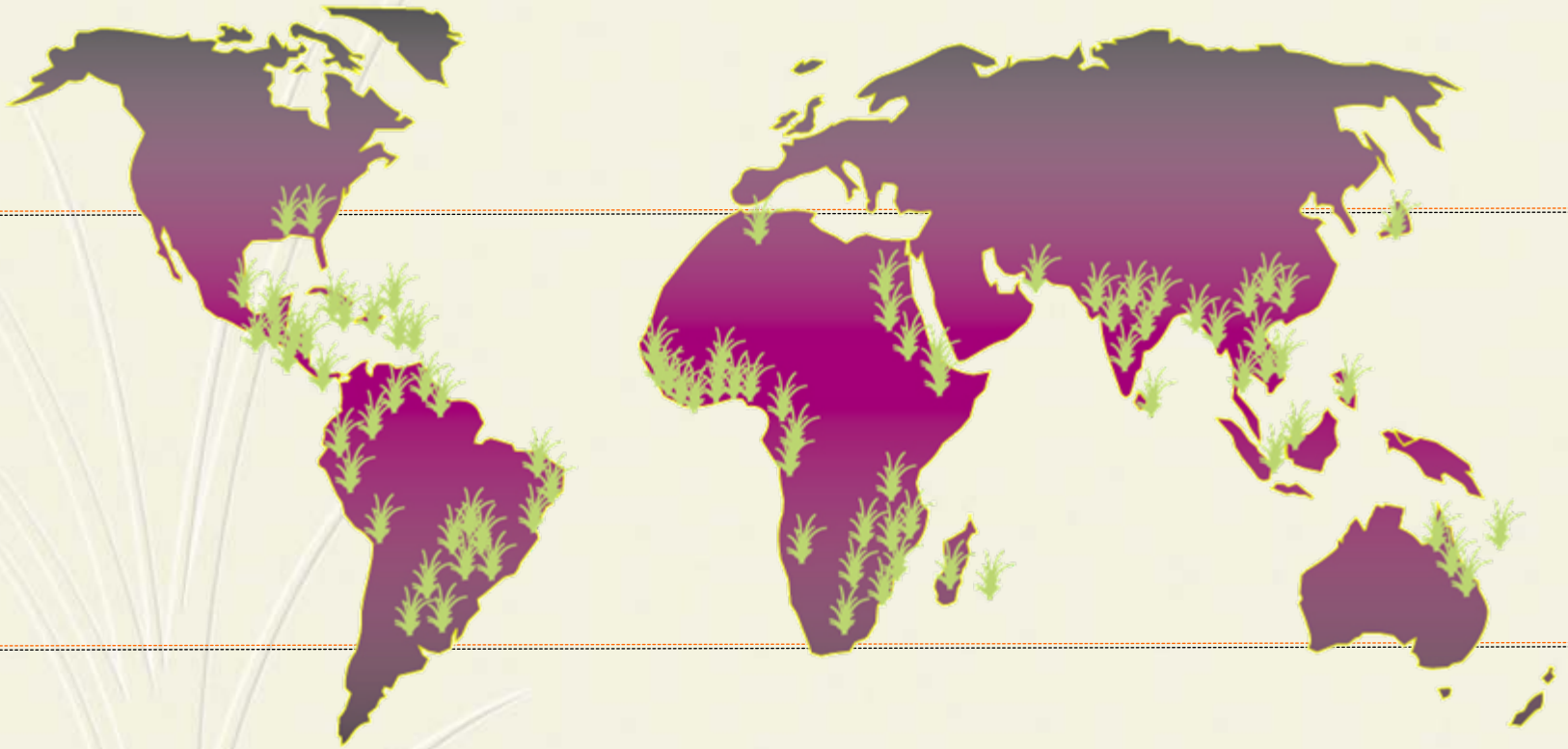


Sources: IsaiasMacedo&JoaqimSeabra (2008); RFS; CARB and European Directive

# ELECTRICITY: CANE COMPLEMENTS HYDROS IN BRAZIL



# WORLD: SUGARCANE IS NOT ONLY A BRAZIL STORY



**100 countries** could supply biofuels to 200 nations,  
while currently **20 oil producers** provide fossil fuels today.

# PRINCIPLES FOR VIABLE BIOFUELS VALUE CHAIN\*

1. **Feedstock Performance.** Sugarcane has been ideal, cost-effective feedstock in tropics. Geography, climate, and even politics should dictate feedstock choice. Performance, not policy, should drive the choice.
2. **Technology Neutrality.** It's not just about ethanol or even just biofuels. We're making bioelectricity, plastics and soon hydrocarbons.
3. **Sustainability.** We're committed to replacing fossil fuels with something better. Lower carbon fuels is just the start. The challenge for biofuels is to grow crops and market in a sustainable way.
4. **Open Competition.** If fossil fuels are freely traded around the world, why impose trade distorting barriers?



# CONCLUSION: CLEAN, AFFORDABLE YET RESTRICTED IN US



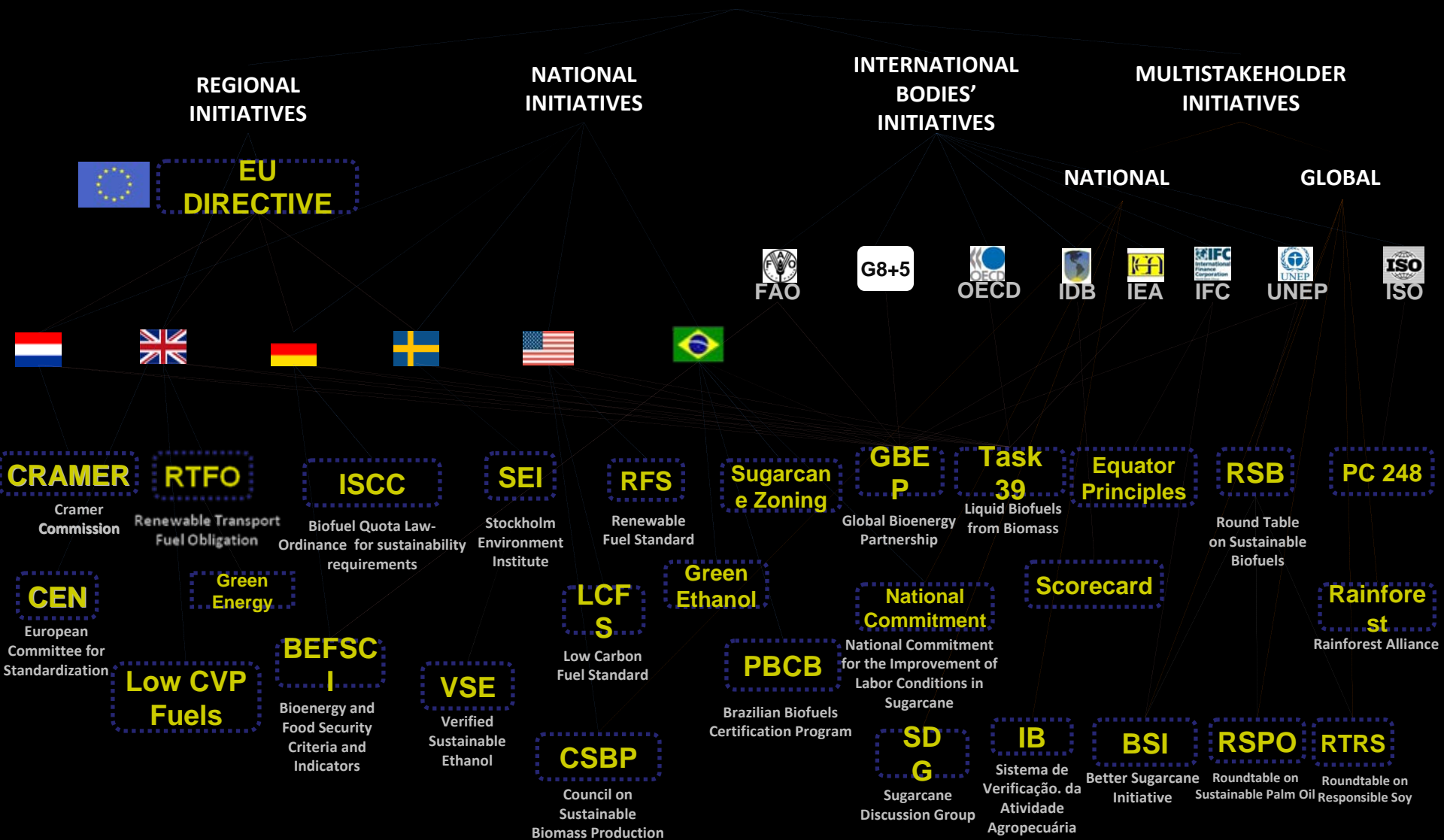


# Biofuels Sustainability Criteria

## *Implementation in Face of New Demands*

# SUSTAINABILITY INITIATIVES OR STAR WARS?

## SUSTAINABLE BIOFUELS





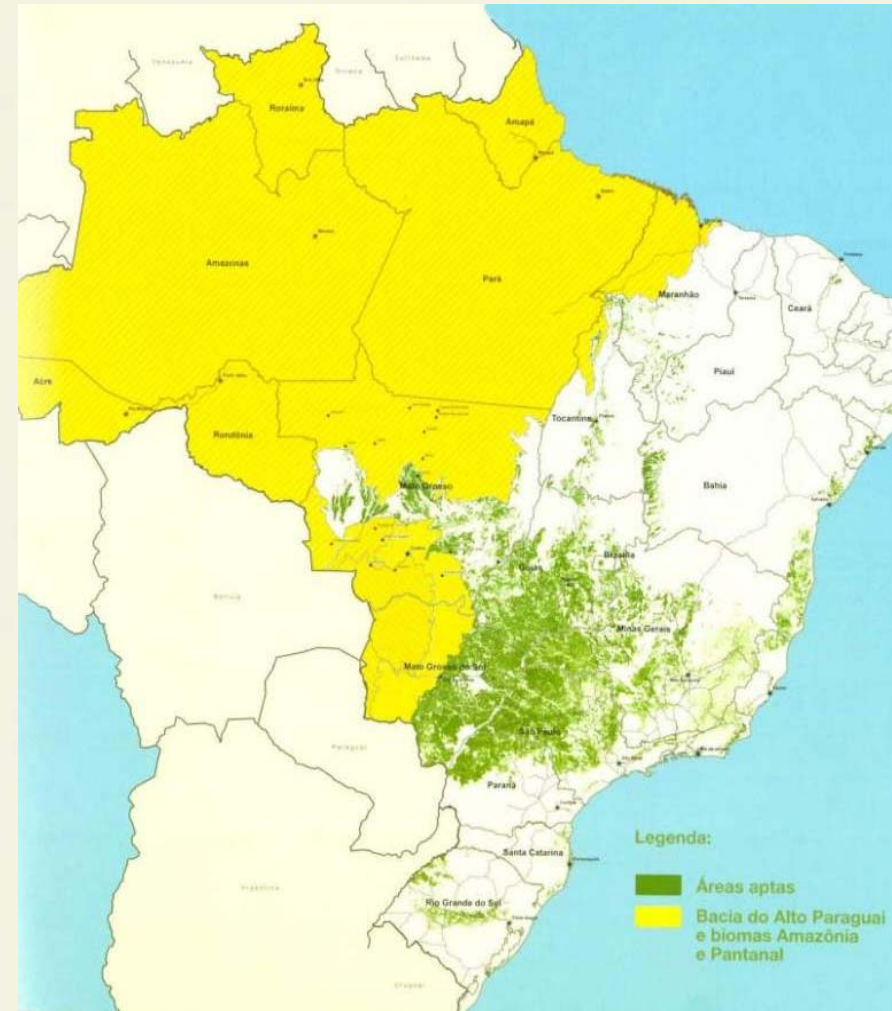
# SUGARCANE ZONING IN BRAZIL

The Federal Government has implemented regulations that:

- Prohibit sugarcane plantation in sensitive biomes such as the Amazon forest and Pantanal wetlands.
- Prohibit sugarcane cultivation on native vegetation (e.g., cerrado, grasslands)

EMBRAPA undertook **satellite mapping** exercise and determined that identified **areas suitable for sugarcane production** based on environmental, economic and social criteria.

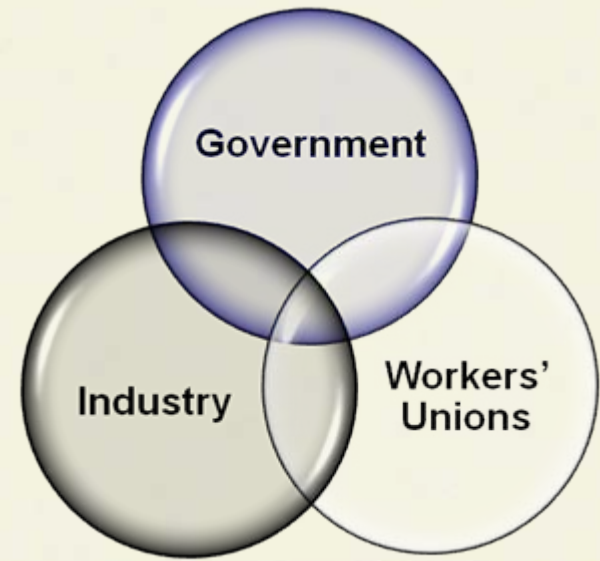
Result is that **sugarcane expansion is permissible on 65 million hectares** (160 million acres), which is equivalent to 7.5% of the Brazilian territory. Today less than 1% of Brazil's land is used for sugarcane.





# NATIONAL COMMITMENT FOR BETTER WORK CONDITIONS

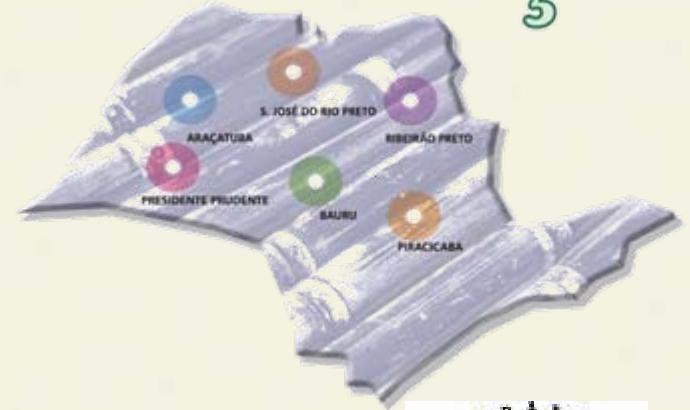
- A multi-party national commitment negotiated between workers' unions, sugarcane industry and the federal government
- Participation is voluntary yet over 80% of all mills in Brazil are already participating
- Focus on continuous improvement, establishing better labor practices – about 30 exemplary business practices that go beyond legal obligations



# REQUALIFICATION FOR SUGARCANE RURAL WORKERS

- ❖ Recognizing the impact of the mechanization of the sugarcane harvest on rural laborers, UNICA and the workers' union (FERAESP) joined forces to provide training and re-qualification for 7,000 current and former cane cutters per year.
- ❖ UNICA and FERAESP coordinate the effort with support from various companies (Syngenta, John Deere and Case) as well as a grant from the Inter-American Development Bank (IADB).
- ❖ Examples of requalification courses include: truck driving, mechanic, harvester operator, electrician, cooking, horticulture, tailor, and literacy.

## renovAção



unica



unica

# UNICA SUSTAINABILITY REPORTING

Source: UNICA's GRI Report (2008). Prepared according to the Global Reporting Initiative (GRI) framework, one of the world's most credible and widely used.

# UNICA SUSTAINABILITY TAKEAWAYS

## Challenges for the Implementation of Social Sustainability Criteria:

- ❖ Multiplication of initiatives is counterproductive
- ❖ Language/regulatory barrier (e.g., EPA)
- ❖ Hardest challenge is not to be compliant, but to *prove* compliance

## Recommendations:

- ❖ Create tools for stimulating continuous improvement, not just threshold
- ❖ Governance needs to be well structured and transparent
- ❖ There are different criteria for different “targets”:
  - Industries (Better Sugarcane Initiative, Roundtable of Sustainable Biofuels, etc)
  - Policy-makers (GBEP)
  - Financial institutions (IDB’s Scorecard, Equator Principles)
- ❖ Do not “reinvent the wheel.”
  - Avoid duplication of efforts by recognizing other initiatives, projects, self regulations and existent requirements of national legislation (it reduces costs, uncertainty and increases the “attractiveness” of the initiative).

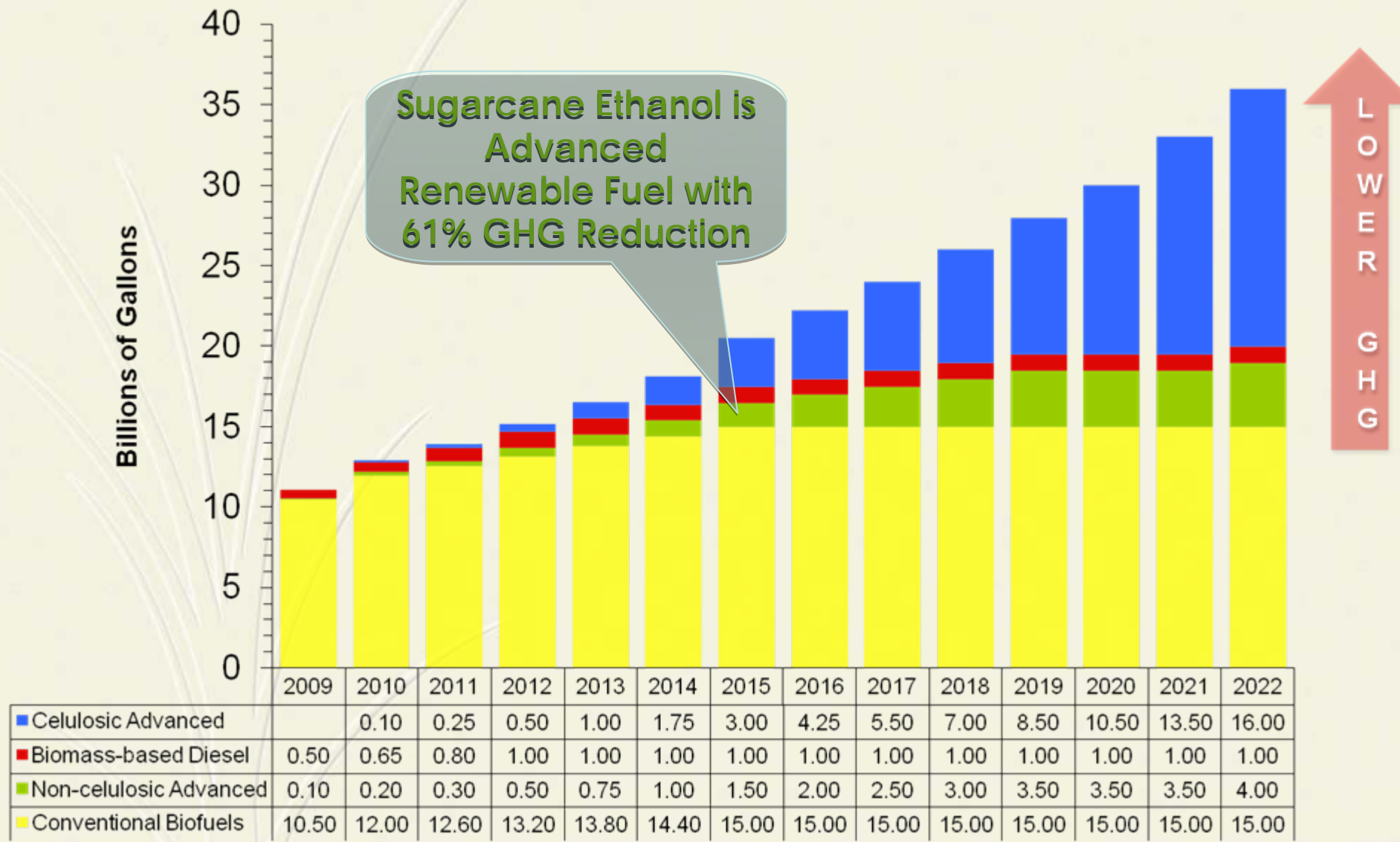


The background of the slide is a close-up, slightly blurred image of several green sugarcane stalks, showing their characteristic ribbed texture and vertical orientation.

# Sugarcane's Advanced Biofuels

## *Cane Ethanol in the RFS and the LCFS*

# U.S. RENEWABLE FUELS STANDARD (RFS-2)



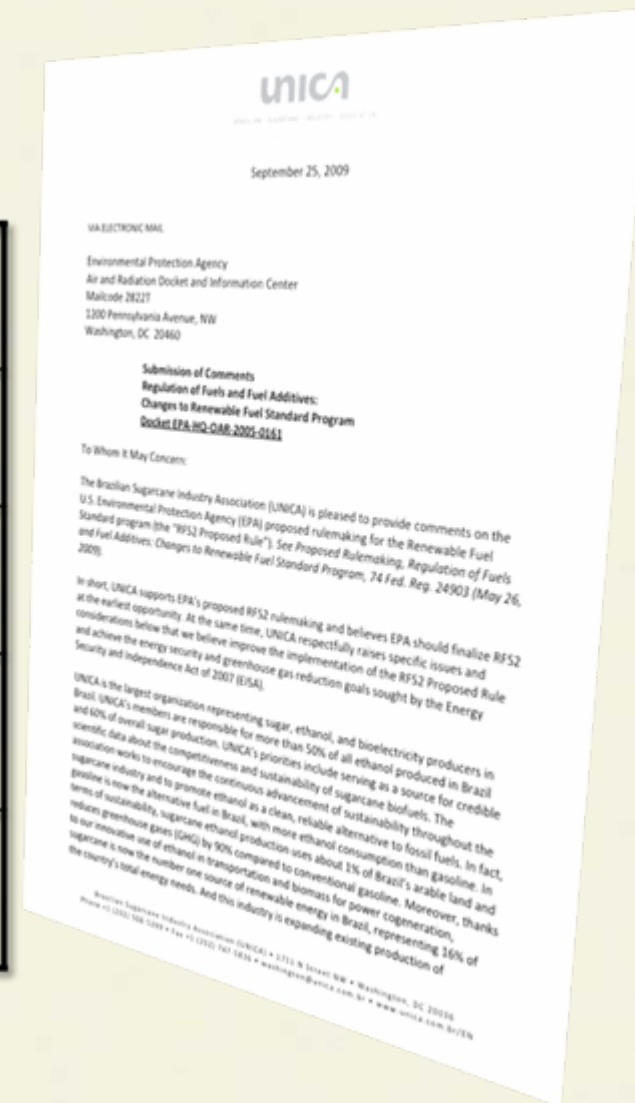
Source: EISA of 2008, U.S. Environmental Protection Agency (RFS-2) Final Rule.



# WHAT UNICA TOLD EPA...

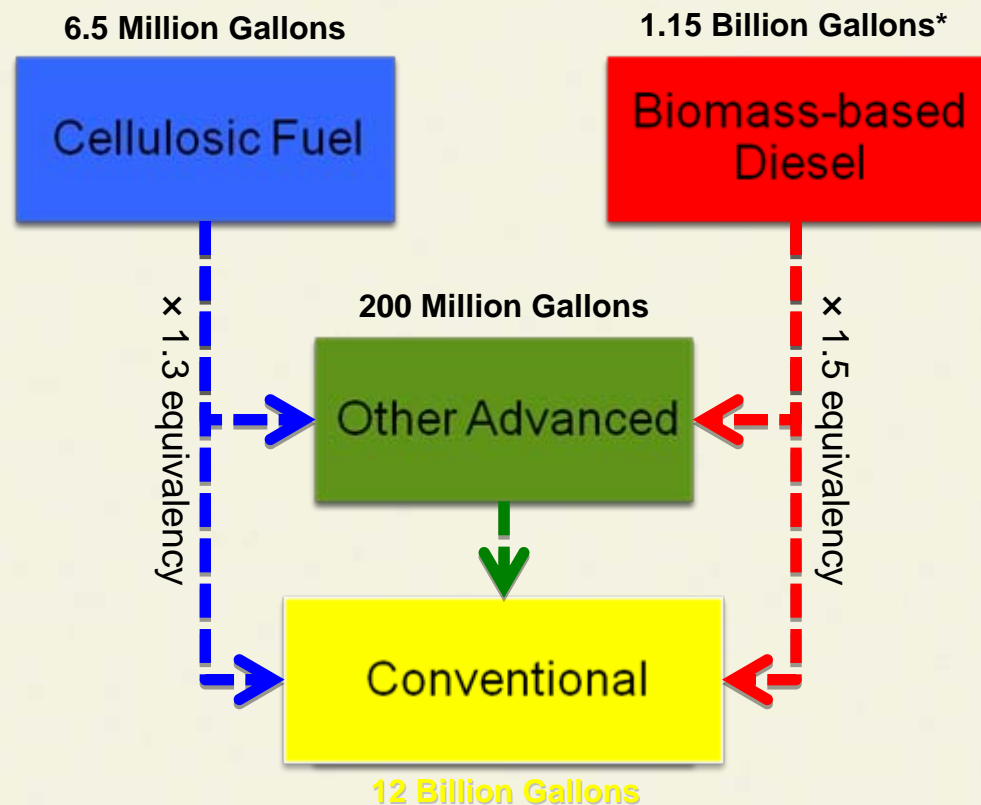
While we were pleased with results of EPA's rulemaking, we believe that GHG reduction – even *including ILUC* – is still better than 61%...

|   | 100 years<br>2% Discount | 30 years<br>0% Discount |
|---|--------------------------|-------------------------|
| EPA Proposed Rule                       | -44%                     | -26%                    |
| Brazilian Regional<br>Land Use Modeling | -64%                     | -52%                    |
| Recognizing Carbon<br>Uptake of 17tC/ha | -69%                     | -60%                    |
| Emission Credits for<br>Cogeneration    | -82%                     | -73%                    |



# RFS-2 IN 2010 UNLIKELY TO DRIVE CANE ETHANOL IMPORTS

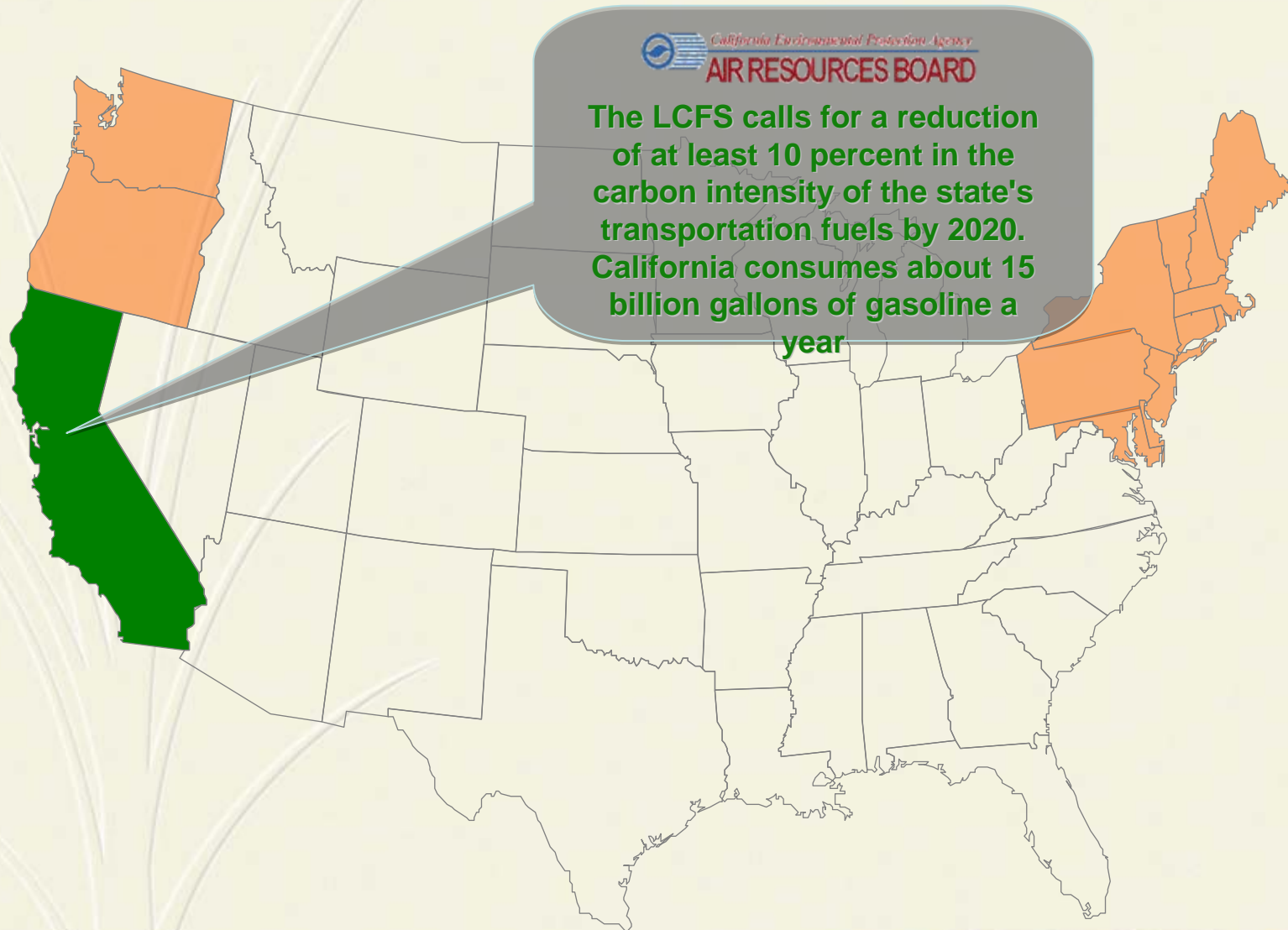
- EPA's accounting of RFS obligation **compliance is through Renewable Identification Numbers (RIN)**, which accounts for energy density. RINs are like serial numbers for fuels but accounting is highly complex.
- The RFS is a **nested mandate** and RINs for Cellulosic and Biodiesel can displace "other advanced" as well as conventional, namely sugarcane and corn ethanol.
- In 2010, **biodiesel RINs may likely "flood" the Advanced pool**, undermining demand for sugarcane ethanol to meet the "other advanced" requirement.



NOTE: EPA combined the 2010 biomass-based diesel requirement of 0.65 billion gallons with the 2009 biomass-based diesel requirement of 0.5 billion gallons to require that obligated parties meet a combined 2009/2010 requirement of 1.15 billion gallons by the end of the 2010 compliance year.

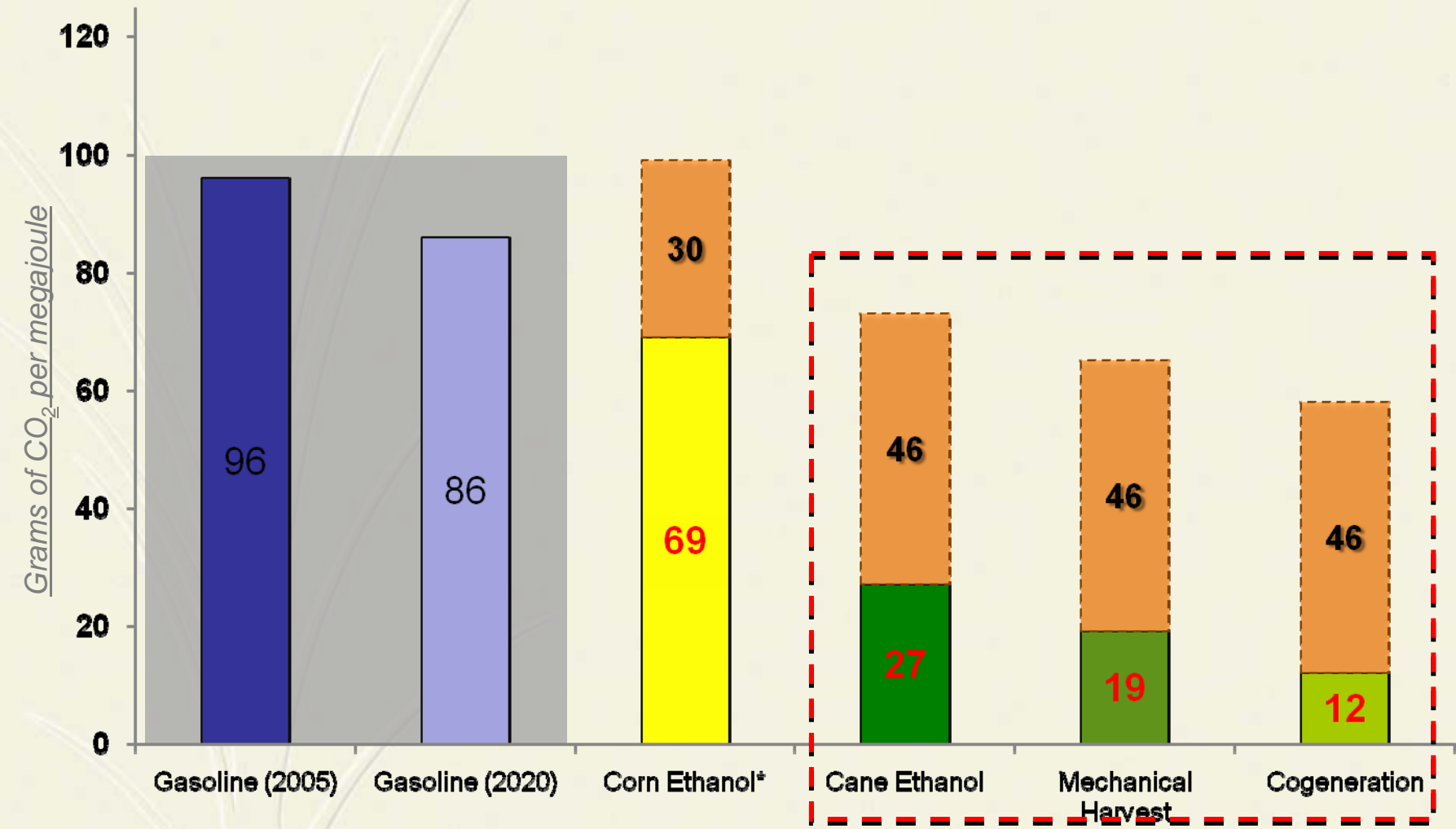


# CALIFORNIA'S LOW CARBON FUEL STANDARD



# LCFS WITH INDIRECT LAND USE PENALTY

*Despite Modeling Errors, Sugarcane Ethanol is Lowest Carbon Liquid Fuel*

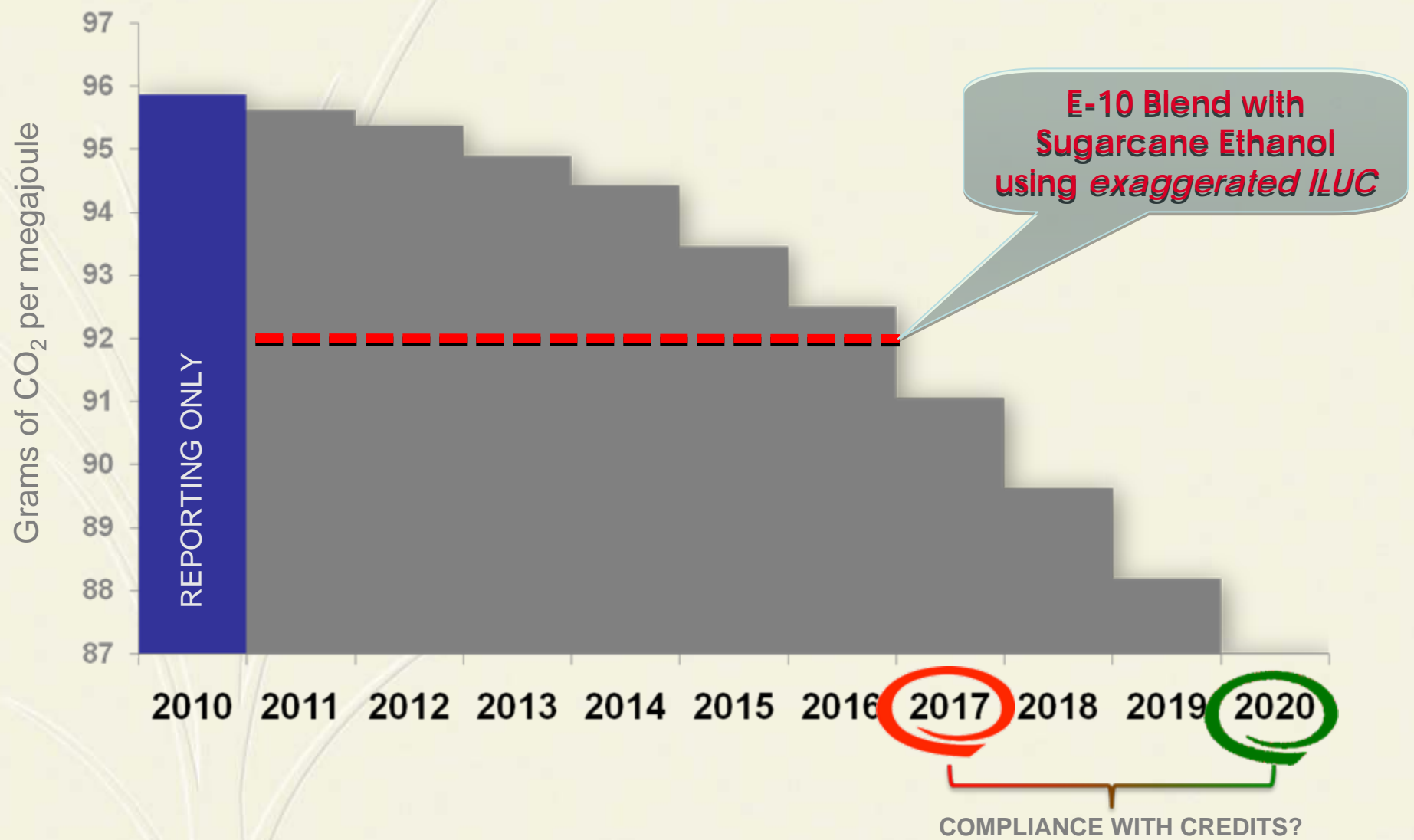


Fonte: California Air Resources Board's Low Carbon Fuel Standard.



# LCFS SIMULATION WITH SUGARCANE ETHANOL

*Even with ILUC, 10% sugarcane ethanol blends meet LCFS to 2017*



Source: California Air Resources Board's Low Carbon Fuel Standard, August 2009.