Ethanol Market Overview

ExCo67 – Helsinki – Finland
Tuesday, May 10th, 2011

Mark Thomas Lyra
Business Development Director

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raízen at a Glance

Shell's Motivation

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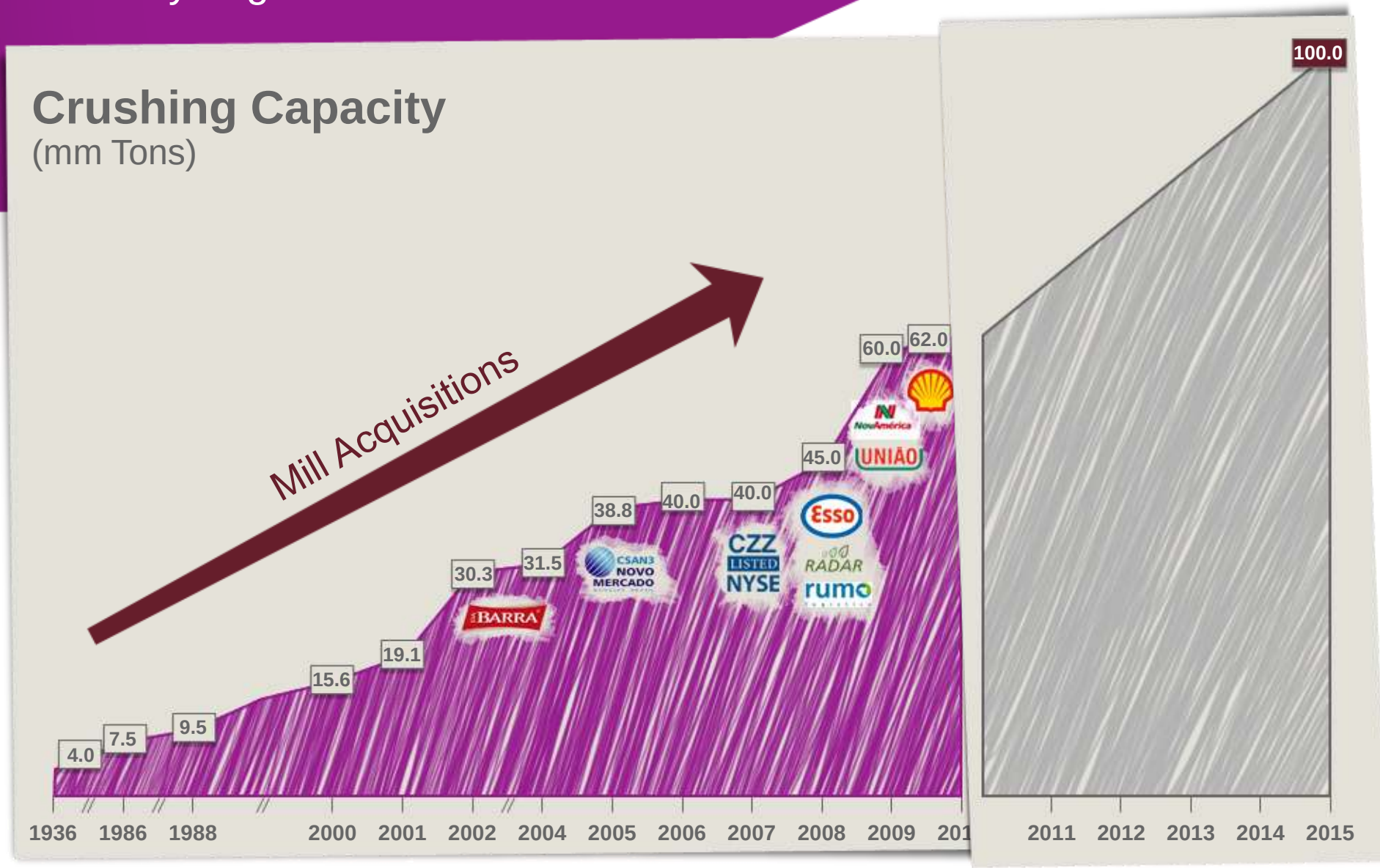
Raízen Overview

A history of growth and innovation

Crushing Capacity
(mm Tons)



[1]Current total crushing capacity

Esso started operations in Brazil in 1912
Shell started operations in 1914

- **3600** fuel stations
- **53** Logistical Terminals
- **19,000,000m³**/ Year

Today Raízen is **among the top players** in fuel distribution

Raízen Overview

Raízen mills enjoy locations with logistical advantages

Favorable Geographic Position

Efficient Logistics

State of São Paulo

The São Paulo State is responsible for:

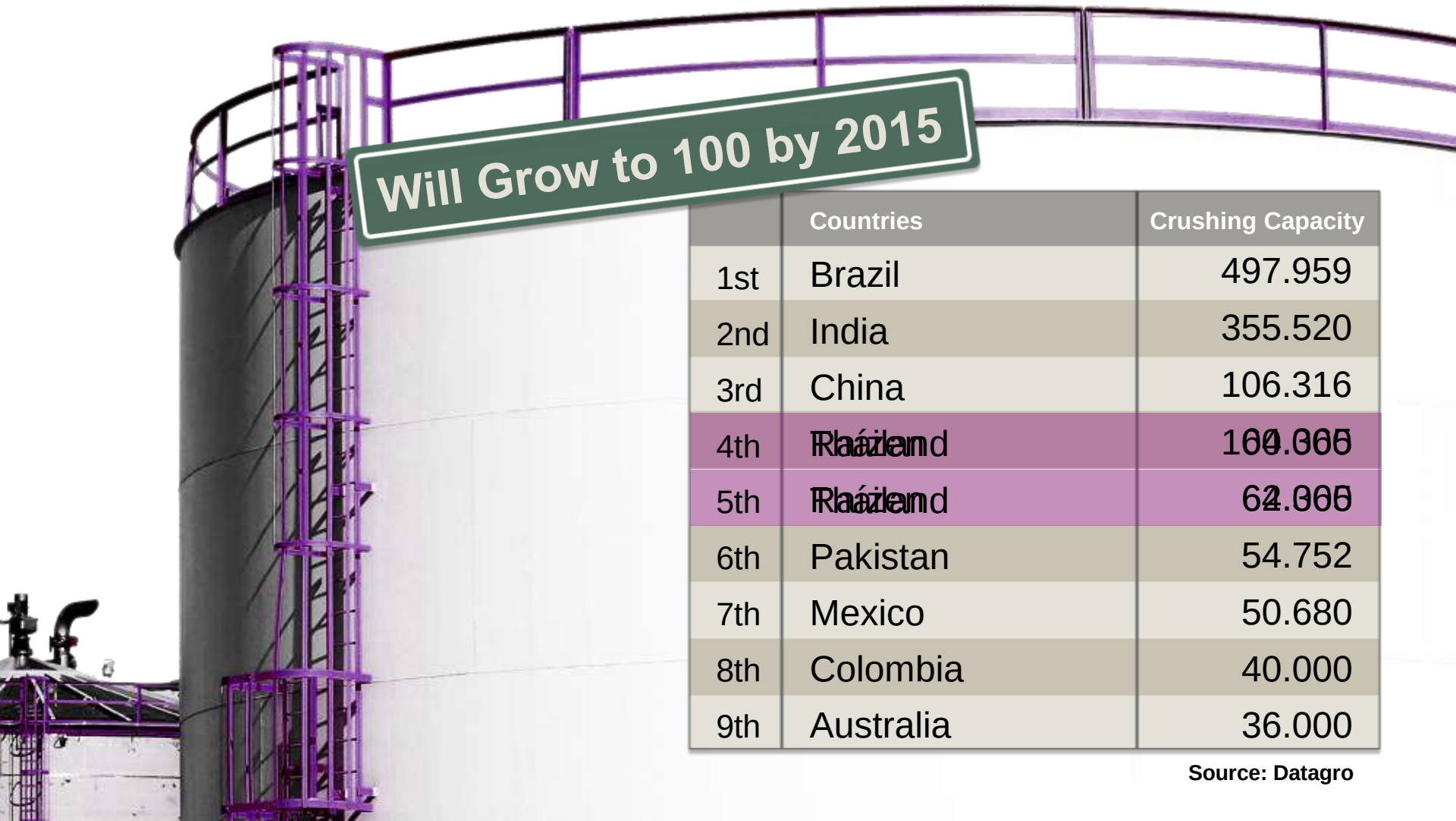
- 74% of the Brazilian sugar production
- 67% of the Brazilian ethanol production
- 69% of the total sugar cane crushed in Brazil

The São Paulo State consumes:

- 68% of all ethanol produced in the country
- 50% of all sugar produced in the country

Note: Data as of 2008/09 harvest.
Source: UNICA and newspapers.

Raízen's total crushing capacity would rank it among the top producing countries in the world



	Countries	Crushing Capacity
1st	Brazil	497.959
2nd	India	355.520
3rd	China	106.316
4th	Raízen	100.000
5th	Raízen	64.000
6th	Pakistan	54.752
7th	Mexico	50.680
8th	Colombia	40.000
9th	Australia	36.000

Source: Datagro

Large scale sugar cane cultivation results in lower costs

Will Grow to 1.200.000 by 2015

Sugar cane area managed by Raízen is about **700.000 hectares**

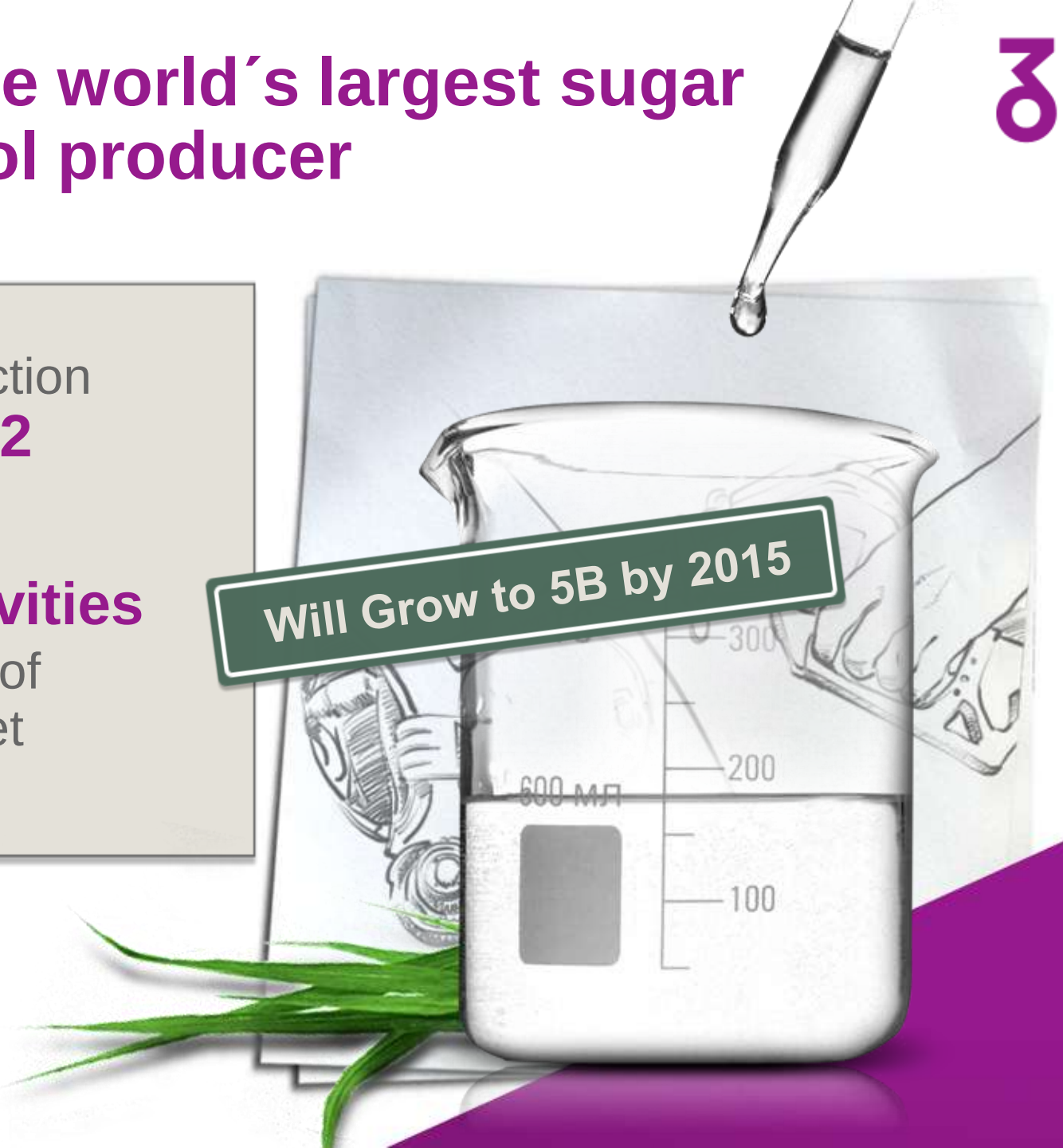
This area is Equivalent to **730.000 Maracanã Stadiums**

Raízen is committed to improving efficiency in this area

72% of the 2011/2012 Crop will be **harvested mechanically**

Raízen is the world´s largest sugar cane ethanol producer

- 2011/12 production estimated at **2.2 Billion liters**
- **Trading activities** covering **30%** of Brazilian Market



Raízen also owns an ethanol terminal in Santos

Will Grow to 80.000m3 by 2013

- Cosan has **66% stake**
- **40.000 m3** static capacity (4 tanks of 5.000 and 2 tanks of 10.000 m3)

Raízen is Brazil's largest Sugar Producer and is able to Supply half of US Yearly Consumption

Will Grow to 6 million tons by 2015

4.3 million
Tons of Sugar

Raízen co-generation capacity is enough to supply a city like Rio de Janeiro

Will Grow to 900 MW by 2015

Total electricity co-generation for export 2011

- **300 MW** – enough to support a city of 900K people
- At conclusion of installed projects = **600 MW**
- Equivalent to the **consumption** of a city like **Rio de Janeiro**

Social Responsibility

- Raízen has over **40.000 employees**
- In 2010, the Cosan Foundation benefited **over 60.000 members of the communities** in which it operates

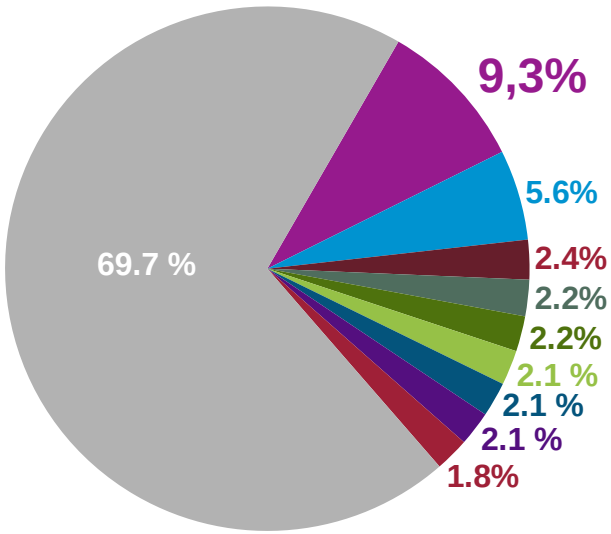
Leading market position

Superior scale in a highly fragmented industry

Brazilian market share

mm ton

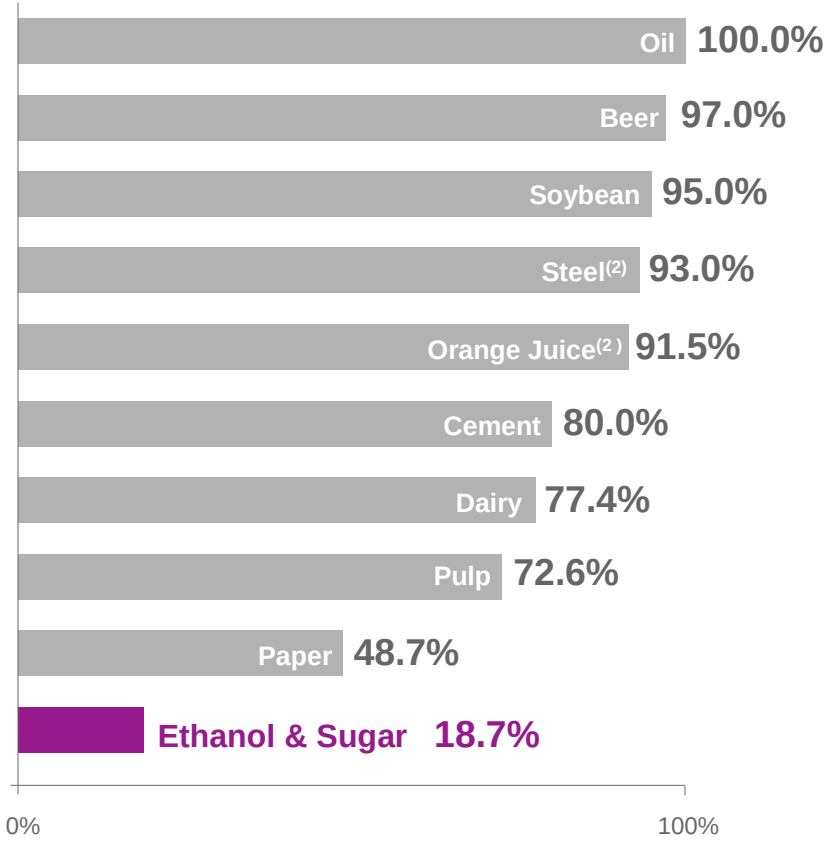
Sugarcane crushed in 2008/2009



- raízen
- Louis Dreyfus + Santelisa Vale
- Guarani
- Moema
- Usaçúcar
- Alto Alegre
- Carlos Lyra
- São Martinho
- Tércio Wanderley
- Others

Consolidation is Related sectors in Brazil

Market Share of Top 5 Companies (1)



1) Note: Beer. steel data as of 2005; orange juice as of 2004; cement. dairy. pulp and. paper as of 2003; soybean as of 2000
2) Percentage based on the four top players in the sector

Raízen is the First Fully Integrated Player in the Sugar Cane Industry

Sugar cultivation

Sugar and Ethanol Production

Sugar and Ethanol Trading

Domestic and Export Logistics

Retail and Distribution

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raízen at a Glance

Shell's Motivation

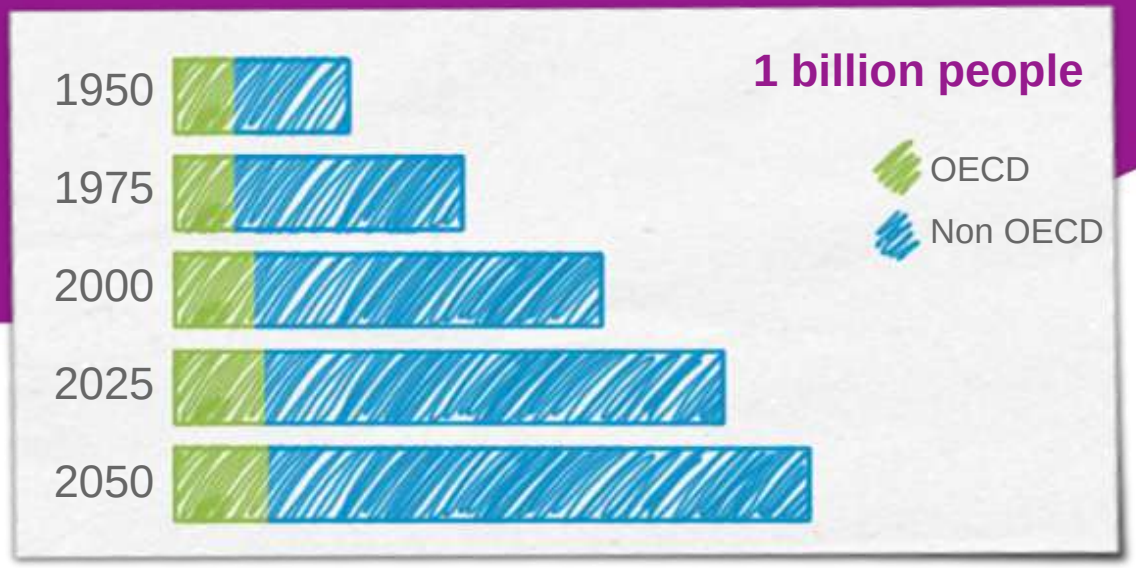
Ethanol Market Overview

Sustainable Growth

By 2050 there will be over 9 billion people and most of this population growth will come from developing nations

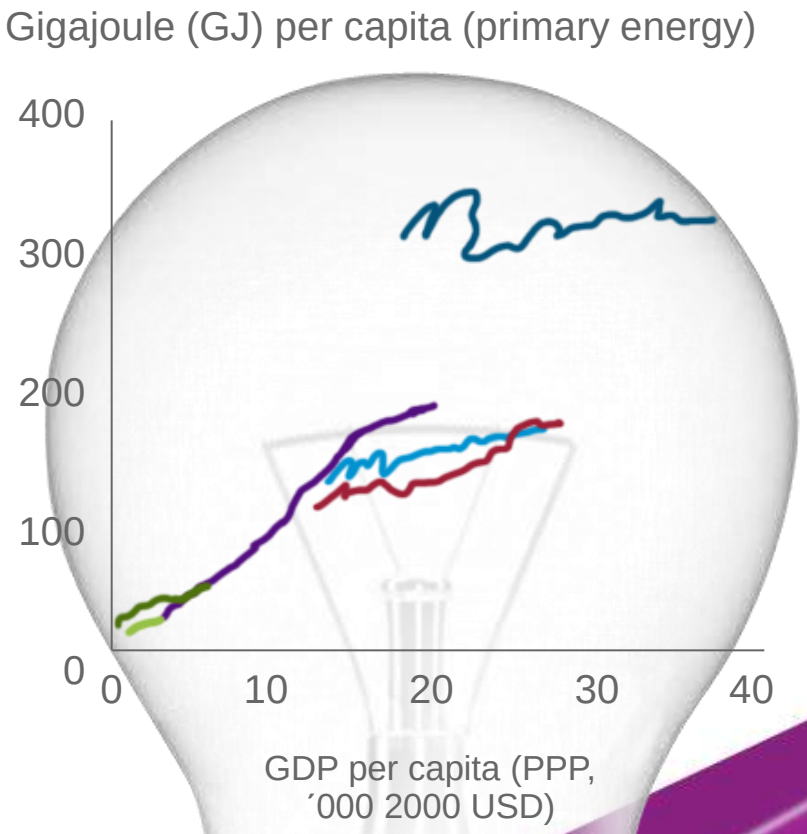
- **Global population** has increased more than **100%** since 1950
- Population **will increase** more than **40% by 2050**

Fonte: World Bank WDI (2008)



Energy Consumption

Developing countries are expected to consumer more energy per capita



Energy consumption increases with **economic growth**

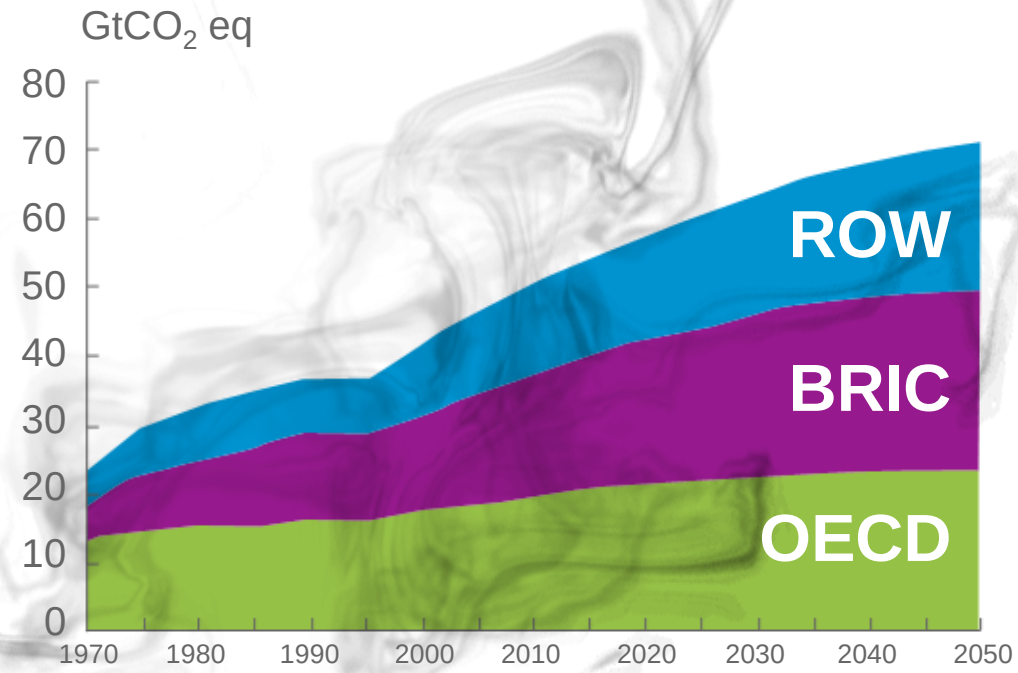
- USA
- Europe EU 15
- Japan
- South Korea
- China
- India

Fonte: OECD Energy Balances (2006)

Greenhouse Gas Emissions

The use of fossil fuels is directly linked to the emission of greenhouse gases

A. OECD Enviromental Outlook Baseline

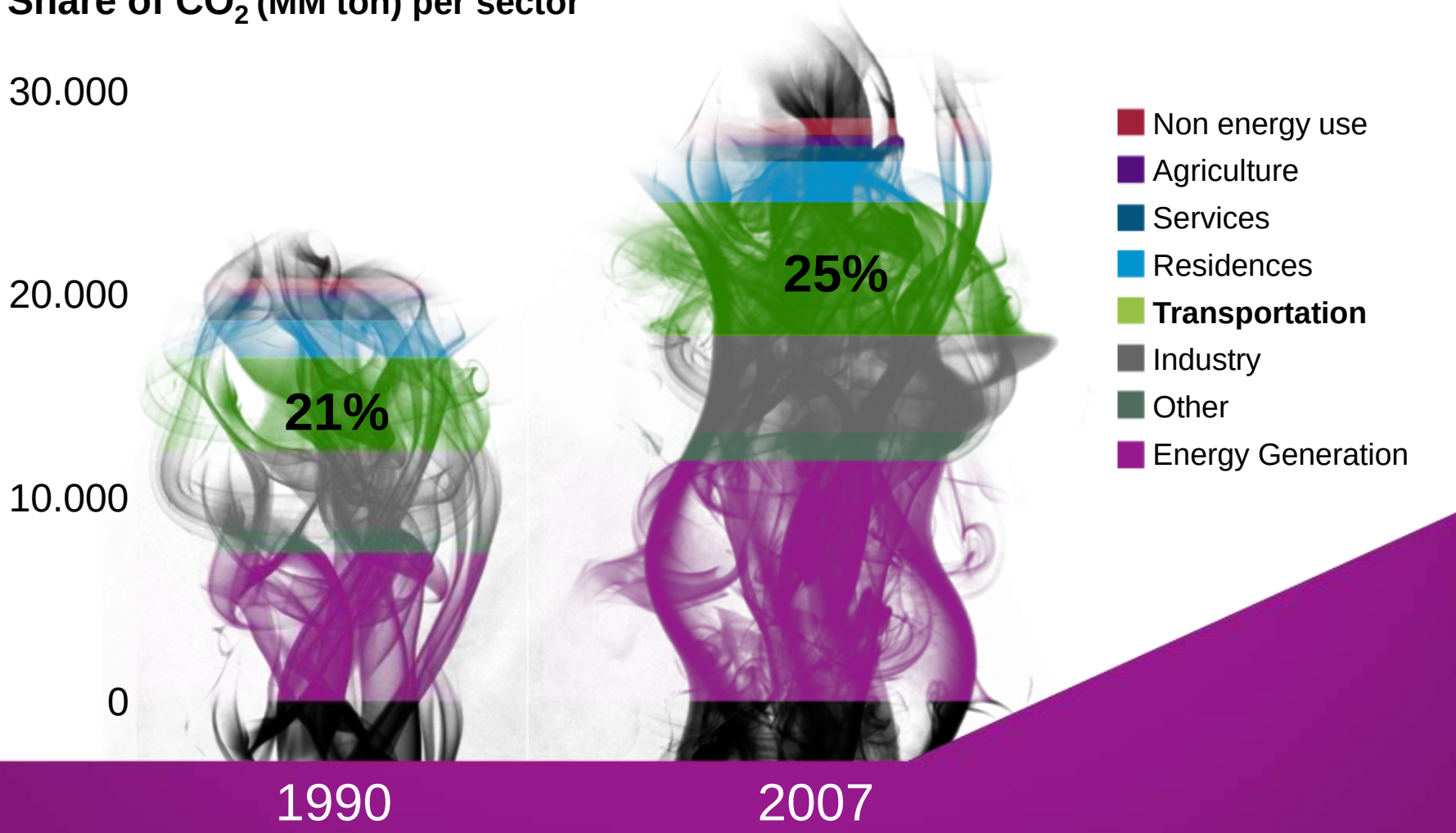


Fonte: OECD (2008)

Greenhouse Gas Emissions

The transportation sector is responsible for a significant portion

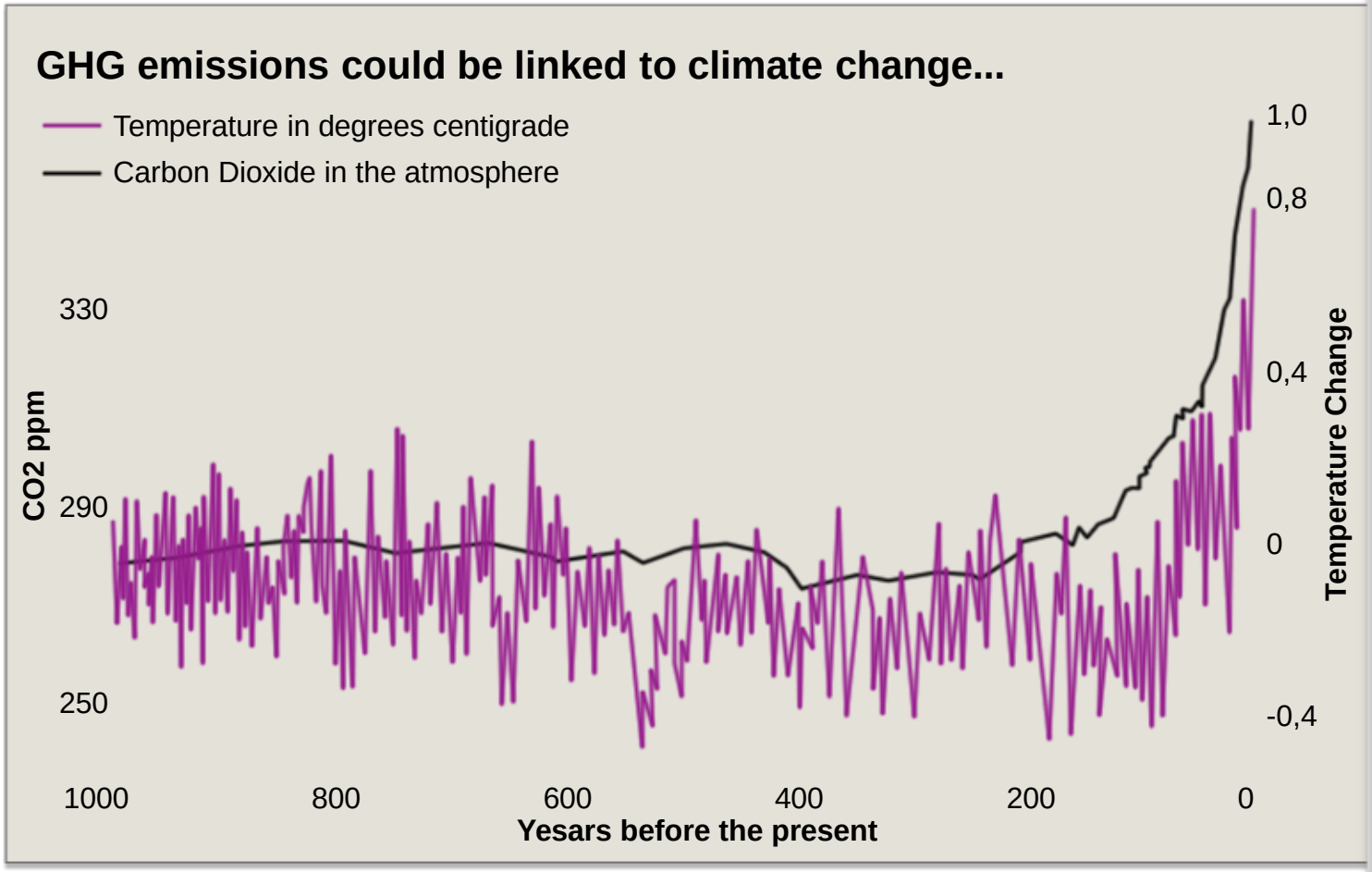
Share of CO_2 (MM ton) per sector



Source: EIA (2009)

Emissions and Climate Change

Business as Usual attitude could result in a significant increase in GHG emissions



Source: IPCC (2007)

Climate Change Consequences

Scientific projections point at severe consequences

Climate Change Projections

Global Temperature Change in relation to pre industrial times

0ºC 1ºC 2ºC 3ºC 4ºC 5ºC 6ºC

Food

Agricultural Production Shortfalls

Water

Disappearing glaciers and restricted water supply in some areas

Rising sea levels

Eco-System

Large damage to sea coral reefs

Large number of species at risk of extinction

Extreme Weather

Storms, fires, draught, floods, heat waves

Risk of abrupt and irreversible change

Growing risk of abrupt change in climate patterns and cycles

Source: Stern Review

Society's Concern

Society has a growing concern with this issue

Is Global Warming a Serios Problem?

Brazil	90
Argentina	69
S. Korea	68
France	68
India	67
Mexico	65
Japan	65
Turkey	65
Spain	61
Germany	60
Palest. Ter.	59
Nigeria	57
Jordan	54
Egypt	54
Lebanon	53
Pakistan	50
Britain	50
Kenya	48
Israel	48
Canada	47
Indonesia	46
Russia	44
U.S.	44
Poland	36
China	30

Government and Corporate Attitude

Governments and Corporations seek cleaner alternatives

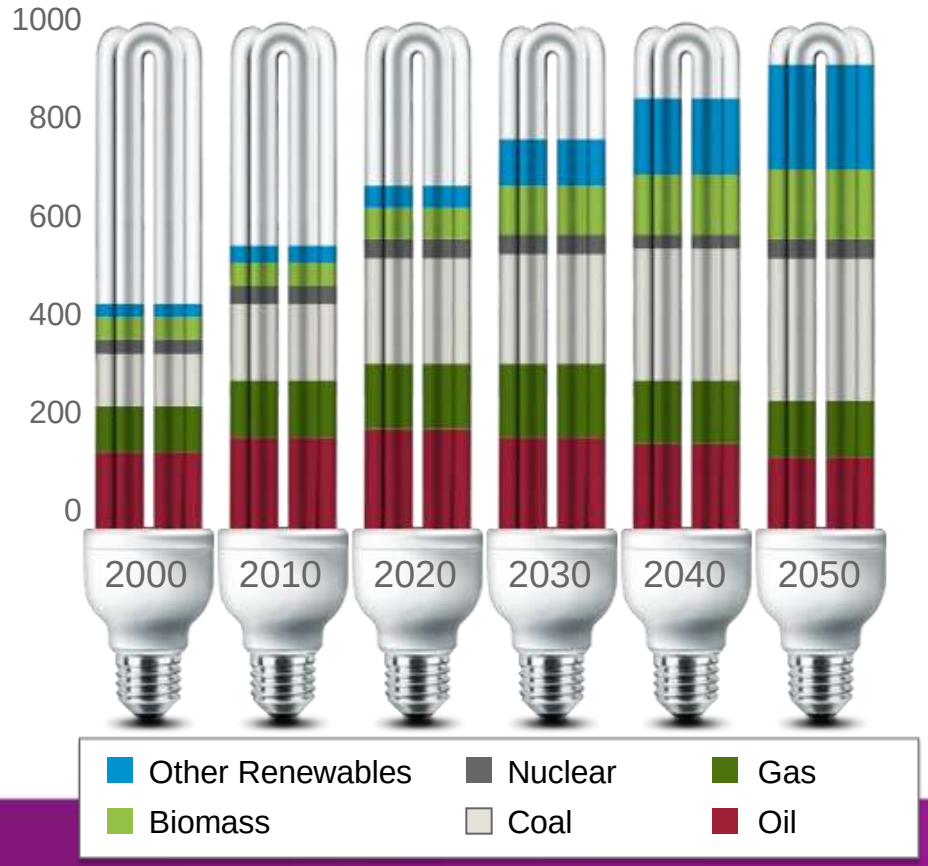
- **Kyoto Protocol** (Annex I countries): 5,2% emission reduction by 2012 in relation to 1990 levels
- **European Union:** 20% emission reduction by 2020 in relation to 1990 levels
- **China:** 40-45% emission reduction by 2020 in relation to 2005 levels
- **California:** 10% emission reduction by 2020 in relation to 2005 levels
- **Brazil:** 36-39% emission reduction by 2020

Biofuels as Part of the Solution

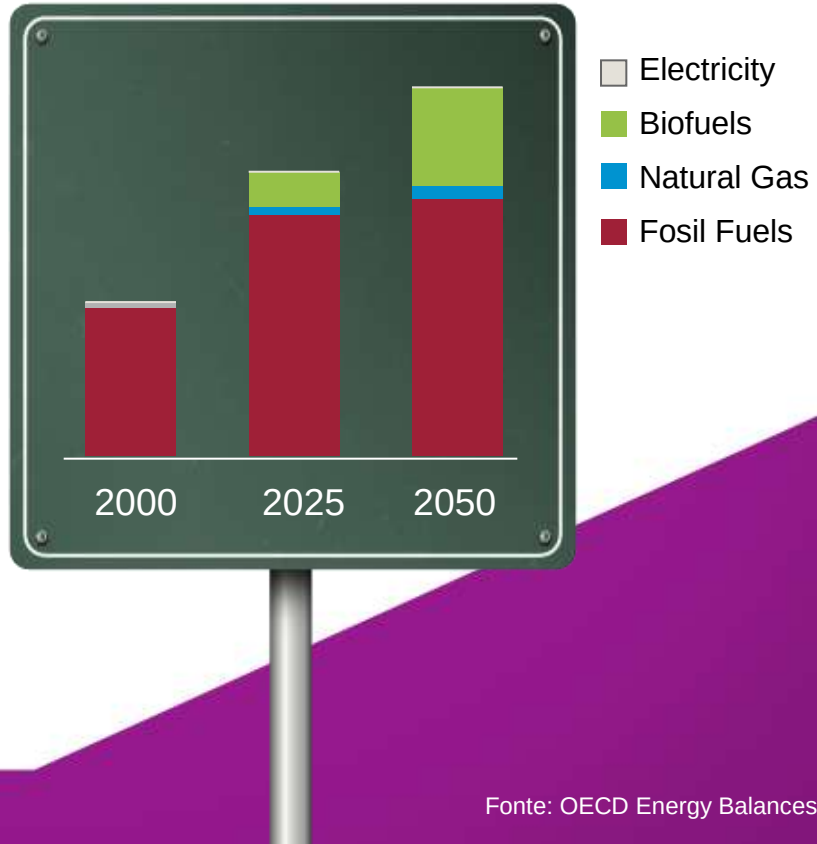
Biofuels can represent up to 30% of the transportation energy matrix by 2050

With planning and government support, it is possible to achieve a more **sustainable energy matrix**

EJ per Year



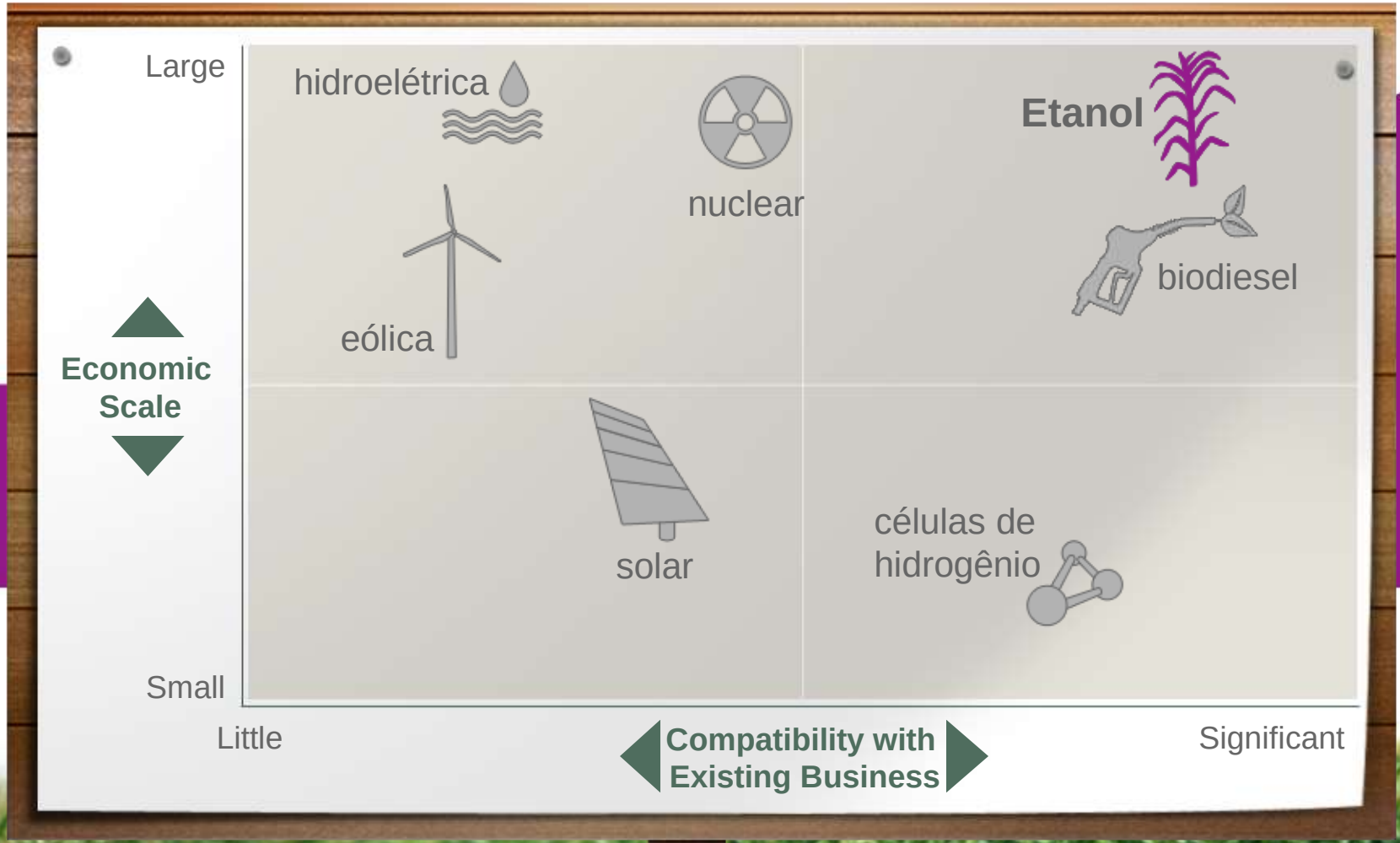
Energy Consumption in Transportation



Fonte: OECD Energy Balances (2006)

Biofuels as Part of the Solution

Today Biofuels are the option best aligned with existing distribution and consumption infrastructure



Biofuels as Part of the Solution

Brazilian sugarcane ethanol presents the best cost benefit option in terms of cost and carbon emissions

Energy Source	Emissions gCO2 eq/kcal	Costs in US$ cents/kcal
Carvão	1,147	0,0035
Gás Natural*	0,523	0,0055
Gasolina**	0,296	0,0075
Diesel**	0,483	0,0077
Nuclear*	0,035	0,0038
Solar (PV)*	0,041	0,0674
Eólica	0,077	0,0040
Etanol**	0,049	0,0064

*EUA | ** Brasil

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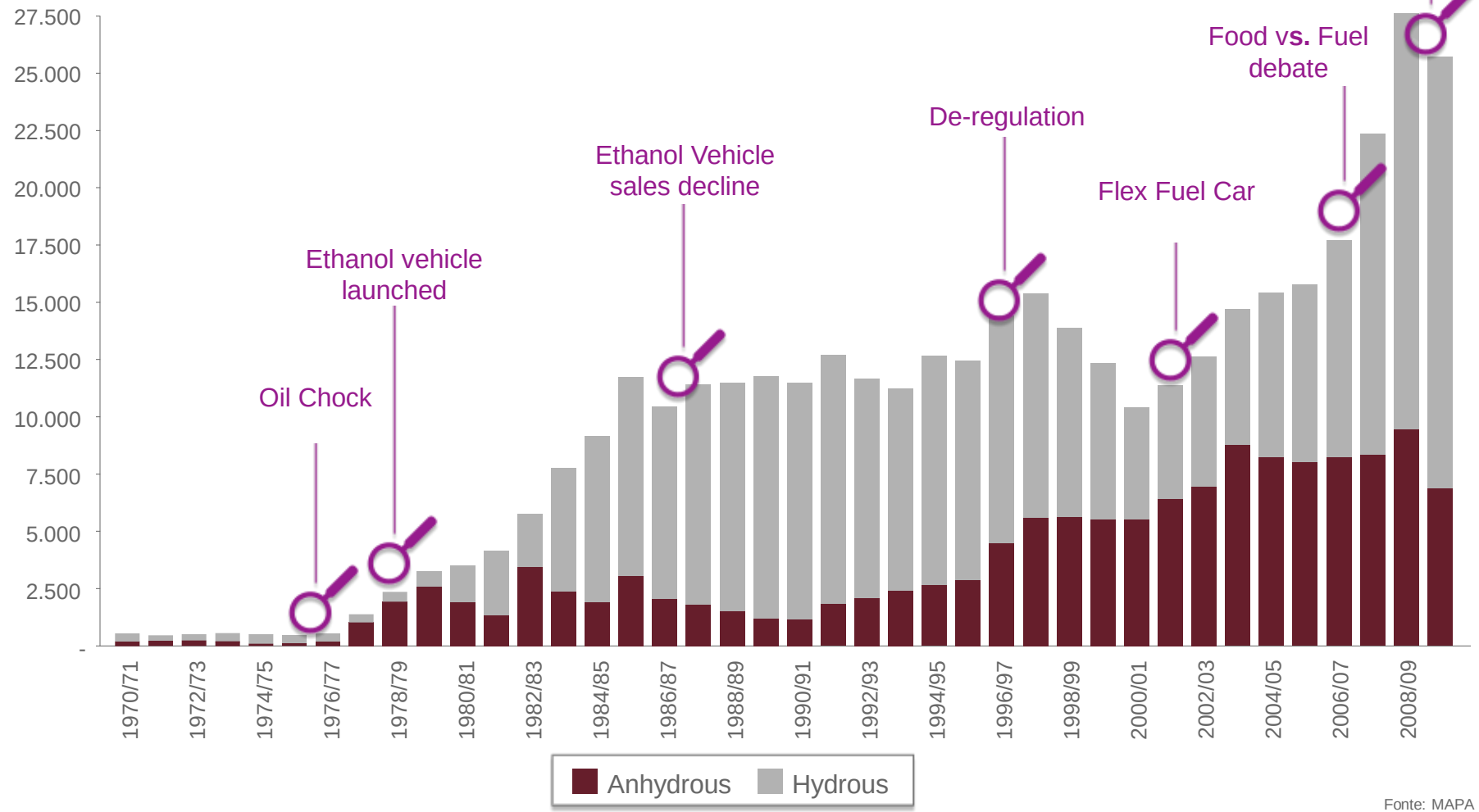
Brazilian Ethanol Market

The Brazilian ethanol market has overcome several challenges

Brazilian Ethanol Production Evolution

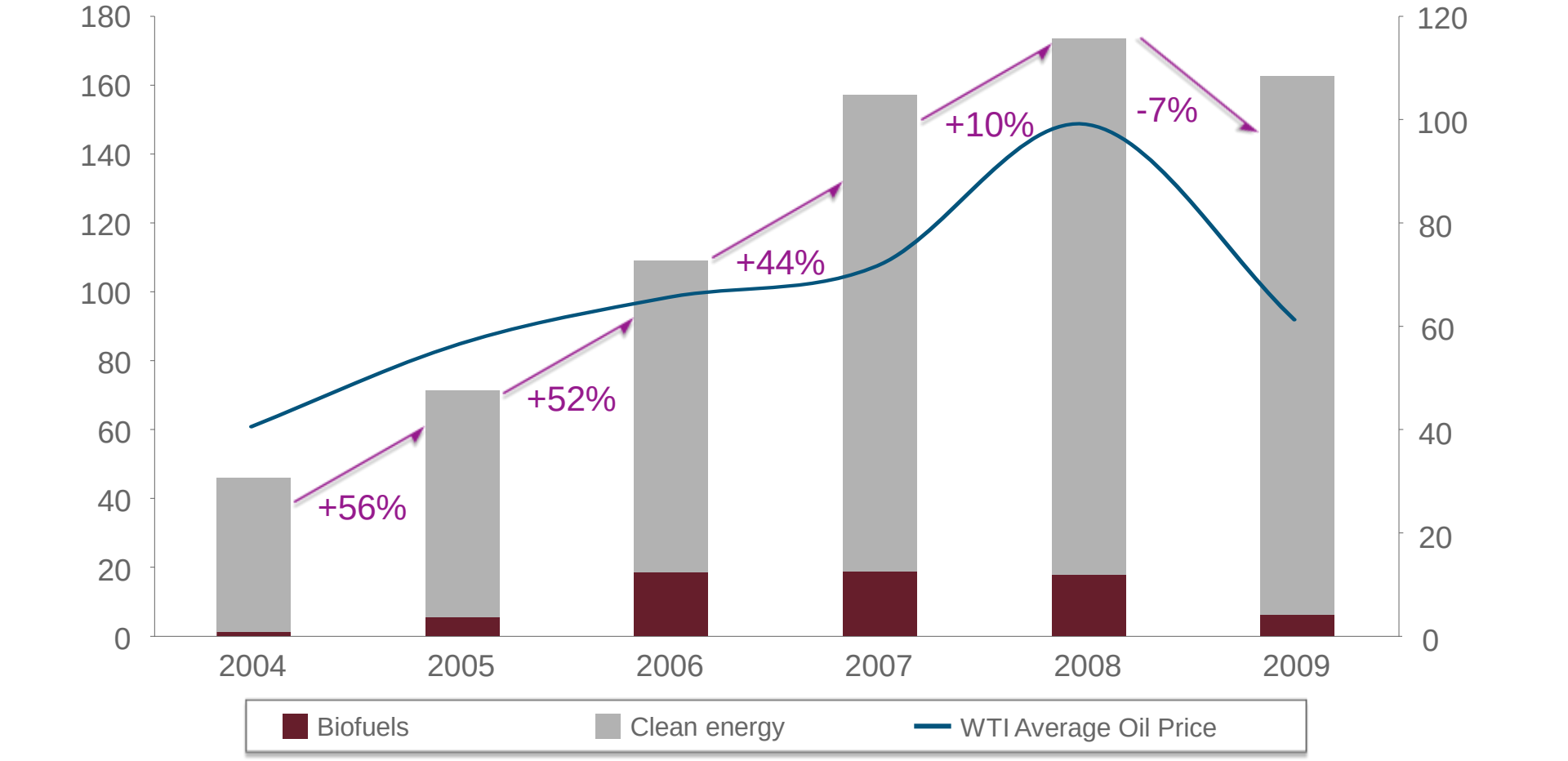


Fonte: MAPA (2010)

Brazilian Ethanol Market

Oil prices and concerns about climate change impact the growth of Brazil's ethanol market

Global Biofuels investment



Fonte: New Energy Finance (2010)

Brazilian Ethanol Market

Investors with long term view continue to invest in the sector even after the crisis

Investimento para entrada de **novos players**

EUA:

- Valero – Verasun (~ US$500 M)

Brasil:

- Petrobras – Tereos (~ US$900 M)
- Shree Renuka – Equipav (~US$650 M)
- LuisDreyfus – SantelisaVale (~US$1.700 M)
- Bunge – Moema (~US$1.700 M)
- Petrobras – São Martinho (~US$462 M)

Fonte: diversas

Brazilian Growth Potential

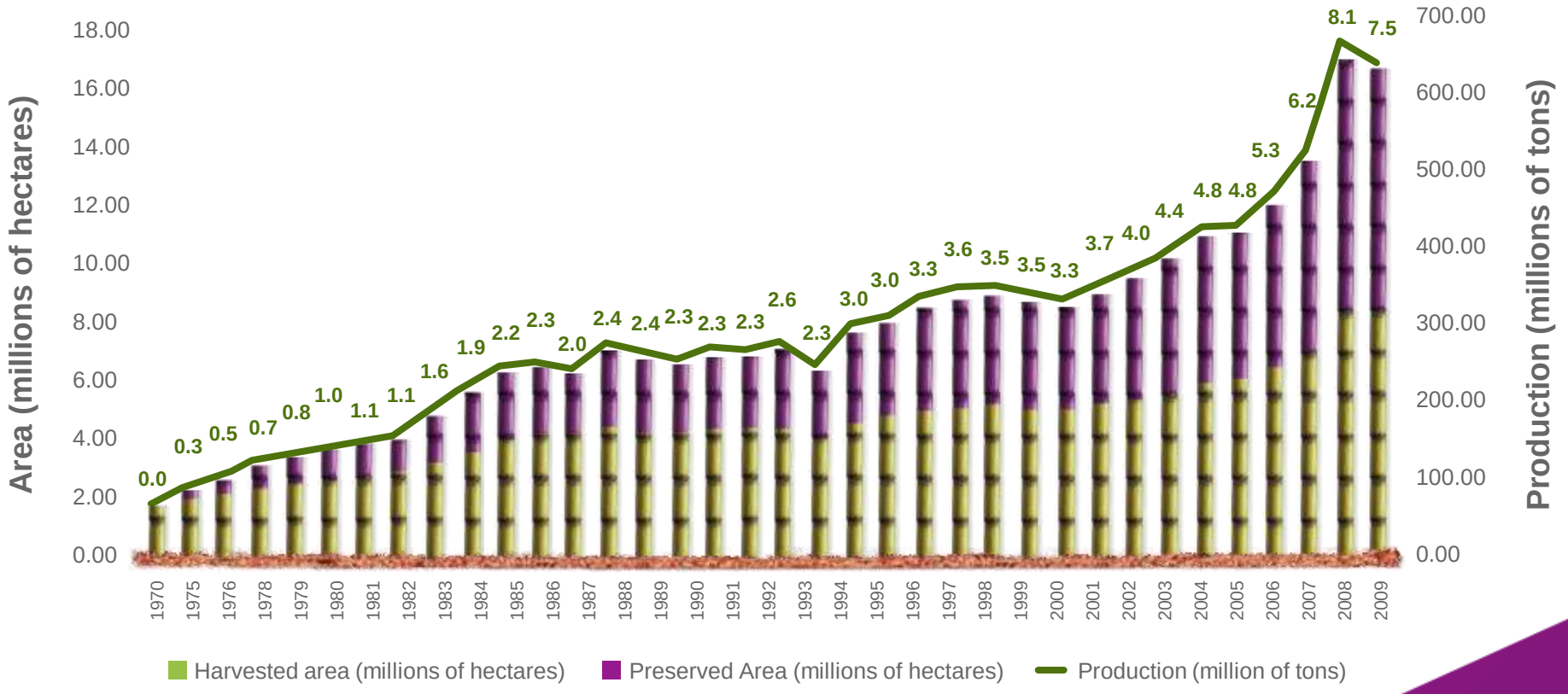
Brazilian arable land availability reinforces the scalability of the ethanol option

	Total Area	Protected & Native	Arable Area	Other
Millions of Hectares	**2851.48**	**495.61**	**329.94**	**25.92**
	100%	58%	38%	3%

Brazilian Growth Potential

Sugarcane productivity growth also point to ethanol as a scalable option

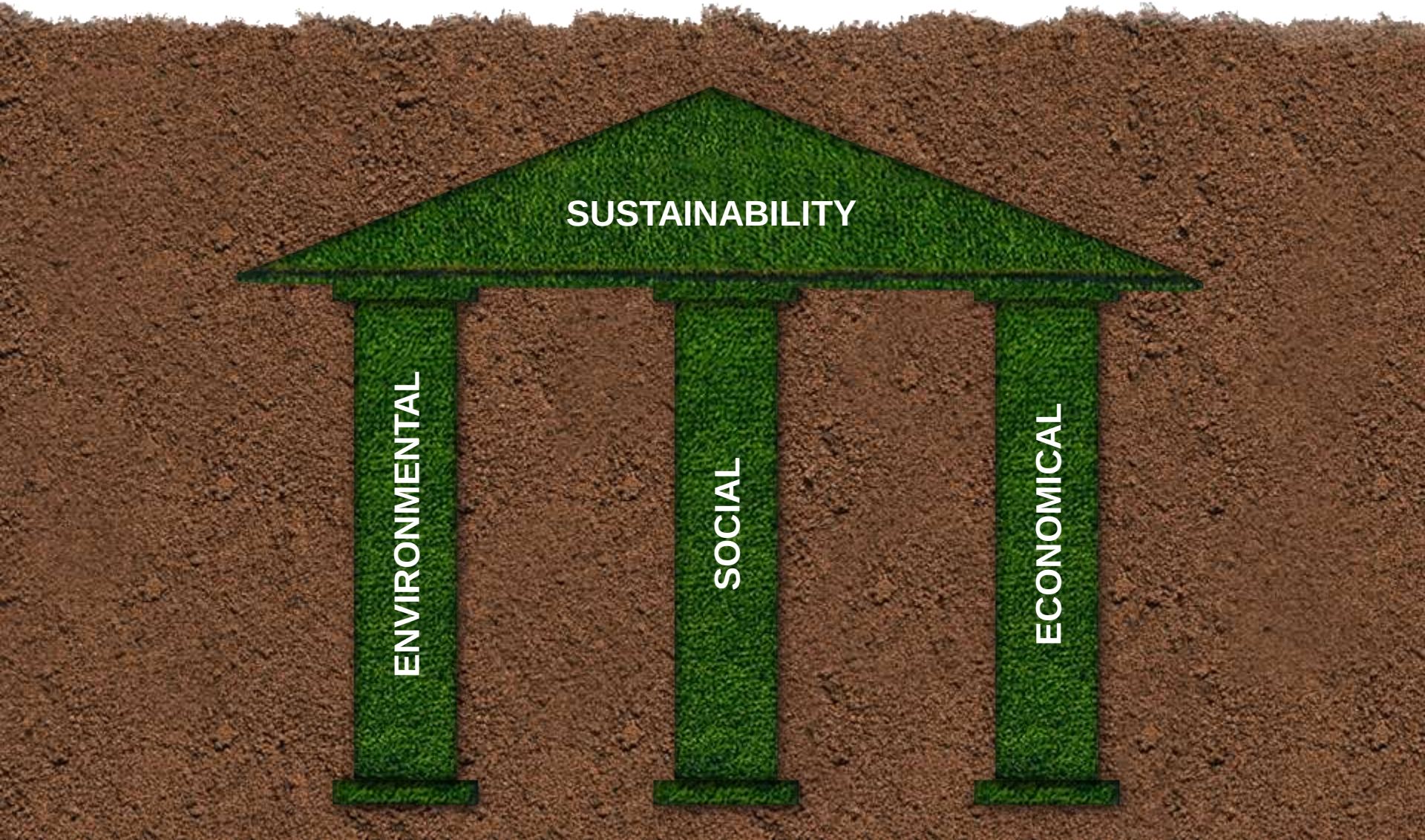
Productivity growth in sugarcane harvesting since 1970 has helped preserve 7,5 million hectares of arable land



Fonte: MME(2010)

The importance of sustainability

Demonstrating the sustainability of every operation has become critical



The Importance of Sustainability

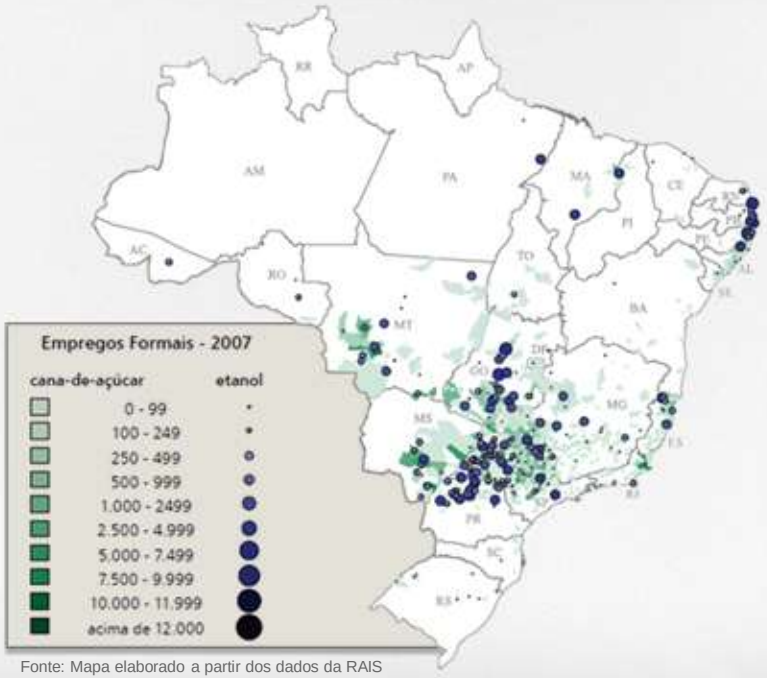
Studies show sugarcane ethanol's environmental sustainability

Fonte: UNEP 2009, Menichetti/Otto (2008) for bioethanol and biodiesel, IFEU (2007) for sugarcane ethanol, Liska et al. (2009) for corn ethanol; RFA 2008.

The Importance of Sustainability

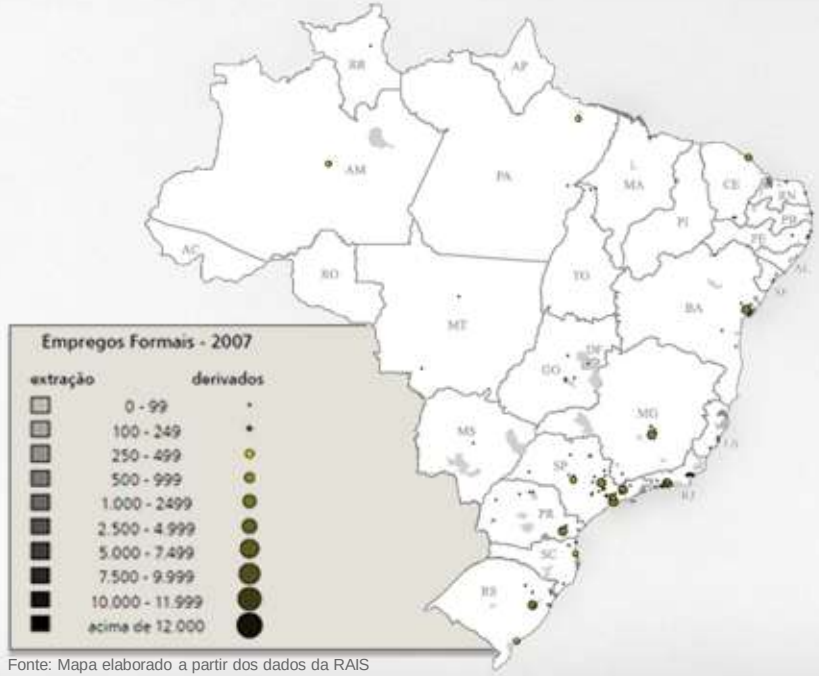
Social sustainability across

Ethanol's capillarity



Fonte: Mapa elaborado a partir dos dados da RAIS

Oil exploration concentration



Fonte: Mapa elaborado a partir dos dados da RAIS

2007 Data in Units

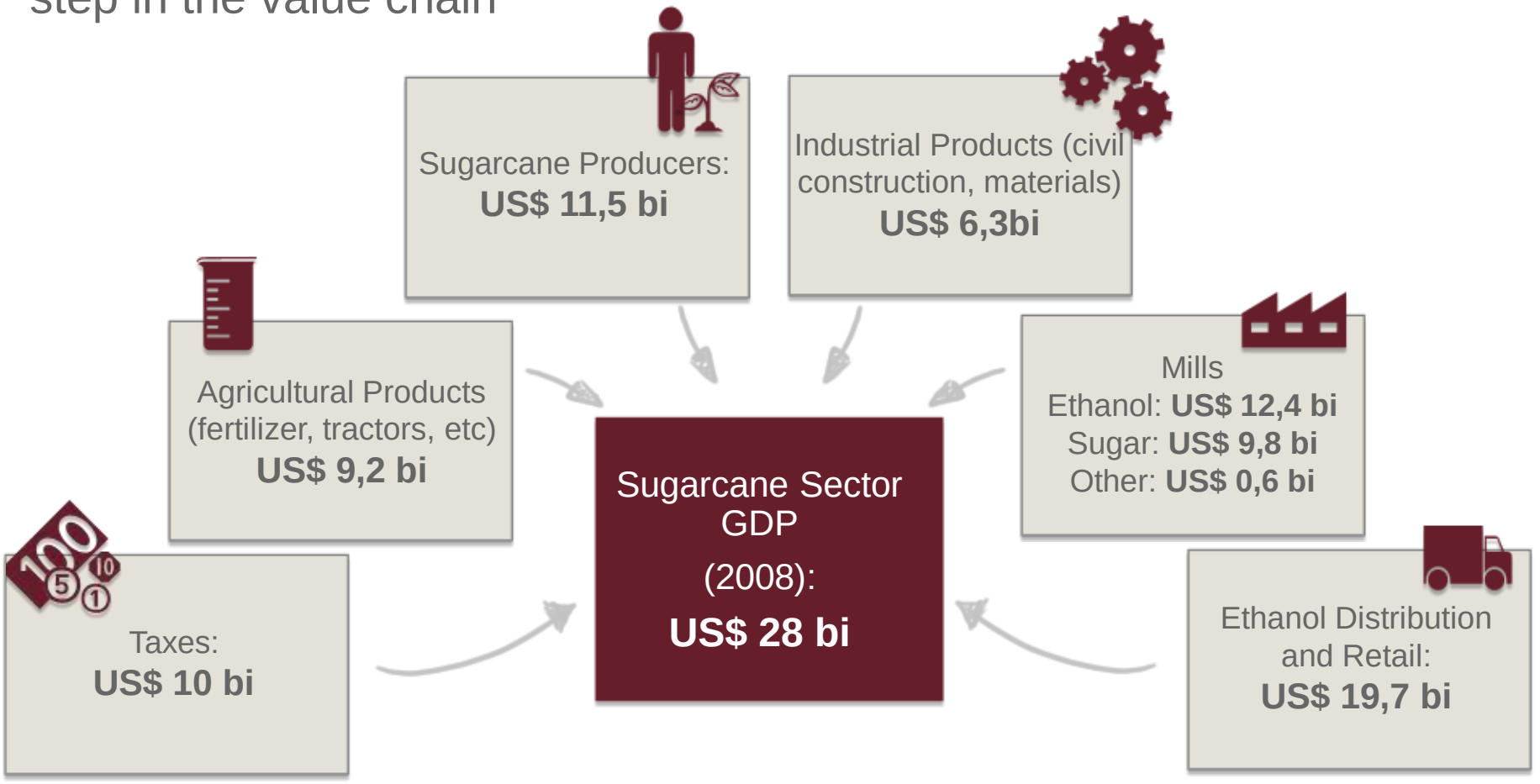
Sector	States	Districts	Jobs	Establishments
Ethanol (*)	25	1.042	465.236	16.829
Oil(**)	24	176	73.075	1.239

Nota: (*) includes harvesting and production. (**) Excludes oil extraction and non-fuel refining

Fonte: UNICA (2009)

The Importance of Sustainability

Ethanol is economically sustainable and creates value at each step in the value chain



2008 Consumer Savings: R$ 7,7 billion

(How much consumers saved by using ethanol rather than gasonline)

Fonte: Markestrat (2009), SCA (2010)

Producer's Perspective on Biofuels Certification

Globally accepted certification can greatly benefit the industry

Social and environmental certification are a global trend

Certification can:

- Differentiate products and support corporate reputation
- Facilitate buying decisions – increase liquidity
- Harmonize market demands – sustainability criteria consolidation
- Recognize best practices – sustainability premiums

What Biofuels Certification Should Aim At

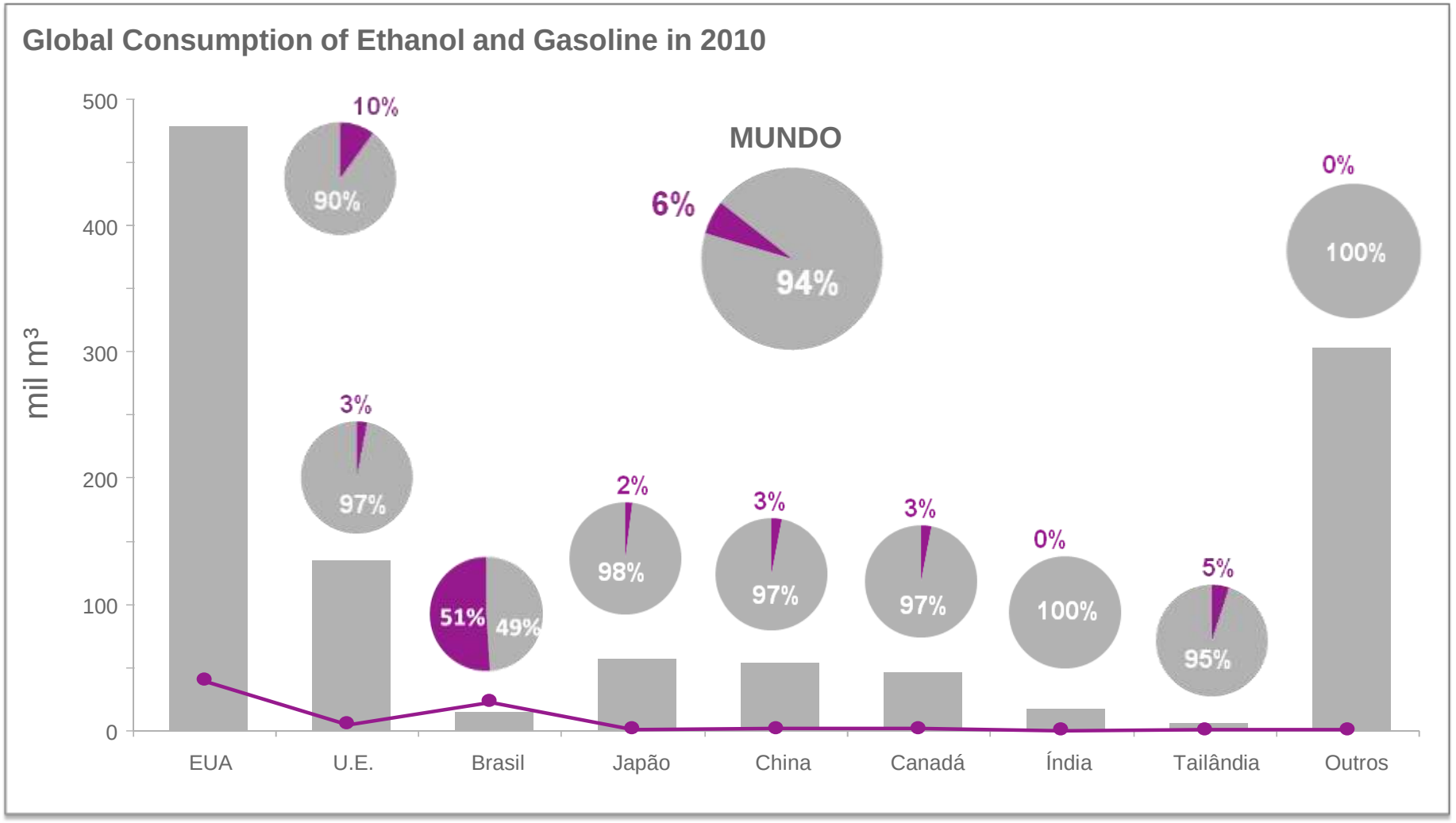
Producer's Recommendation for an Efficient Scheme

Certification Should

- Be **comprehensive** and **gradual**
- Involve all **relevant stakeholders** to ensure acceptability and implementation viability
- Be voluntary, with positive incentives
- Be balanced - **"Triple Bottom Line Approach"**
- Be **transparent** and **inclusive**
- Be scientific and **evidence based** Easily **measurable**
- **Be objective** - focus on essential issues to ensure sustainability

The Importance of Certification

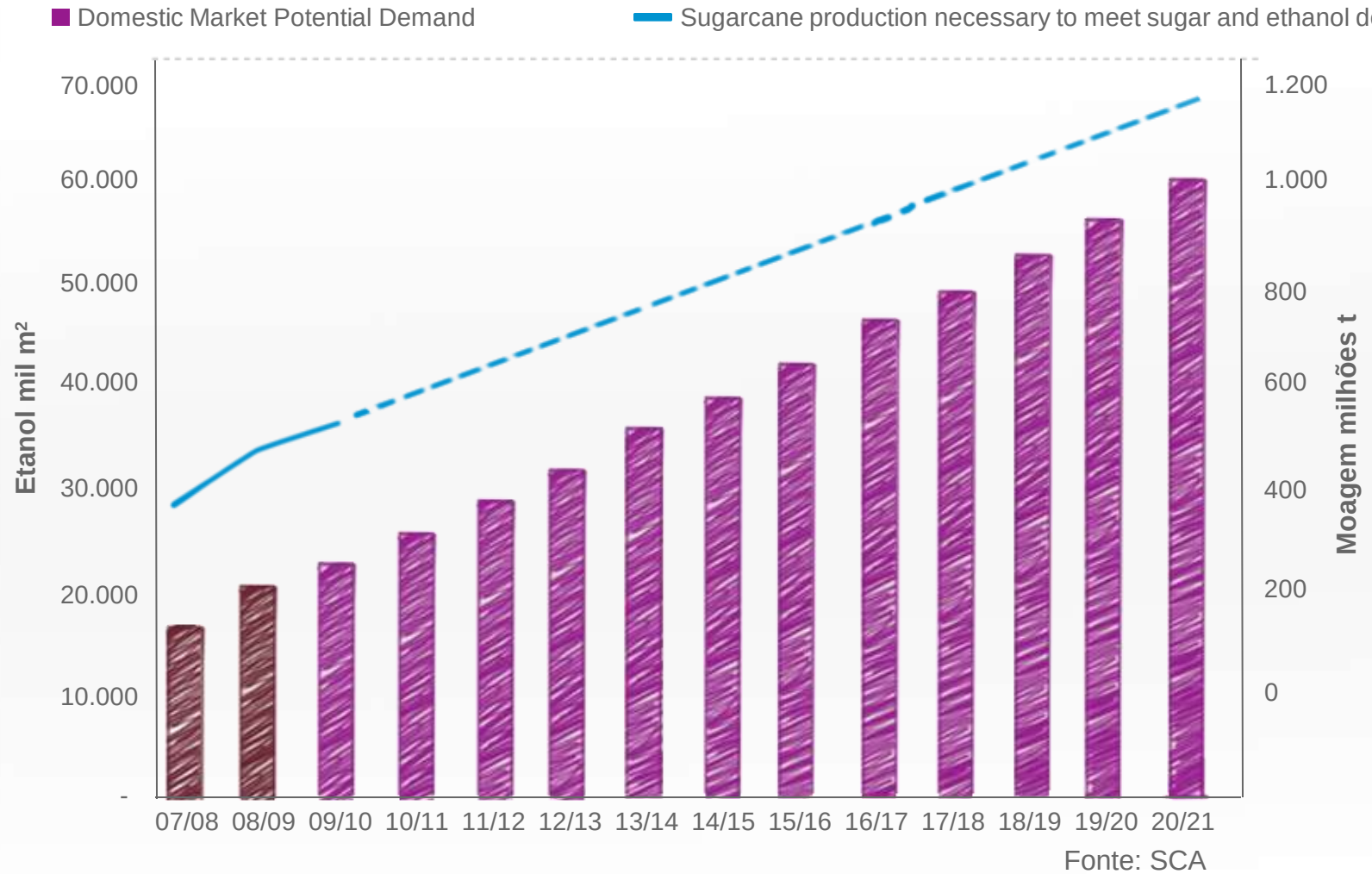
The use of ethanol can grow significantly in other markets



Fonte: EIA, ANP, F.O.Licht, EUROPIA

Ethanol Growth Perspective

Long term investment is necessary and the growth potential is significant



Fonte: SCA

Year	New Mills (2.5 M tons)
2010	**23**
2011	**18**
2012	**18**
2013	**19**
2014	**19**
2015	**19**
2016	**20**
2017	**20**
2018	**20**
2019	**21**
2020	**21**

Ethanol Growth Perspectives

Sugarcane ethanol presents clear sustainability qualities, but is it scalable?

By 2050 it will be possible to:

- Productivity increase – **85 t/ha** → **170 t/ha (new varieties)**
- Efficiency – **82 liters per ton** → **250 cellulosic ethanol**
- Engine and vehicle efficiency → **2x kilometers per liter**
- Size of the global fleet → **3x more vehicles**

Given the premises above, by 2050 it will be possible to produce more than **500 million m³**, using the current 23 million hectares in use for sugarcane in 2009

In this scenario, sugarcane ethanol can represent]
30% of the global fuel consumed in Otto cycle engines

Fonte: CTC

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