The Brazilian Sugar Industry
For ISMA

19th August 2013
Brazilian sugarcane sector – Historical Evolution

- **1933/June:** Establishment of the Sugar and Ethanol Institute (IAA) – *starting the state intervention on the Sector.*

- **70’s Decade - Released:**
  - Sugarcane Breeding Program to improve productivity and increase sugar exports.
  - Proálcool (Ethanol Program) – Objective to reduce energy dependency.
    - began in 1975 as a response to the oil crisis
    - established an E-5 mandate and encouraged the development and demand of pure ethanol-fueled cars (E-100)

*Source: UNICA*

*First vehicle with alcohol engine (Dodge 1800), Brazilian Aerospace Memorial Sao Jose dos Campos.*
Proálcool

- Introduced in 1975
- Until 1988, 95% of car sales were alcohol only (hydrated) cars
- What was the mix for anhydrous in the past and when was it introduced?
Automotive fuel mixture (Anhydrous Ethanol / Petroleum) - Chronology

<table>
<thead>
<tr>
<th>Dispositivo Legal</th>
<th>Abrangência</th>
<th>Mistura</th>
<th>Limite</th>
<th>Percentual fixado</th>
<th>Vigência</th>
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<td>Data Edição</td>
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<tr>
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<tr>
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<tr>
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<tr>
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<tr>
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<td>SP (Norte) MG (Sul)</td>
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</tr>
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<td>20/12/77</td>
<td>SP</td>
<td></td>
<td></td>
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</tr>
<tr>
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<td>09/02/78</td>
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<td></td>
</tr>
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<td>25/04/78</td>
<td>CE / RN / PB / PE / AL</td>
<td>23% &lt; &gt; 25%</td>
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<td></td>
</tr>
<tr>
<td>Portaria CNP nº 213</td>
<td>20/07/78</td>
<td>CENTRO SUL</td>
<td>20%</td>
<td></td>
<td></td>
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<tr>
<td>Portaria CNP nº 325</td>
<td>05/09/78</td>
<td>NORTE NORDESTE</td>
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</table>

Source: MINISTÉRIO DA AGRICULTURA, PECUÁRIA E ABASTECIMENTO

- 1986- Stabilizing International Prices of oil;
- Expansion of the brazilian production of oil;
- Control of the inflation and deficit plans were prioritized by the government;
- Government suspending fundings and cutting subsidies;
Brazilian Ethanol Production

Source: UNICA
Government Intervention Period

Four major pillars

**Production:** Regulation of the annual production by state of sugar and ethanol; amount of sugarcane delivered to each industrial plant;

*Every year, seasonal plans were released informing farmers and millers about the sugarcane quantity to be processed and the price to be paid.*

**Exports:** Government managing the exports of raw and white sugar.

**Prices:** Based on the production costs of (sugarcane, ethanol and sugar) prices were set for those products.

*The government also set the parities between sugar and ethanol to make it financially indifferent for the mills to produce either of the two products. At the pump, the price of Ethanol should not be higher than 65% of gasoline prices.*

**Consumption:** The Government set mandatory blends for ethanol in gasoline;

*made incentives for the establishment of ethanol distilleries attached to existing sugar mills;*

*No sugarcane processor could be established without authorization (IAA’s Act)*

Source: UNICA
History of Privatization-The Brazilian sugarcane sector after the state intervention period

*Sustained Growth*

- March 15 1990 – End of IAA (Instituto do Açúcar e do Álcool)
- Export quotas
- Alcohol quotas
90’s: Brazilian Economy start’s to move towards liberalization, openness and privatization.

The sugarcane industry start’s also to liberalize:

- 1990 - Closure of IAA
- 1990 - Elimination of public production and exports controls
- 1991 - The mandate for national agencies and sector ministries to took over some of the IAA tasks
- March 1996 - Liberalization (not total) of the prices of sugar and various types of alcohol.
- 1996 - By an action from the union’s was created the “Frente Parlamentar do Setor Sucroalcooleiro” composed of federal deputy's from the State of São Paulo, Alagoas and Pernambuco.
1997- The establishment of CIMA – The Sugar and Ethanol Inter-Ministerial Council

CIMA’s main roles: responsible for policies such as the definition of economic mechanisms for self-sustaining economic growth of the industry (e.g. establishment of credit lines for ethanol stocks); recommendation for the ethanol level blending in gasoline (20-25%); assessment of the participation of sugarcane in the Brazilian energy matrix. (UNICA, 2010)

1999 – Manifestation’s in cities widely disseminated by the media to protest against the lack of support to the sector.

1999- The “Act of Brasília” reunited producers and congressman’s in the “ National Day to fight for jobs”
- January 1999- Creation of the “Technical Chamber” from the CIMA.

Specialists from the sector indicated by the producers with the main objective to support the measures presented by the CIMA.

- February 1999 – “The year of the real liberalazation”

Date that prices of all the products (sugar and alcohol) were totally liberalized.

- August 1999- Mario Covas (Governor of São Paulo State) assigned the “Pact for Employment in the Sugarcane Industry”
The deregulation of the sugarcane sector

A Gradual Process

- Resistance of the sector on how to price the feedstocks.

1999: creation of sugarcane payment model named “CONSECANA”

- It is a private sector arrangement which main objective it to share risks between sugar and ethanol producers and sugarcane growers.

Main rules

- (1) the revenue of the sugarcane grower is proportional to the industrial revenue;
- (2) price of sugarcane supplied by each grower depends on the level of sucrose that the product contains

Source: UNICA
Exports

• Traditional export zone was northeast – access to terminals and distance to port
• Central-South was center more of consumption, whether alcohol or sugar
Brazil Sugar Export Corridor

Source: Rumo/ COSAN
How many Mills in 1990?

Source: IBGE
Sugarcane Planted Area (Hectares)
How many distilleries?

<table>
<thead>
<tr>
<th>Variável considerada</th>
<th>Safra 1987/88</th>
<th>Safra 1997/98</th>
<th>Variação (%)</th>
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<tbody>
<tr>
<td></td>
<td>S. Paulo</td>
<td>Brasil</td>
<td>S. Paulo</td>
</tr>
<tr>
<td>Usinas</td>
<td>73</td>
<td>196</td>
<td>92</td>
</tr>
<tr>
<td>Usinas com destilarias</td>
<td>67</td>
<td>158</td>
<td>87</td>
</tr>
<tr>
<td>Destilarias autônomas</td>
<td>77</td>
<td>216</td>
<td>42</td>
</tr>
<tr>
<td>Totaís</td>
<td>150</td>
<td>412</td>
<td>134</td>
</tr>
</tbody>
</table>

The Brazilian sugarcane sector after the state intervention period: sustained growth
Total Crush

Sugarcane crush (Million Tons)

- 1990/91
- 2005/06
- 2009/10
- 2012/13
Sugarcane area and yield

Source: UNICA- MAPA and CONAB (2009 e 2010). Note: TRS is the amount of product obtained per ton of crushed sugarcane.
Total Sugar Production and Exports

<table>
<thead>
<tr>
<th>Harvest season</th>
<th>Exports Million Tons</th>
<th>Production Million Tons</th>
<th>Exp/Prod</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007/08</td>
<td>18.6</td>
<td>31.0</td>
<td>60%</td>
</tr>
<tr>
<td>2008/09</td>
<td>20.8</td>
<td>31.1</td>
<td>67%</td>
</tr>
<tr>
<td>2009/10</td>
<td>24.1</td>
<td>32.9</td>
<td>73%</td>
</tr>
</tbody>
</table>

Source: MAPA, UNICA e Secex. Note: 2009/10p – preliminary data as production for North-Northeast region was calculated from data obtained up to August 16, 2010. Data regarding sugar exports from 1989 until 1995 refers to civil year.
Indefinition between 1990 and 2000
Annual Growth Rate 1990-2000

Source: CANAPLAN
Ditto for 1999

• Then climactic problems of 99/00 as well as economic problems
• Crops since then
• The growth period of 2000/10 – Brazil’s expansion in the sugar market
• Prices there of
• Inflation in Brasil
Total Sugar Production and Exports – Based 1999

Source: MAPA, UNICA e Secex. Note: 2009/10p – preliminary data as production for North-Northeast region was calculated from data obtained up to August 16, 2010. Data regarding sugar exports from 1989 until 1995 refers to civil year.
Crop Since 1999

The graph shows the crop production for Brasil, India, and China from 1990 to 2008. The production for Brasil, represented by the blue line, shows a steady increase. India, represented by the red line, also shows an increase but with fluctuations. China, represented by the green line, has a relatively stable production level with minor fluctuations. The data indicates a general upward trend for all three countries.
Source: CANAPLAN
Brazil’s Expansion in the Sugar Market

- Historic of the Sugar Production

\(\text{in million tons, raw value}\)

- Since 2005, sugar production in Brazil rose 40.5%, while Rest of the World rose 16.1%.
Sugar Exports, Brazil & the rest of the world

(in million tons, raw value)

- Since 2005, Brazil’s sugar exports rose 63.9%, while Rest of World felt 5.8%.
2003- Deregulation Release of Flex Fuel Models
Expansion of the flex-fuel technology

Number of flex-fuel models

Source: DATAGRO
March 2010: the Brazilian flex fuel fleet reached **10 million** vehicles.

Source: DATAGRO
Consumption of Gasoline and Ethanol

Evolution of Brazilian ethanol and gasoline consumption

Source: DATAGRO
Consumption of Gasoline and Ethanol

Source: CENTRAL BANK - ANP
Greenfields

• Where was the industry going
• How much expansion
• Where
• The errors?
Since the 2008 financial crisis

- What has happened to growth
- What has happened to the utilization of alcohol in the Otto cycle
- What has been the impact of flexi fuel in cars since their introduction
- Why is the current use of alcohol not beyond 35% of total Otto cycle consumption
The International Economic Crisis and the discovery of the Pré Sal

CHANGE ON THE BRAZILIAN ENERGY POLICY

- Increased state intervention;
- Interruption of concession auctions of exploration areas;
- Freezing the price of fuel (gasoline and diesel);
- Crisis ethanol / biodiesel;
- Manipulation of electricity tariffs.
Now, the participation of gasoline at the Otto Cycle reached the level of prior periods of popularization of technology flex fuels

Source: Petrobrás
When it reversed the trend of ethanol consumption, accumulated decrease of about 40% in the period .......
Where do we go from here

- Further consolidation?
- What consolidation has taken place?
- Mills closing
Mills closing

- Less greenfields and more mills paralizing their activities

Source: ITAU BBA
New Mills in Brazil

Source: EPE
Map of Production

Source: UNICA
Happy price

• What is the happy price for Brasil?
• Logistics costs
• Currency
• Mechanization etc..
What is the happy price for Brazil?

- ???????
Logistic Costs

❖ Shipping cost (nearest port)

Source: MOVIMENTO PRÓ LOGÍSTICA
# Logistic Costs

Matrix of Transportation - Comparative

<table>
<thead>
<tr>
<th></th>
<th>Brazil</th>
<th>Argentina</th>
<th>USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highway</td>
<td>58%</td>
<td>80%</td>
<td>5%</td>
</tr>
<tr>
<td>Rail</td>
<td>25%</td>
<td>18%</td>
<td>35%</td>
</tr>
<tr>
<td>Waterway</td>
<td>13%</td>
<td>2%</td>
<td>60%</td>
</tr>
</tbody>
</table>

Source: MOVIMENTO PRÓ LOGÍSTICA
Currency

Source: THOMPSON REUTERS
Labor Costs in Brazil

UNIT LABOR COST
(IN USD, 2002=100)

Source: Credit Suisse
Mechanization

Evolution of Mechanization in the Central South Region

Source: CANAPLAN
What do we expect in the future

- The first conclusion is that the sector is without definition for the middle to long term.

- In general the groups are completing the process of recovery of agricultural yields and learning curve of mechanization. All the focus is now to reduce the costs.

- Investments in expansion are made in an extremely selective way and always focus on a higher efficiency and cost reduction.

- Sector close to the installed capacity. And.....Will the government make the long-term policies needed to start a new cycle of expansion?

- Market conditions extremely severe, because of the low prices of sugar, ethanol and energy, will continue to drive a significant number of companies into insolvency.
• Low interest of new entrants to invest in the sector. Still some trading and few oil companies has made some attempts. Consolidation process is virtually paralyzed.

• Training of human resources and investment in R&D, for improvement of yields and cost reduction, has been made and are absolutely fundamental to increase the competitiveness of ethanol in relation to other sources of fuel and foster new uses of aggregate output.

• Adding value to the ATR and bagasse produced by second-generation ethanol, cogeneration from biomass (bagasse and straw), are essential to bring sustainability to the sector.
OVERVIEW ABOUT PUBLIC POLICY

- UNCERTAINTY
- REASONABLE DISTANCE BETWEEN POLITICAL AND TECHNICAL TIME
- LACK OF TRANSPARENCY AND CAPITAL SECURITY
THANK YOU!