



# SUGAR

**A look at the Brazilian and international  
market for sugar and ethanol**

**Arthur Ware / [Arthurware.com](http://Arthurware.com)**

**May 2009**



**Sugarcane is grown in every tropical country and consumed worldwide**



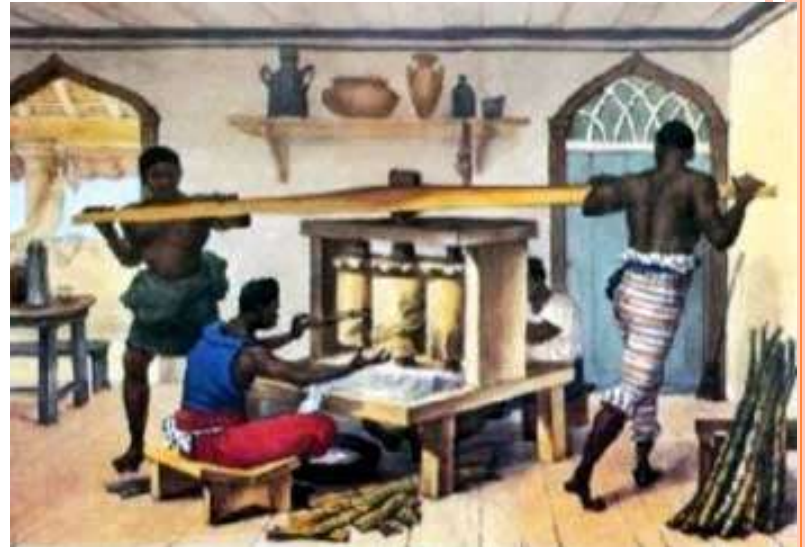
# INTRODUCTION - HISTORY

Sugar has been a part of Brazil nearly since the Portuguese first arrived in 1500. By 1518 the first plantation was in operation, and by the 1530's, Brazilian sugar was well established in European markets.

Sugarcane is grown mainly in South-Central and Northeastern Brazil, with two different harvest periods: from April to December in South- Central Brazil, and from September to March in the Northeast.

Cane production is split evenly between ethanol and sugar, and the organic material leftover after extracting the cane juice is burned to produce electricity. All mills are self-sufficient in producing their own energy needs.

Brazil's geography, water, soil, and climate ensure its place as the world's leading international exporter.



# MARKET IN BRAZIL TODAY



- 571.4 million mt of sugar cane will be produced in the 2009/10 season, nearly double the amount just 5 years ago.
- Brazilian sugarcane cultivation today occupies 7.8 million hectares, or 2.3% of the country's total arable land.
- Volatility of the last few years in the world oil markets have driven up demand for ethanol as a renewable fuel. Increased demand for both sugar and ethanol has been met through increased cane production and heavy investment in new capacity.

Following this period of heavy investment in the market, however, Brazil is currently faced with a period of falling margins, and increased capacity which, together with heavy debt loads in a credit tight environment, will lead to consolidation and dislocation in the short term.

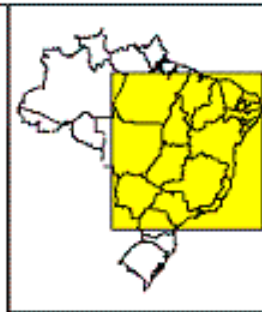
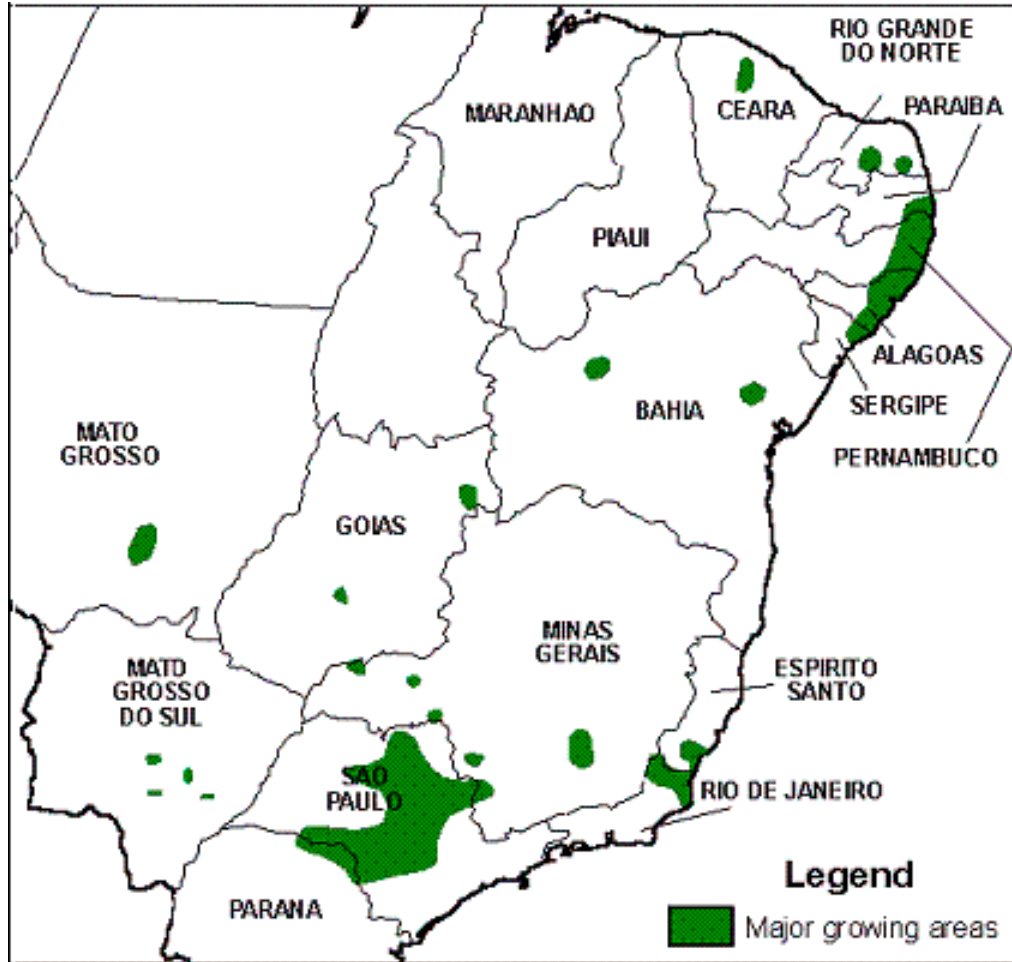
# PROÁLCOOL

- Brazil is a pioneer in using ethanol as vehicle fuel. The country first began using ethanol in automobiles as early as the 1920s, but the industry gained significant momentum in 1975 with the introduction of ProAlcool, a trailblazing federal program created in response to global oil crises. ProAlcool made ethanol an integral part of Brazil's energy matrix through subsidies and tax incentives.
- The program survived years of low petroleum prices and today is no longer receiving government subsidies, as ethanol is competitive with oil at \$40 per barrel.
- Producers have good industrial flexibility to switch between ethanol and sugar production. Unforeseen circumstances in world oil prices, or production variations in Australia, India, Thailand or other big sugar exporters can change the market prices dramatically. If sugar prices become very attractive then the ethanol consumers – in Brazil and abroad – can face a shortage of product. This happened in 1989, when the sector became deregulated and an ethanol shortage ensued on the domestic market.



Over half the new mills coming online in recent years, however, are dedicated entirely to the production of ethanol. These mills have no ability to switch to sugar

# BRAZIL SUGAR CANE GROWING AREAS

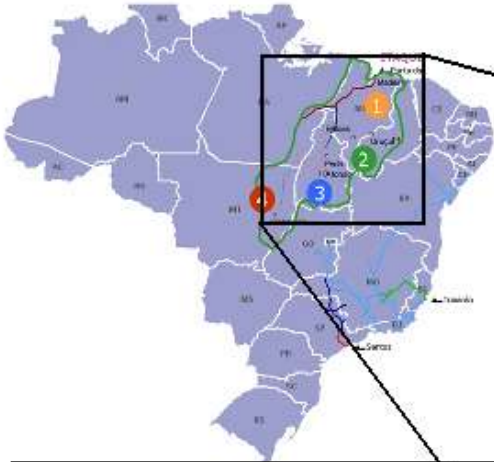


## Regional Statistics

	Center-South	Northeast
Sugarcane Production	75 - 80%	20 - 25%
Raw Sugar Production	60 - 65%	35 - 40%
Ethanol Production	80 - 85%	15 - 20%
Sugar for export	25 - 30%	70 - 75%

- The South-Central area accounts for 87% of total production. São Paulo state alone produces more than 60% of all Brazil's sugarcane.

# MATOPI PROJECTS



A partnership between Petrobras and Japanese firm Mitsui is expected to begin operations in 2010 or 2011. It calls for a string of up to 22 refineries in the MATOPI region of Brazil dedicated to producing ethanol and energy. The initial phase will start with 5 factories with a combined output of 1 Billion litres of ethanol for export to Japan.



Arrows indicate areas of greatest growth potential in MATOPI.

- They are centered on the major rail ways, the Nor-Sul line and the Carajas line both owned by VALE..



# CURRENT MARKET IN BRAZIL

**In 2008 annual gross earnings from the sugar and ethanol sector in Brazil was US\$20 Billion.**

**53% from Ethanol**

**85% Domestic**

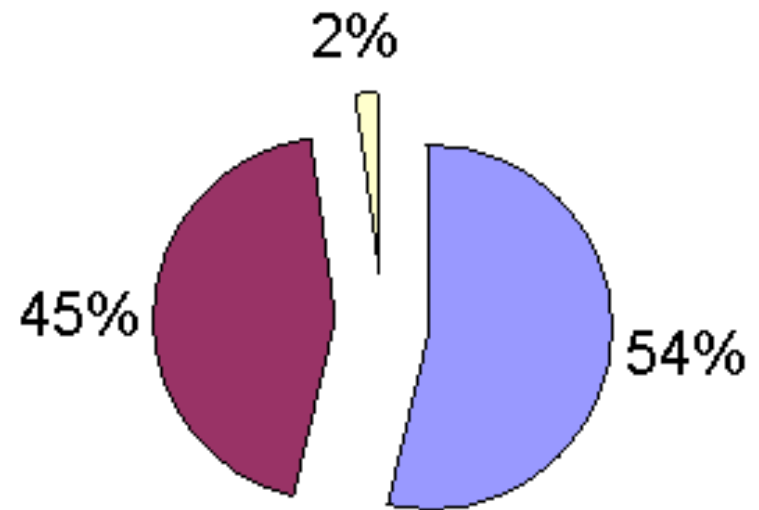
**15% Export**

**45% from Sugar**

**36% Domestic**

**64% Export**

**2% from Electricity**



# BRAZIL PROJECTIONS

## Projections for the Brazilian sugarcane industry

	2007/08*	2010/11	2015/16	2020/21
Sugarcane Production (million tonnes)	487	601	829	1,038
Cultivated Area (million hectares)	7.8	8.5	11.4	13.9
Sugar (million tonnes)	30.6	34.6	41.3	45.0
Internal Market	10.4	10.5	11.4	12.1
Surplus Export	20.2	24.1	29.9	32.9
Ethanol (billion liters)	22	29.7	46.9	65.3
Internal Market	18.4	23.2	34.6	49.6
Surplus Export	3.6	6.5	12.3	15.7
Bioelectricity (MWa) *	1,800	3,300	11,500	14,400
Bioelectricity in Brazilian Energy Matrix (%)	3%	6%	15%	15%

**Note:** \* MWa = firm capacity. Potential generation of surplus electricity has been calculated as follows:

- For 2007/08 and 2010/11, remaining surplus in MWa to be sold on the commercial power market, once mill's own need for electricity has been used, based on the utilization of 75% of the available bagasse.
- For 2015/16 and 2020/21, remaining surplus in MWa to be sold on the commercial power market, once mill's own need for electricity has been used, based on the utilization of 75% and 50% of the available bagasse and straw. The remaining 50% of straw is left on the field as organic matter.

**Source:** Unica, Copersucar and Cogen.

# INPUTS - CANE



# SUGARCANE – SOURCE OF GREEN ENERGY



**JUICE**

**SUGAR**



**BAGASSE**

**Ethanol**

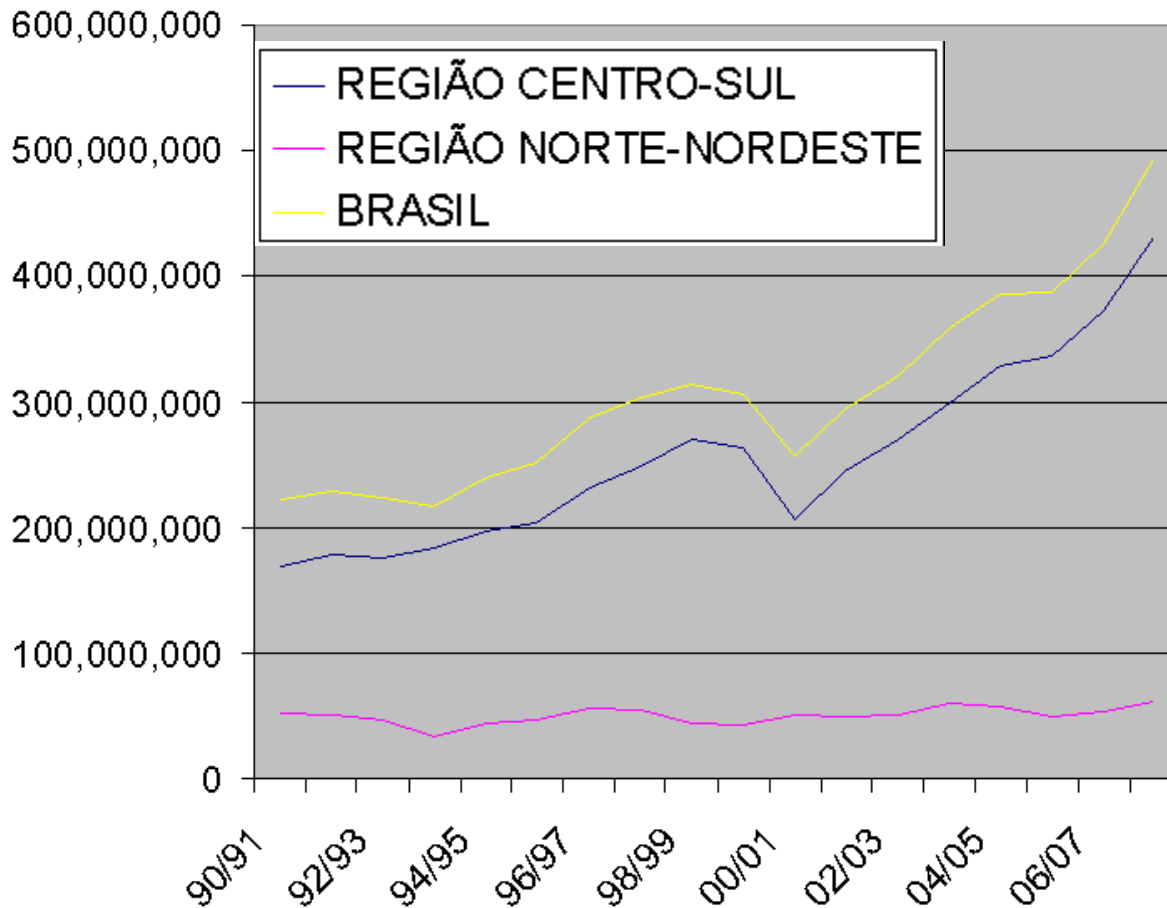


**LEAVES & TOPS**

**CO-GENERATION  
OF ELECTRICITY**



# SÃO PAULO STATE DOMINATES PRODUCTION



Steady increases in cane production have taken place alongside record grain and oilseed harvests. The food vs fuel debate has yet to reach Brazil.

And remember cane production occurs on only 2.3% of Brazil's arable land and half that cane goes to sugar not ethanol.



# LOGISTICS OF CANE

- Sugar cane, once cut, begins to lose its potential almost immediately. In the U.S., where ethanol is made from corn, any company can build a refinery and buy corn on the open market. But because sugar cane's heft makes it costly to transport, and its sucrose content degrades quickly, crops are always planted close to the mills that process them.
- This results in a clear area of influence in a 30km to 40 km radius of each mill. Beyond this distance the logistics costs and time of travel outweigh the value of the cane.



# PRICING STRUCTURE – “CONSECANA” & “CANOESTE”

- Cane prices are set by the cane growers associations and published on a monthly basis giving producers and mill owners statewide a common base price for sugarcane.
- The price is determined by a formula taking into account the prices received by the mills for sugar and ethanol, local prices, exchange traded futures for ethanol and sugar, as well as input costs for the production of cane and other factors.
- Typically, 60% of the operating cost of a sugar mill is consumed by the production or purchase of cane.



# MILL – GROWER RELATIONSHIP

- The traditional mills often have a good relationship with the sugarcane producers and historically have directly produced 40% of their own sugar cane needs.
- For the new projects, so called “green fields,” mill owners try to attract traditional sugarcane producers from other country regions to be their partners and sign them to long term contracts. This allows mill owners to maintain guaranteed cane inputs without having to manage the agricultural side of the business.



# LAND VALUES

- Growing potential and logistics of finished products are the main drivers of the differences in land values.
- Sugarcane fields covered approximately 20% of São Paulo's agricultural lands in 2007/08, at 3.7 million hectares. for the coming crop, this has increased to 4.3 million hectares, an increase of more than 15%, but is expected to remain flat in 2010.

## Prices for planted farmland by state

Regiões	Valor mínimo	Valor máximo	Valor médio 2008 (A)	Valor médio 2007 (B)	% nominal (A/B)	% real (A/B)
R\$/hectare						
Bauru	3.306	16.529	10.193	9.091	12,1%	0,8%
Piracicaba	7.438	33.058	15.162	12.540	20,9%	8,7%
Pres.Prudente	2.273	7.025	3.957	3.163	25,1%	12,5%
Rib.Preto	9.504	<u>41.322</u>	<u>24.859</u>	19.835	25,3%	12,7%
S.J.Rio Preto	7.438	20.661	13.344	12.127	10,0%	-1,1%
Estado de São Paulo	1.033	<u>41.322</u>	13.288	11.528	15,3%	3,6%

Elaboração & Análise: DATAGRO

Dados Básicos: IEA

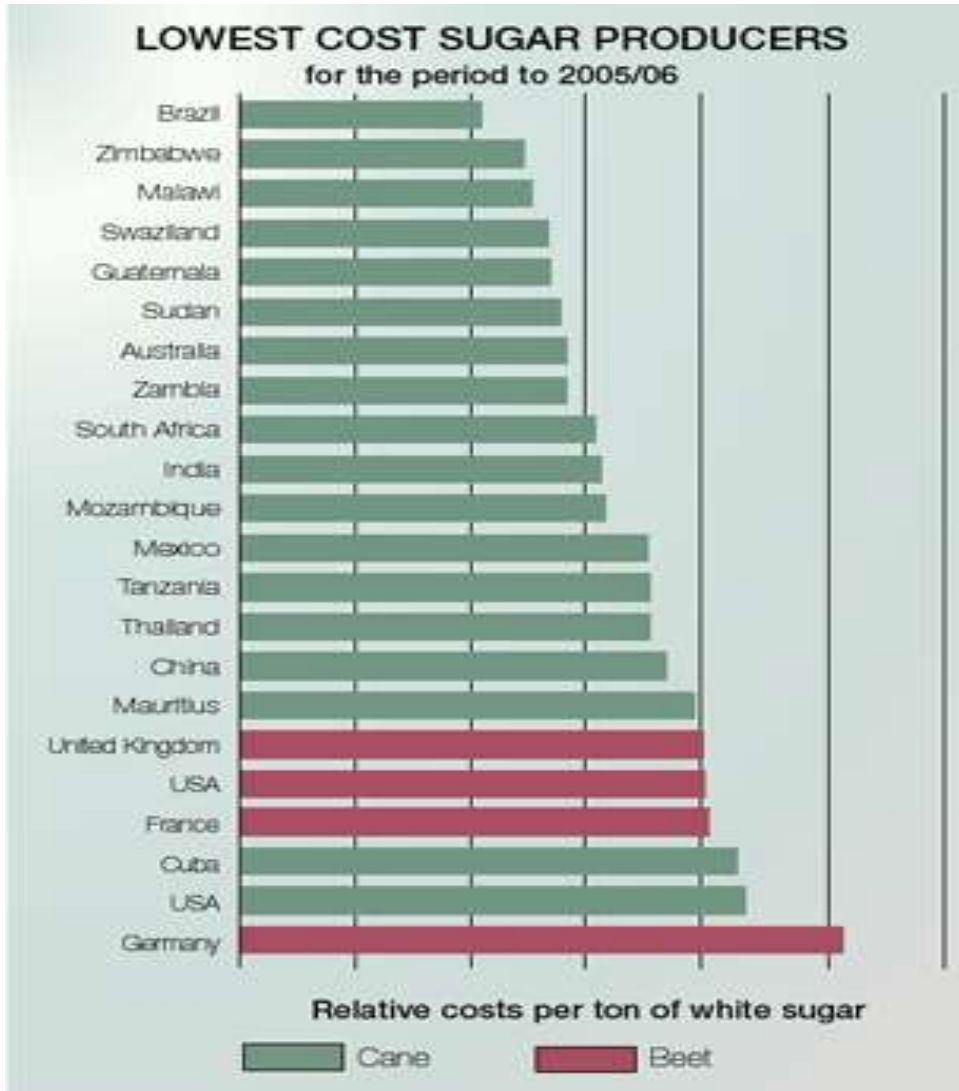
Nota1: Preços foram deflacionados pelo IGP-DI de 2008

# OUTPUTS

- Sugar
- Ethanol
- Energy



# WORLD LOW COST PRODUCER OF SUGAR

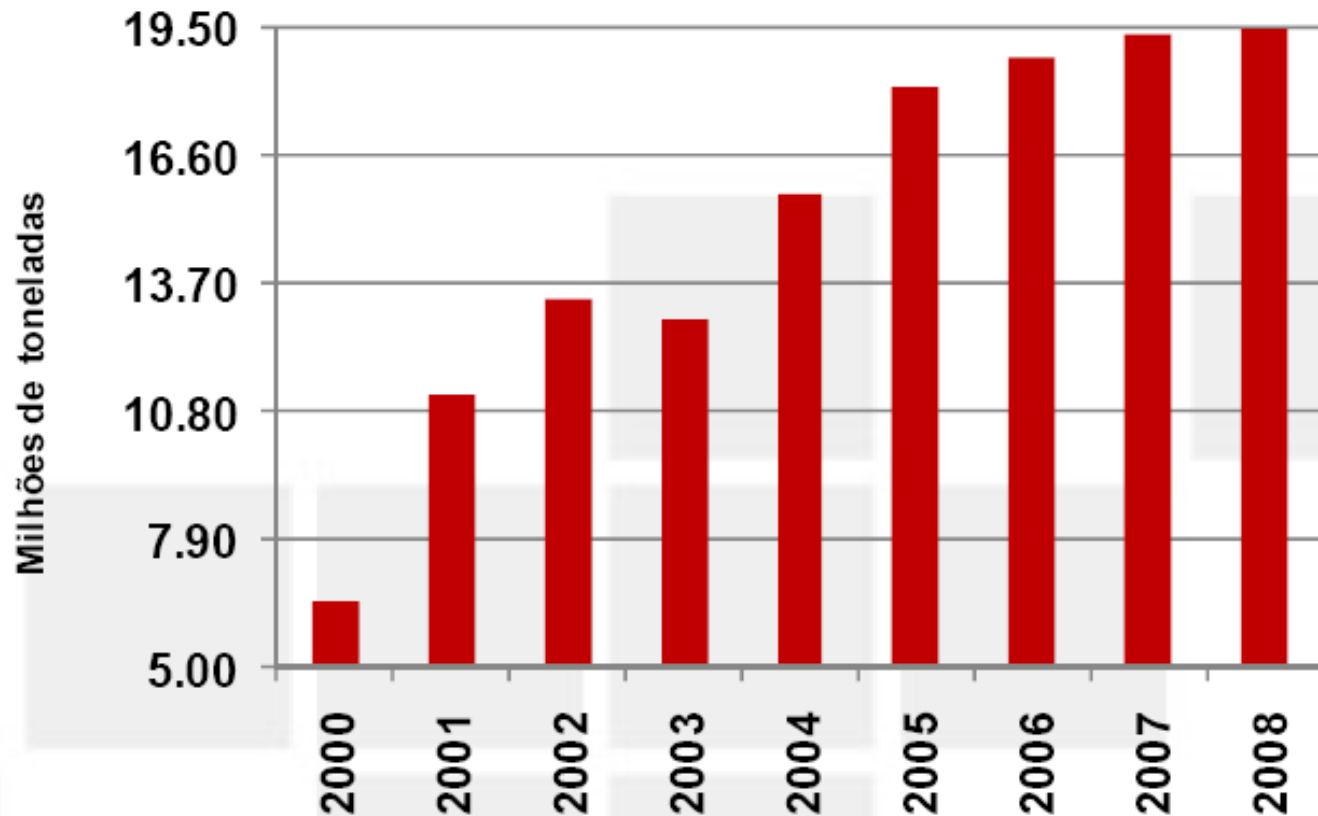


## COUNTRY      Cents/Lb

- Brazil: 10.96
- Colombia: 12.21
- Thailand: 12.50
- Australia: 13.62
- Guatemala: 14.85
- South Africa: 15.12
- India: 15.67
- USA: 24.51
- EU: 32.19



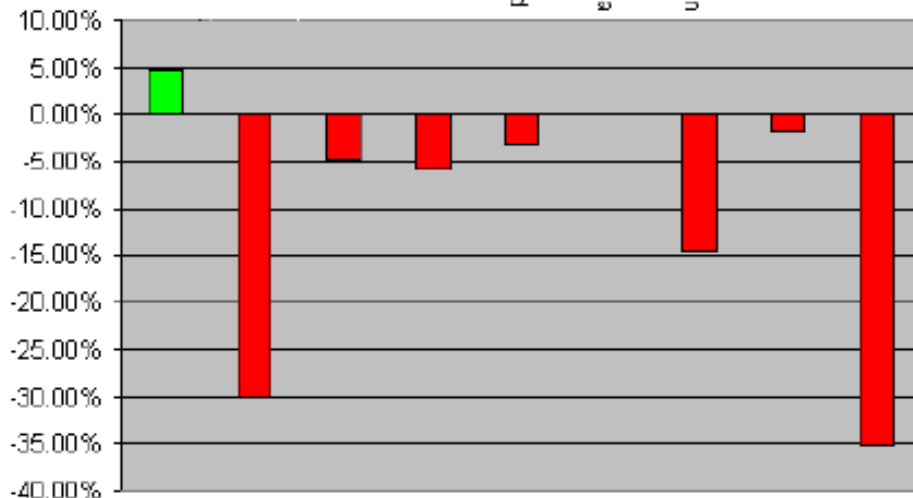
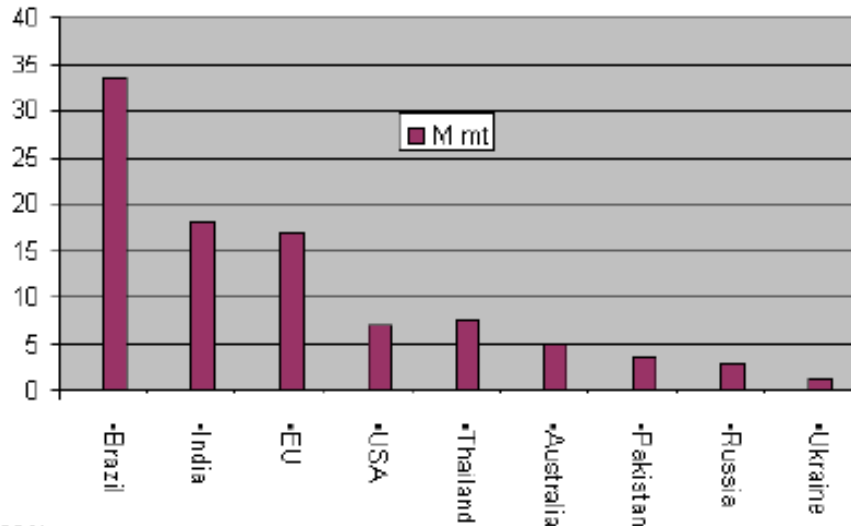
# BRAZILIAN SUGAR EXPORTS: RATE OF GROWTH IS SLOWING



Elaboração & Análise: DATAGRO  
Dados Básicos: SECEX



# GROWING MARKET



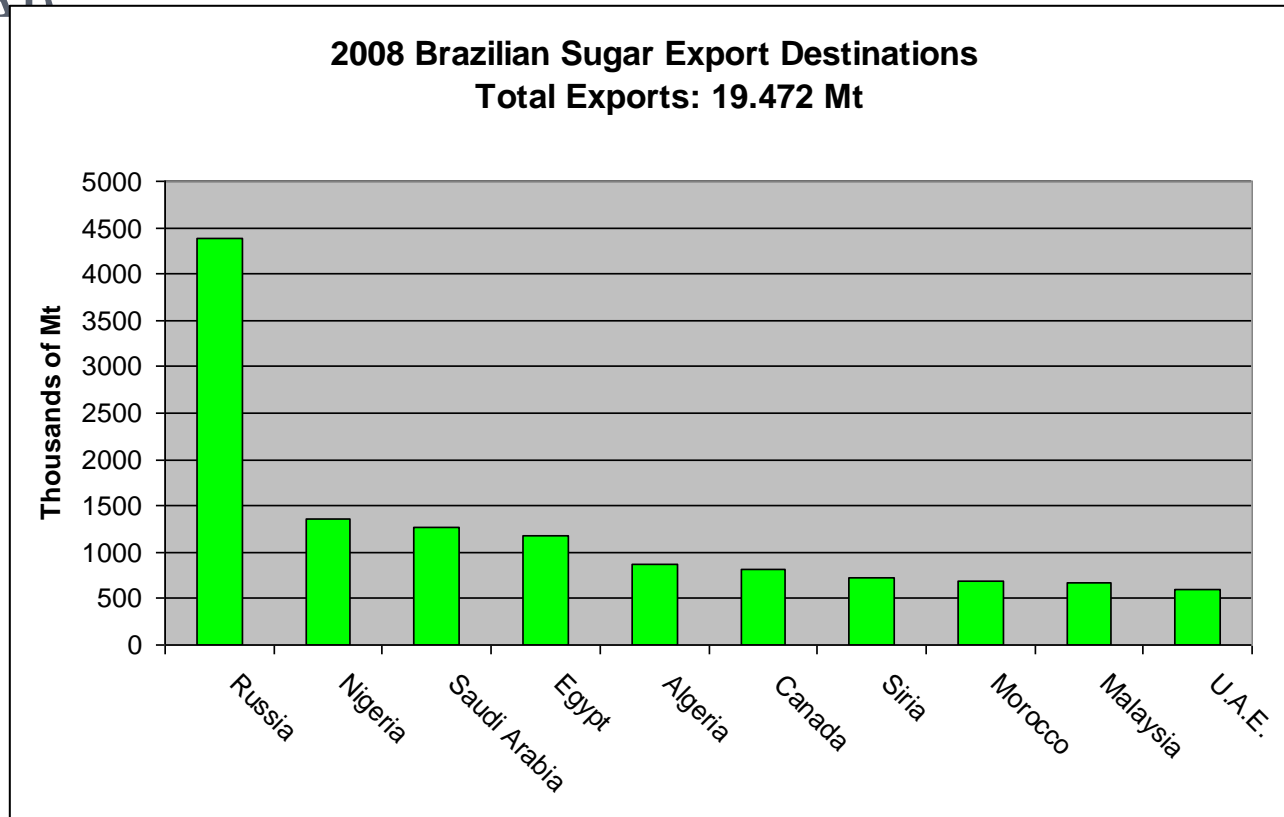
- Among major producers, only Brazil has shown a year on year increase in exports this year.

# MAIN WORLD SUGAR EXPORTERS – RAW SUGAR

- **Expected volumes and YoY change in the next crop.**
- **Brazil 2009/2010 21.5 Mi mt (plus 9%)**
- **Thailand 2008/2009 4.75 (minus 5%)**
- **Australia 2009/2010 3.6 Mi (minus 2.7%)**
- **Guatemala 2008/2009 1.6 mt even**
- **India 2008/2009 1.2 Mi mt (minus 70%)**
- **Middle East Countries 2008/2009 3.87\* Mi mt (plus 7.42%)**
  - **\*refined sugar**



# EXPORT DESTINATIONS FOR BRAZILIAN SUGAR



US imports only 230 thousand mt of raw sugar from Brazil under their regulated quote system and the EU will import only from the countries included in the EBA program ("Everything *But Arms*"). Difficult to understand why Brazil is out of this program. All 3 Brazilian nuclear power plants, almost all weapons, airplanes, war vessels, etc, in the last 50 years were bought from EU countries!

# BRAZILIAN REGIONAL PRODUCTION

**Brazilian production of sugarcane, sugar and ethanol (2007/2008\*)**

REGION/STATE **	SUGARCANE PRODUCTION (million tonnes)	% OF TOTAL	SUGAR PRODUCTION (million tonnes)	ETHANOL PRODUCTION (billion litres)
<b>Southeast</b>	<b>335.9</b>	<b>69.0%</b>	<b>21.5</b>	<b>15.2</b>
São Paulo (SP)	295.0	60.6%	19.1	13.5
Minas Gerais (MG)	35.6	7.3%	2.1	1.8
<b>Centerwest</b>	<b>50.6</b>	<b>10.4%</b>	<b>2.1</b>	<b>3.0</b>
Goiás (GO)	20.8	4.3%	1.0	1.2
Mato Grosso (MT)	14.9	3.1%	0.5	0.9
Mato Grosso do Sul (MS)	14.8	3.0%	0.6	0.9
<b>Northeast</b>	<b>58.7</b>	<b>12.0%</b>	<b>4.4</b>	<b>1.9</b>
Alagoas (AL)	24.7	5.1%	2.2	0.7
Pernambuco (PE)	17.1	3.5%	1.6	0.4
<b>South</b>	<b>40.5</b>	<b>8.3%</b>	<b>2.5</b>	<b>1.9</b>
Paraná (PR)	40.4	8.3%	2.5	1.9
<b>North</b>	<b>1.3</b>	<b>0.3%</b>	<b>0.1</b>	<b>0.1</b>
<b>Total</b>	<b>487.0</b>	<b>100%</b>	<b>30.6</b>	<b>22.0</b>

**Notes:** \*estimated data as of january/2008; \*\*only states with more than 10 million tonnes are considered; Southeast = SP, MG, ES and RJ; Centerwest = GO, MT, MS and DF; Northeast = PE, AL, SE, BA, PI, CE, RN, PB and MA; South = PR, SC and RS; North = AC, AM, RR, PA, AP, AM and TO.

**Sources:** Unica (2008) and Mapa (2008). **Data compiled** by Unica.



# SUGAR

Margins for sugar production in Brazil have been 15-18% over the last 10 years. But heavy debts are leaving some mills unable to pay growers.

Factors helping Brazilian sugar producers:

Increased international demand

Strong domestic market

Lowest costs of production

Dropping Freight Rates

London, Dec 24, 2008 - The global economic crisis is set to curtail the expansion of the sugar market with many Brazilian mills struggling to repay debts, Czarnikow trading firm said. "The global financial crisis has had a clear short-term impact on the market, but in the longer-run the lack of funding will curtail the pace of expansion."

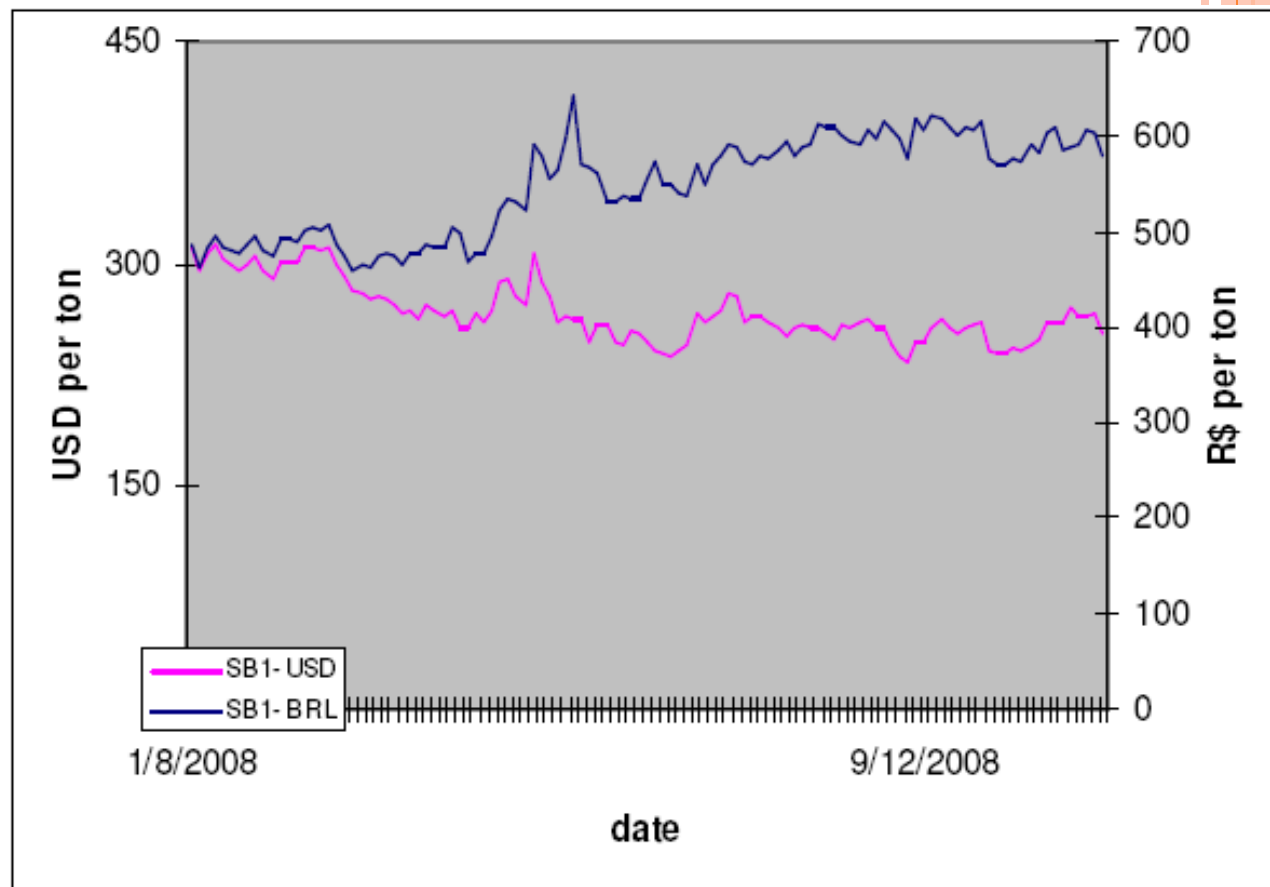


# LOGISTICS

- Sugar is made in a variety of forms for domestic consumption and export.
- The location of the majority of the mills close to the major markets and ports reduces the freight cost of the finished products.
- Dropping freight rates are making Brazilian sugar more attractive especially to the Middle East and Asian markets like China, Indonesia, and India



Despite recent price declines in New York and London, the strong depreciation of the Brazilian currency has more than offset the drop in dollar terms leaving local sugar prices nearly 20% higher.



# ETHANOL



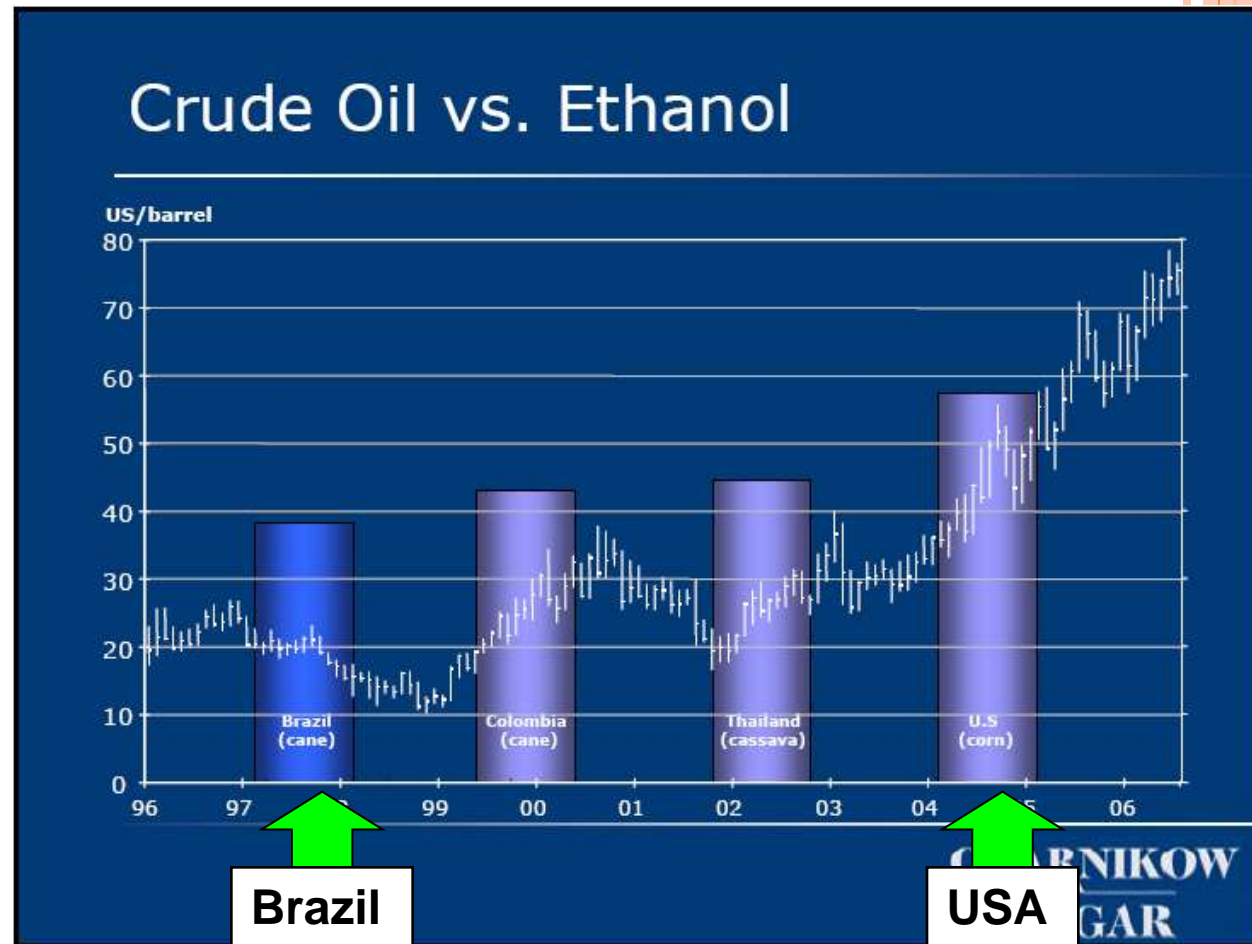
- The EU with a 10% ethanol mandate for 2012 is an important potential consumer of Brazilian ethanol.
- The US has a 54 cent per gallon tariff on ethanol imports. A reduction in this barrier would have a significant impact on the ethanol market.



# WORLD LOW COST PRODUCER OF ETHANOL

**Brazilian ethanol can compete with oil prices as low as \$40 per barrel...**

Sugar-cane based ethanol has been refined for years in Brazil, and enjoys a significant cost advantage over other sources of ethanol. In fact, Brazilian ethanol is 40% cheaper to make than in the U.S. and can be produced for less than half the price of European ethanol.

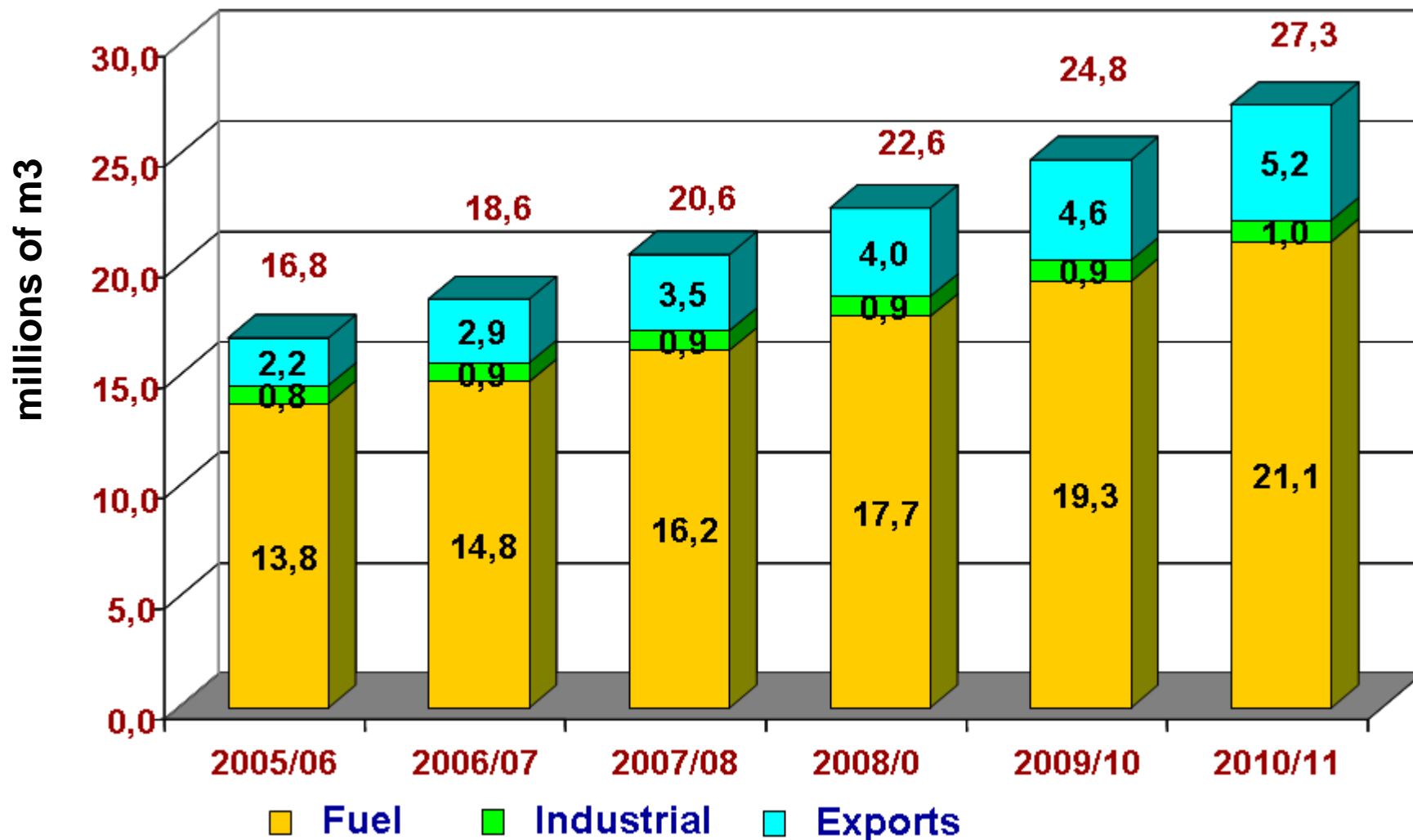


# BRAZILIAN ETHANOL

- World's low cost producer.
- Largest exporter in world.
- Large established domestic market.
- Cane yields 800 to 850 gallons (3,000 to 3,000 liters) of ethanol an acre, more than twice as much as corn.
- Another distinction which is of importance in the field of ethanol is the one between anhydrous and hydrous alcohol. Anhydrous alcohol is free of water and at least 99% pure. This ethanol may be used in fuel blends. Hydrous alcohol on the other hand contains some water and usually has a purity of 96%. In Brazil, this ethanol is being used as a 100% gasoline substitute in cars with dedicated engines. The distinction between anhydrous and hydrous alcohol is of relevance not only in the fuel sector but may be regarded as the basic quality distinction in the ethanol market.



# COPERSUCAR'S SCENARIO FOR BRAZILIAN ETHANOL DEMAND



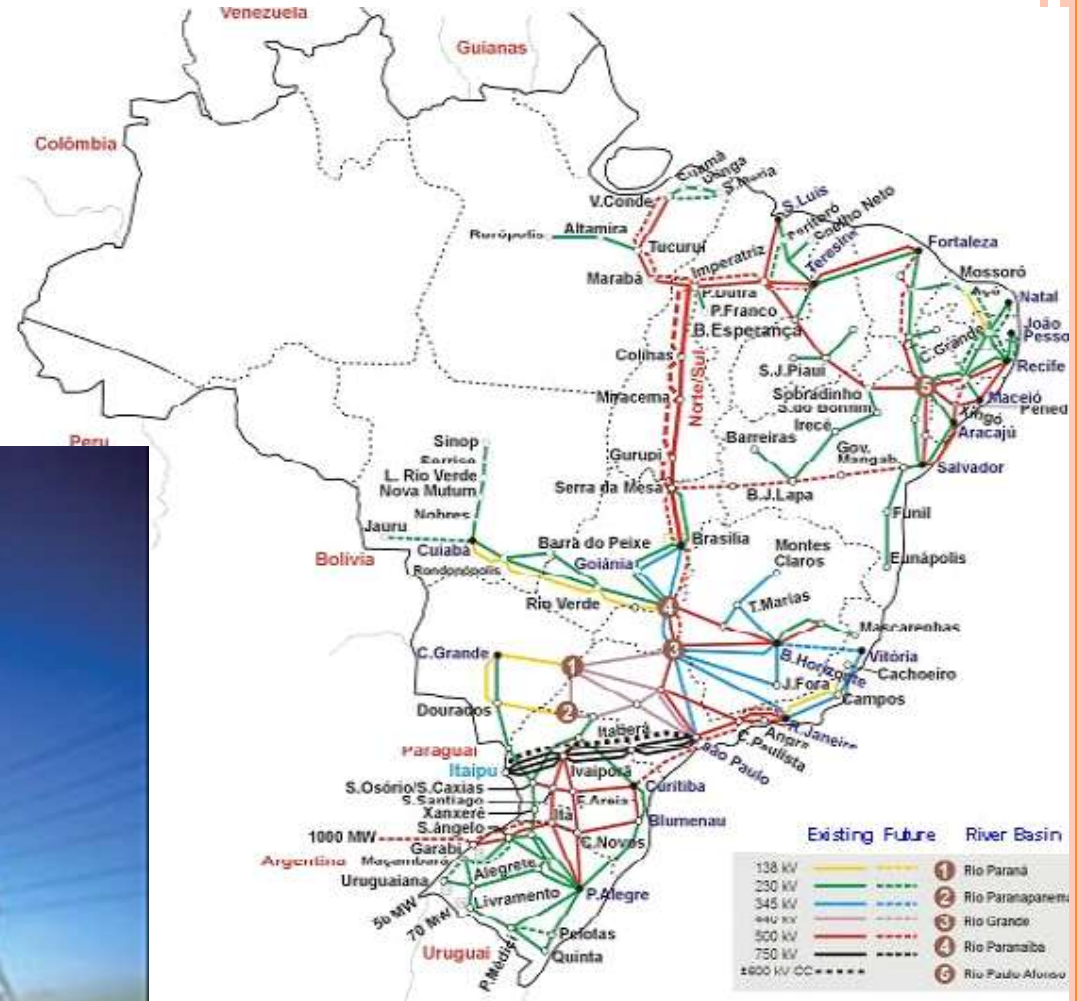
# REPLACING GAS WITH ETHANOL

- Ethanol outsold gasoline in Brazil in 2008 for the first time ever.
- This is a milestone because it means that using 2% of Brazil's arable land, the country managed to replace over 50% of their gasoline sales, and still have \$6.5 Billion in exports of sugar and ethanol left over.
- In the US production of ethanol soared 32% to 6.5 billion gallons in 2007.
- Several ethanol pipelines are planned to assist in moving the product to ports, which is currently done primarily by truck.
- Did you know that Henry Ford's Model-T ran on ethanol?





# ELECTRICITY



# ELECTRICITY FROM BAGASS

- Bioelectricity may well be the most significant new area of activity for Brazil's sugarcane industry.
- Sugar mills generate electricity by burning bagass, the dry, fibrous waste that is left over after sugarcane has been processed
- The cost to produce surplus electricity is the cost of buying more efficient boilers bioelectricity is competitive in price!

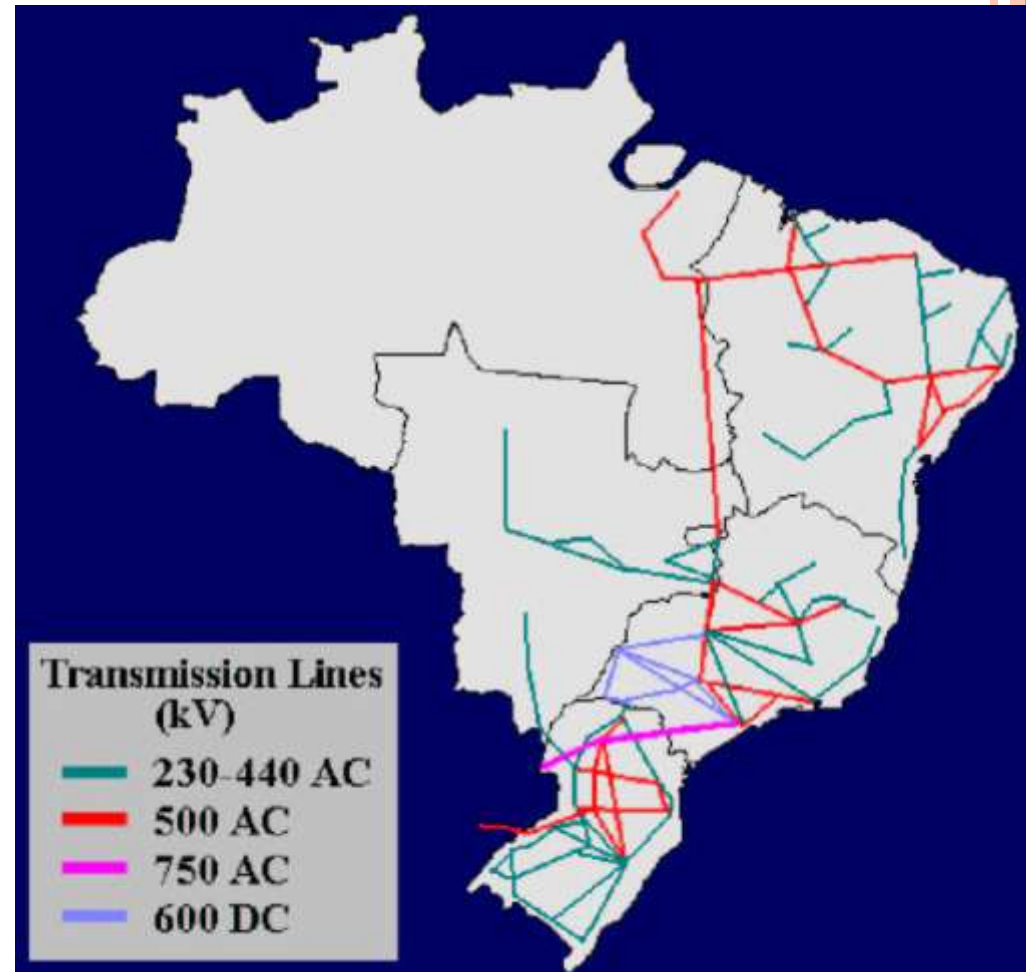


- 84% of Brazil's total electricity generation is hydro. An important benefit is that electricity generated from sugarcane is produced in the dry season when hydro electric potential is lowest.



# THE BRAZILIAN POWER GRID

- Currently, only 48 mills out of 405 sell electricity to the grid and/or other private companies.
- According to the Sugar and Alcohol Millers Association of Sao Paulo State (UNICA), the current net profit margin from cogen is around 15%.
- It can be expensive to construct the infrastructure to connect a mill to the grid. That's why the electricity distributors are interested and recently tendered bids for the improvement of the grid in the growing sugar production states of Goiás and Mato Grosso do Sul



# BIGGER IS BETTER...

- Only mills with over 2.5 million tons of cane crushing capacity have the scale required to enable them to hook up and sell excess power efficiently to the national grid. Though it can be costly to do, this adds a crucial third leg to the income potential of the mill.
- Cosan, Brazil's largest sugar and ethanol company received 6% of their income last year from cogeneration.
- Harvest period coincides with dry hydrological season adding additional economic value, because it is produced when spot prices are higher
- Mills are located near major load centers = lower transmission costs
- Construction time: 18 months
- – Contrast with five or more years for hydro
- – Flexibility is valuable because of volatility in load growth



# MILLS



# INVESTMENT IN CAPACITY

- In 2005, Brazil had 320 sugar mills, in 2006, this number had risen to 330. Today there are 403, and 120 more are approved to be built by the year 2015.
- Moreover, some existing mills have expanded to almost twice their size , such as in the case of the Moema Sugar Mill, which grew from under 86,000 acres to now cover 173,000 acres of land and produce 880,000 tons of sugar and 185 million gallons of ethanol yearly.
- Mills with over 3.5 million tons of capacity begin to require duplication of some of the most capital intensive structures and thus start to lose their economies of scale.
- The US as well has seen a dramatic expansion in refineries.



# MILL ACQUISITION COSTS

## ○ Mill costs:

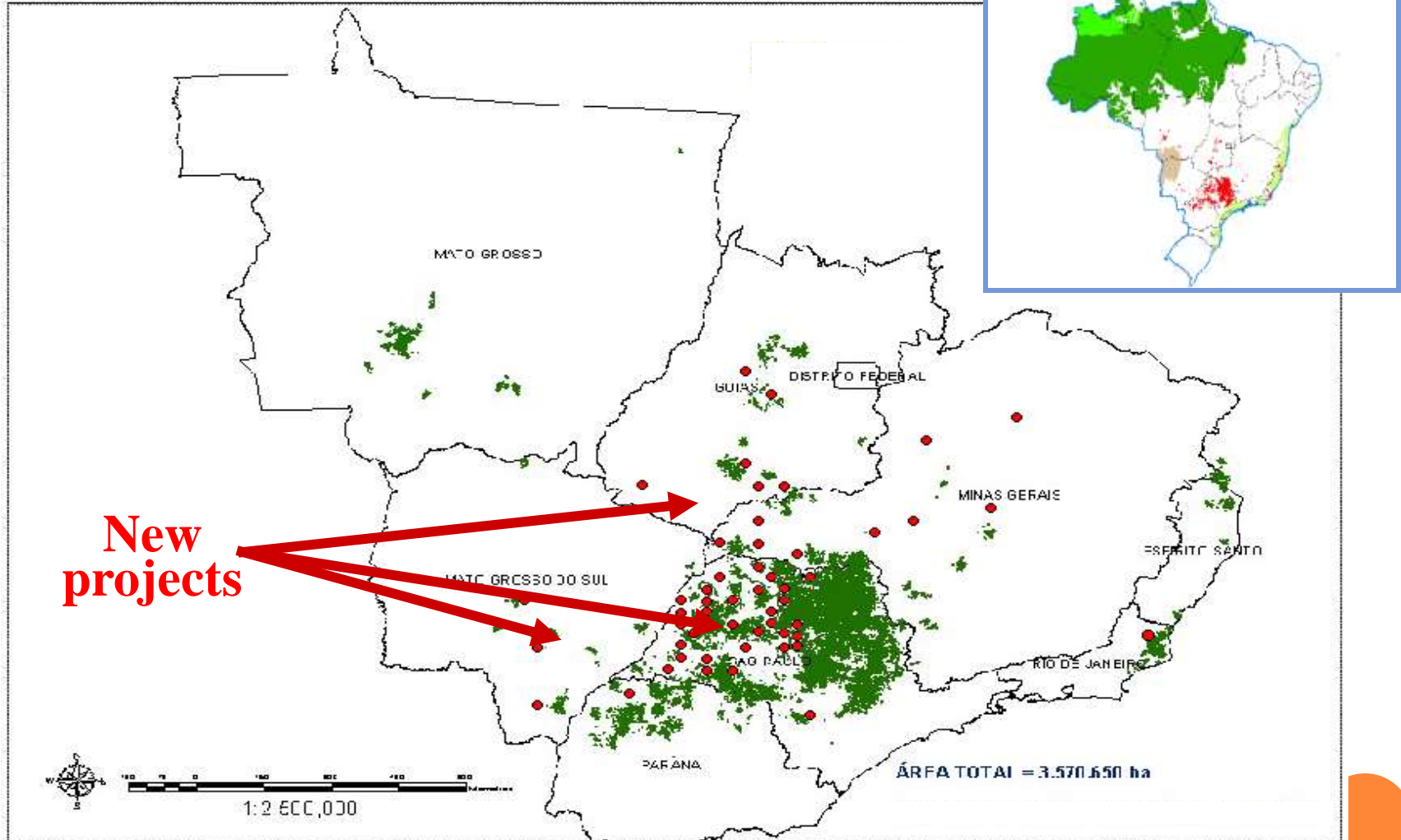
- New Mill: \$80 - \$90 / Mt  
3M mt: \$250 million

- Existing Mill: \$50 - \$60 / Mt  
3M mt: \$165 million

- Current Margins:
- Sugar 15 - 18%
- Ethanol 0 - 3%
- Energy 10%



# EXPANSION OF THE SUGAR AND ETHANOL INDUSTRY



# SELECTED INVESTMENTS IN BRAZIL'S SUGAR AND ETHANOL SECTOR

- Nov 2007 Agri-giant **Bunge** is making its first entry into the sugar and sugar-derived ethanol market with an agreement to acquire a sugar mill and ethanol production facility in Brazil
- Jun 2008 **Noble Group**, Hong Kong-based commodities trading company, will invest US\$ 300 million to build a new sugar and ethanol mill in Sao Paulo state, with a crushing capacity of eight million tons per year.
- Jul 2008 Grupo Cabrera in Brazil, announced that American company, **Archer Daniels Midland Co** (ADM), are investing US\$500 million into a joint ethanol venture with them.
- July 2008 Brazilian conglomerate **Odebrecht's** energy unit ETH Bioenergia said it plans to spend 5 billion reais (\$2 billion) by 2015 adding processing capacity and may sell shares to the public to finance expansion.
- Aug 2008 **Louis Dreyfus Commodities** LDC Bioenergia, recently invested \$433 million in a new sugar mill and ethanol production plant
- Nov 2008 Sao Paulo-based **Vital Renewable Energy Company (VREC)** announced that it has secured over \$1bn (£680m) to be invested in ethanol production and electricity generation
- December 2008 **ETH Bioenergia**, has received a \$463 million loan to build three ethanol mills in the area. Each mill will be able to annually crush 2 million tons of sugarcane in 2009 with plans to expand to 5 million ton capability.
- Dec 2008 **Royal Dutch Shell PLC** (RDSB.LN) is studying a possible minority partnership with Brazil's largest sugar and ethanol group, Cosan, in an ethanol mill in Brazil's central-west state of Goias
- Dec 2008 State-run **Indian Oil Corp** announced plans to buy a sugar mill and set up a refinery in Brazil to produce ethanol

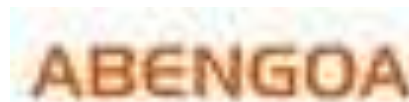


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# OTHER PLAYERS IN THE MARKET

- BP
- Goldman Sachs
- Dow
- Mitsui
- Tereos
- Sucden
- Béghin Say
- Itochu
- ED&F Man
- Abengoa



# SÃO PAULO SUSPENDS NEW MILL CONSTRUCTION

- There is one small fly in the ointment however, and that is the news that the state of Sao Paulo, where the bulk of Brazil's sugar growing and milling takes place has suspended licenses effective May 16, 2008 for new mills and refineries pending investigations into the environmental impact that they are likely to have.



### Income:

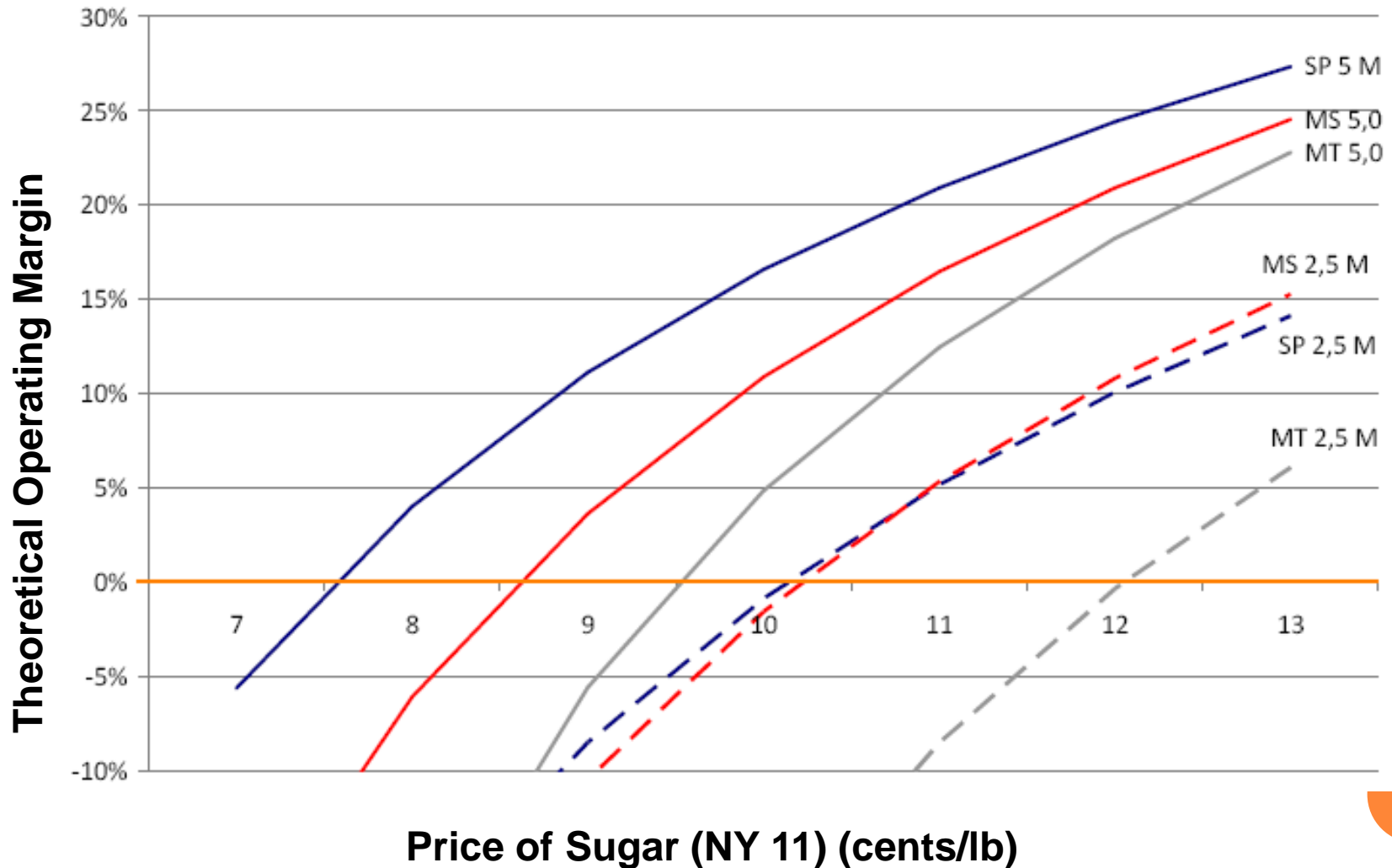
- A set 50/50 mix of sugar and ethanol
- Energy sales for mills over 2.5 million tons

### Costs:

- transport of finished product
- freight costs for transporting raw materials
- cost of renting the land
- cost of buying the cane
- industrial costs of running the mill
- administrative costs.



# BREAK EVEN CURVES OF MILLS BY SIZE AND REGION



# MILL PARTNER CONSIDERATIONS

- Scale
  - Mills with less than 2.5 million tons of crushing capacity are unable to co-generate electricity efficiently, and only 20% of the mills with this capacity are independent
- Geography
  - Finding an existing operation with zoning for expansion, near infrastructure, and with access to nearby markets. Also many mills that are built outside of existing code making transfer or sale difficult.
- Technology
  - Cost effective facilities and modern farming area
- Debt
  - In some cases today, debt levels exceed purchase price of the assets
- Partners
  - Labor, accountants, and membership in local cooperatives can often make the difference in survival of the mill.



## LISTED COMPANIES.

- What can we learn from the reports and share prices of the three locally listed companies in the sugar and ethanol business? The three have been among the worst performers on the market this year, down an average of 55% in the last 3 months.



"Cosan always grew in crisis,"

chief operating officer, Pedro Mizutani

# LISTED COMPANIES

	Mkt cap \$MM	crushing capacity M mt	\$/tn of crushing capacity
	\$1,265.32	40.0	\$31.63
	\$497.62	11.8	\$42.17
	\$142.38	11.1	\$12.83

If you take Cosan's current share price, they do not reach one quarter of their reported assets, investors are confused about the companies' prices, and unsure about the availability of future funding.



# PROS FOR INVESTING IN MARKET

- Strong and growing national demand for ethanol and electricity.
- Potential demand for renewable energy in the world market and a constant world demand for sugar
- Cheap and productive land available for sugarcane.
- No known commodity produced in the world is likely to supplant sugarcane in the efficiency and profitability for the production of ethanol.
- With Brazil's available land and climate no country is expected to challenge its eventual dominance in the quantity and profitability of ethanol production.
- Sugarcane is a net-energy positive plant species creating more energy than required during its industrial process. This fact creates low operational costs and a co-product, energy.
- Untapped technological advances exist on both the agricultural production side as well as with sugarcane industrial processing that should substantially increase margins and profitability.



# OPPORTUNITIES

- 5 years of debt fueled expansion and building of capacity has left many players in the market overleveraged and facing an environment of very tight credit and lower prices. As the investor appetite for the sector cools, prices are coming down and are beginning to match the potentials of the market.
- Corn based ethanol production in the US is reliant on government subsidy. It is currently impossible for corn to compete with sugarcane in the production of ethanol by nearly any metric.
- Sugarcane is not directly connected with the food vs. fuel debate thus positioning sugarcane ethanol especially in Brazil for even greater market share.
- Opportunities for investment in sugarcane are not limited only to land acquisition, electrical energy production, and product diversity. Investments in technology, agricultural machinery and infrastructure, agricultural inputs and new advanced processing technology and controls are all expected to provide good returns.



## CONS AGAINST INVESTING IN MARKET

- Capital and debt in Brazil is expensive. International crisis makes raising start-up capital difficult.
- Long lead time for greenfields. Need to invest in the purchase or leasing of land and initiate feedstock production up to three years in advance of initiating processing and cash flow. This is in sharp contrast to the corn based ethanol industry in the U.S. In the U.S. there is a surplus of corn available so US plants can go to immediate full capacity generating cash flow and profits quickly.
- Low national level of investment in new technologies and infrastructure.



# THREATS

- A large percentage of the sugarcane production in Brazil occurs in a concentrated area in the South East. Adverse climactic conditions occurring in this area or crop failure due to disease or other local factors could impact 80% of the country's production.
- Availability of resources: material to build processing industries, a lack of qualified personnel, and the development of needed infrastructure to transport outputs to market.
- Socio-cultural, economic and political issues that may slow progress. Ethanol is a very politically charged issue and will be impacted both positively and negatively by politicians.
- Competition: Recent expansion has been strong, and has attracted many new players who are well capitalized, experienced and well placed to extract value from the market.
- A further degree of uncertainty is added by the fact that most producers could easily switch from ethanol to sugar production. If this swing ratio, leads to supply disruptions, it may have a severe impact on public confidence in the ethanol industry.



# PURCHASE ANALYSIS

	PROS	CONS
Greenfield	<ul style="list-style-type: none"> <li>• Modern mill done to exact requirements</li> </ul>	<ul style="list-style-type: none"> <li>• High initial CapEx</li> <li>• Execution Risk</li> <li>• Prime locations mostly taken</li> <li>• Long lead time</li> </ul>
Existing Mill	<ul style="list-style-type: none"> <li>• No startup delay</li> <li>• Known history</li> <li>• High debt loads leave several mills available</li> </ul>	<ul style="list-style-type: none"> <li>• Many existing mills have legacy issues</li> <li>• May lack current technology</li> <li>• May face competition for cane in crowded areas</li> </ul>
Large Groups	<ul style="list-style-type: none"> <li>• Large Scale</li> <li>• Consolidated infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Shareholder issues</li> <li>• Either large financial commitment or remain a minority partner</li> </ul>

# FINANCIAL ANALYSIS OF MILL OWNERSHIP

NB Maintenance and General overhead included in the production costs

Operating Margins		1	2	3	4	5	6	7	8	9	10
Sugar Production (c/lb) FOB		(38,974)	(38,974)	(38,974)	(38,974)	(38,974)	(38,974)	(38,974)	(38,974)	(38,974)	(38,974)
Ethanol Production (\$/m3) ExFactory		(41,176)	(41,176)	(41,176)	(41,176)	(41,176)	(41,176)	(41,176)	(41,176)	(41,176)	(41,176)
Electricity \$/yr (maintenance)		(1,000)	(1,000)	(1,000)	(1,000)	(1,000)	(1,000)	(1,000)	(1,000)	(1,000)	(1,000)
Total Costs		(81,149)	(81,149)	(81,149)	(81,149)	(81,149)	(81,149)	(81,149)	(81,149)	(81,149)	(81,149)
<b>Income</b>											
Sugar c/lb	12	45,822	45,822	45,822	45,822	45,822	45,822	45,822	45,822	45,822	45,822
Ethanol \$/m3	753	42,356	42,356	42,356	42,356	42,356	42,356	42,356	42,356	42,356	42,356
Electricity \$/MWhr	62.5	12,960	12,960	12,960	12,960	12,960	12,960	12,960	12,960	12,960	12,960
Others		3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
TOTAL Income		104,138	104,138	104,138	104,138	104,138	104,138	104,138	104,138	104,138	104,138
EBITDA		22,989	22,989	22,989	22,989	22,989	22,989	22,989	22,989	22,989	22,989
Operating Margin		28.33%									
CapEx for Mill		(255,000)									
Depreciation		(12,750)	(12,750)	(12,750)	(12,750)	(12,750)	(12,750)	(12,750)	(12,750)	(12,750)	(12,750)
Net Assets		255,000	242,250	229,500	216,750	204,000	191,250	178,500	165,750	153,000	140,250
Total Working Capital Required		20,009									
10 year average ROE		12.96%	ROE	9.49%	10.02%	10.61%	11.27%	12.02%	12.88%	13.87%	15.03%
10 year average ROCE		11.60%	ROCE	8.77%	9.21%	9.71%	10.26%	10.88%	11.58%	12.38%	13.29%
											14.34%
											15.58%

Basic simulation for the expected mill cashflow using current prices. Overheads, and maintenance have been incorporated into the production costs of the sugar, ethanol, and electricity, and freight costs are based on a well positioned São Paulo mill. Prices are in (US\$ 000s)

# OPERATING MARGINS

NB Maintenance and General overhead included in the production costs

Operating Margins		1	
Sugar Production (c/Lb) FOB		(38,974)	
Ethanol Production (\$/m3) ExFactory		(41,176)	
Electricity \$/yr (maintenance)		(1,000)	
Total Costs		(81,149)	
<b>Income</b>			
Sugar c/lb	12	45,822	
Ethanol \$/m3	753	42,356	
Electricity \$/MWhr	62.5	12,960	
Others		3,000	
TOTAL Income		104,138	
EBITDA		22,989	
Operating Margin	28.33%		
CapEx for Mill	(255,000)		
Depreciation		(12,750)	
Net Assets	255,000	242,250	
Total Working Capital Required	20,009		
10 year average ROE	12.96%	ROE	9.49%
10 year average ROCE	11.60%	ROCE	8.77%

- • Here is a simple mill simulation
- where we have taken today's
- prices for inputs and outputs and
- come up with an expected first
- year cashflow analysis.
- • This is a mill using 50% of its
- cane for sugar production and
- 50% for ethanol production
- • Current Margins for
- Sugar are 17.6%
- for Ethanol 2.9%
- • Our mill turns out an operating
- margin of 28.33% before interest
- taxes and depreciation



# THE POWER OF THE “SWING”

NB Maintenance and General overhead included in the production costs

Operating Margins		2
Sugar Production (c/Lb) FOB		(58,461)
Ethanol Production (\$/m3) ExFactory		(20,588)
Electricity \$/yr (maintenance)		(1,000)
<b>Total Costs</b>		<b>(80,048)</b>
<b>Income</b>		
Sugar c/lb	12	68,732
Ethanol \$/m3	753	21,178
Electricity \$/MWhr	62.5	12,960
Others		3,000
<b>TOTAL Income</b>		<b>105,871</b>
<b>EBITDA</b>		<b>25,822</b>
Operating Margin	32.26%	
CapEx for Mill	(255,000)	
Depreciation		(12,750)
<b>Net Assets</b>	<b>255,000</b>	<b>242,250</b>
<b>Total Working Capital Required</b>	<b>19,738</b>	
10 year average ROE	14.56%	ROE 10.66%
10 year average ROCE	13.05%	ROCE 9.86%

What you can see is that having the ability to “swing” the mill to produce a greater volume of the higher margin product (in this case sugar) we give ourselves a much better margin (32.26% vs 28.33%)



# SUMMARY AND CONCLUSIONS

The international market for sugar and ethanol is currently facing a period of uncertainty. After 5 years of extraordinary growth and investment fueled by high oil and cheap credit, the market now faces a sharp reversal of both. Many players in Brazil are facing the prospect of having to roll over billions in debt in an environment that is making that ever harder to do. Furthermore, the high prices for oil faced by the world economy in the last few years was a boon for ethanol producers and no other country in the world makes ethanol cheaper than Brazil, but with the price of crude hovering below \$50 per barrel the appetite for alternative fuels is in decline.

And yet the relatively recent addition of power cogeneration sales and the possibility of a return to higher gas and ethanol prices has led almost every international trading house to invest in the Brazilian sugar and ethanol industry. If stock market valuations are anything to go on, these investments are currently worth far less the prices that were paid. But might not now be an excellent time to consider entering the market? Prices are low, the business cycle has swung back down, and there is unlimited potential for growth in the coming years. Besides the three pillars of direct income to be generated from the output of the mills, there are trading opportunities for a firm with scale and reach.

# IN BRAZIL YOU CAN HAVE YOUR CANE...

... And eat it



... And drive it



... And plug it



... SAÚDE!\*\*

\*\* Means "cheers", in Portuguese - the drink is *caipirinha*, Brazil's most popular drink. It is made of ethanol (the same stuff we put in cars), sugar, lime and crushed ice

... And fly it\*



\*Airplane with ethanol engine developed by Embraer - chosen by Scientific American magazine as one of the 50 highlights of world science + technology in 2005

# SOURCES

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# END OF PRESENTATION

Arthur Ware

[arthur@arthurware.com](mailto:arthur@arthurware.com)











