USDA Foreign Agricultural Service
GAIN Report
Global Agriculture Information Network
Template Version 2.09

Required Report - public distribution

Date: 7/20/2007

GAIN Report Number: BR7011

Brazil

Bio-Fuels

Annual - Ethanol

2007

Approved by:
Elizabeth Autry, Agricultural Attaché
Office of Agricultural Affairs, Brasilia

Prepared by:
Sergio Barros, Agricultural Specialist
U.S. Agricultural Trade Office, Sao Paulo

Report Highlights:
This reports updates BR6008 and BR7003

Includes PSD Changes: No
Includes Trade Matrix: No
Unscheduled Report
Sao Paulo [BR3]
[BR]

Table of Contents

The Brazilian Energy Matrix

As reported by the Ministry of Mines and Energy (MME), the domestic supply of energy in 2006 was 225.8 million metric tons petroleum equivalent (tpe), a 3.2 percent increase compared to 2005 (218.7 million tpe).

Brazil is the worldwide leader in the supply of energy from renewable sources. This source of energy increased 4.2 percent in 2006 and represents almost 45 percent (101.5 million tpe) of total Brazilian energy supply, whereas the global average energy supply from renewable sources is 13.2 percent of domestic energy. The supply of energy from sugarcane in 2006 represented 14.6 percent (33 million tpe) of total supply, a 9.6 percent increase compared to 2005. The table below shows the Brazilian energy supply, according to MME.

Brazilian Energy Supply (million TPE)

	2005	2006	2006 (%)	Annual Increase (%)
Non-Renewable Energy	121.349	124.320	55.1%	2.4%
Petroleum and derivatives	84.553	85.485	37.9%	1.1%
Natural Gas	20.526	21.721	9.6%	5.8%
Mineral Coal and derivatives	13.721	13.464	6.0%	-1.9%
Uranium (U_3O_8) and derivatives	2.549	3.650	1.6%	43.2%
Renewable Energy	97.314	101.433	44.9%	4.2%
Hydraulic and Electric Energy	32.379	33.452	14.8%	3.3%
Log Wood and Vegetal Coal	28.468	28.058	12.4%	-1.4%
Sugarcane products	*30.147*	*33.043*	*14.6%*	*9.6%*
Other Renewable sources	6.320	6.880	3.0%	8.9%
Total Energy Supply	218.663	225.753	100.0%	3.2%

Source: National Energy Balance, 2007. TPE = Ton Petroleum Equivalent.

MME also reports that the total domestic energy consumption was 202.5 million tpe, including 76.5 million tpe (37.7 percent) for industrial use and 53.6 million tpe (26.5 percent) for transportation.

Electric Energy Matrix

In spite of the supremacy of hydroelectric power in the total electric energy supply matrix (almost 85 percent of total supply in 2006, including imports), biomass is advancing and currently represents 3.3 percent of total supply, an 8 percent increase compared to 2005. Sugarcane products generated 70 to 80 percent of the biomass used to generate electricity. The following table shows the electric energy supply matrix, according to MME.

Electritc Energy Supply Matrix (GigaWatt-hour - GWh)

Source	2005	2006	Annual Increase (%)
Hydroelectric	337.457	347.820	3,07%
Nuclear	9.855	13.769	39,72%
Natural Gas	18.811	18.547	-1,40%
Mineral Coal	6.863	8.500	23,85%
Petroleum Derivatives	11.722	10.888	-7,11%
Biomass 1/	14.042	15.211	8,33%
Industrial Gas	4.188	3.741	-10,67%
Imports	39.042	41.155	5,41%
Total	**441.980**	**459.631**	**3,99%**

Source: MME, Balanco Energetico Nacional, 2007

1/ Includes 60 and 236 GWh of eolic energy in 2005 and 2006, respectively.

Energy from Biomass (Sugarcane)

According to Nastari (2000)[1], 1,000 metric tons (mt) of sugarcane contains 55.11 tpe from sucrose, 56.43 tpe from bagass and 55.05 tpe from tops and leaves. In other words, approximately one-third of the sugarcane energy content is originated from the bagass and an additional one-third from the tops and leaves. Brazilian companies have been developing technology to co-generate energy from bagass, since the product is harvested and hauled to the mill as part of the sugar-ethanol production process, whereas the use of tops and leaves is still restricted by the cost of collecting these materials from the fields.

Current technology (boilers with medium pressure) allows Brazil to co-generate approximately 15 Mega Watt-hour (MWh) per million metric ton (mmt) of sugarcane during 5,000 hours (the average length of the crop season), which totals 75,000 MWh per mmt. The income is equivalent to R$ 10.5 million/mmt of sugarcane at current average prices (R$ 130-145/MWh).

The burning of the sugarcane bagass co-generates electrical energy, which makes all sugar-ethanol mills self-sufficient in energy. As reported by the Sugar and Alcohol Millers Association of São Paulo State (UNICA) and the State of Sao Paulo Cogeneration Association (COGEN-SP), the installed capacity in the state of Sao Paulo, the largest producing state, is 2,800 MW and the self-consumption is estimated at 2,200 MW. About 600 MW of energy are sold to the energy grid (500 MW sold by mills in the state of Sao Palulo).

“Energias do Brasil” reports that an additional 2,745 MW can be introduced to the energy matrix by 2012 if sugarcane production expands by an extra 300 million metric tons and more efficient boilers are added to the system. The co-generation cost is the additional investment in larger and more efficient boilers. The advantages in co-generating energy from biomass compared to other sources include: the ease of getting environmental licensing compared to hydroelectric; construction takes approximately 2 years, as opposed to

[1] Natari, P.M. “O Uso de Cana de Acucar para fins energéticos no Brasil”, seminario Internacional Porrugal – Brasil sobre Energia, Associacao Portuguesa de Energia e Comite Brasileiro do Conselho Mundial de Energia, March 28-28, 2000 Lisbon, Portugal.

hydroelectric plants, which take 5 years; and plants are located close to main load centers, reducing transmission costs.

The operational cost to co-generate energy from sugarcane varies between R$ 50 and 100 /MWh from December to April during the off-season of the sugarcane crop and from R$ 100 to 200/MWh during the 7 months of the harvest season when bioelectricity is produced. Current average prices are R$ 130-145/MWh.

Brazilian Ethanol Production, Supply and Demand of Ethanol (PS&D Table)

The table below shows the Brazilian Ethanol PS&D since Marketing Year (MY) 2003/04. Figures are reported in marketing years (May-April), to be consistent with the Brazilian official sugarcane crop year and other reports already produced by post. Note that trade numbers are reported in both marketing and calendar years.

While the Agricultural Trade Office (ATO)/Sao Paulo and many other institutions continue to refer to a May-April marketing year for sugarcane, harvesting actually begins as early as mid-March in the far south and mid-April (weather permitting) in Sao Paulo state. As a result, over the past two years approximately five percent of the Center-South sugarcane crop has been crushed and entered consumption channels *prior to* the beginning of the marketing year. One consequence is the apparent contradiction of negative ending stocks for 2006/07, as part of the 2007/08 crop was consumed in 2006/07.

Brazilian Ethanol Production, Supply and Demand (May-April, Million Liters)

	MY 03/04	MY 04/05	MY 05/06	MY 06/07	MY 07/08 *
Ethanol Beginning Stocks	200.0	1,348.0	685.0	50.0	-135.0
Ethanol Production	14,798.0	15,397.0	15,800.0	17,860.0	20,450.0
Anhydrous	8,896.0	8,310.0	8,020.0	8,225.0	8,600.0
Hidrated	5,902.0	7,087.0	7,780.0	9,635.0	11,850.0
Ethanol Imports - MY	2.0	0.3	0.2	3.8	5.0
Ethanol Imports - CY	6.1	0.4	0.2	0.1	5.0
Total Ethanol Supply	15,000.0	16,745.3	16,485.2	17,913.8	20,320.0
Ethanol Domestic Demand (all uses)	12,602.0	13,460.3	13,835.2	14,203.8	17,055.0
Ethanol Exports - MY	1,050.0	2,600.0	2,600.0	3,845.0	3,000.0
Ethanol Exports - CY	749.6	2,383.6	2,592.3	3,428.9	3,000.0
Ethanol Ending Stocks	1,348.0	685.0	50.0	-135.0	265.0
Total Utilization	15,000.0	16,745.3	16,485.2	17,913.8	20,320.0

Source: USDA/FAS/ATO/Sao Paulo. Note: Marketing Year (MY) is May - April. * Forecast.

Production

Sugarcane is the sole source of feedstock for ethanol production in Brazil. ATO/Sao Paulo forecasts total MY 2007/08 sugarcane production at 478 mmt, up 50 mmt relative to MY 2006/07. The harvest began in March in the Center-South and is expected to be completed in December. The crushing season for the North-Northeastern states is expected to start in August and September and to end in February. Please refer to BR7003 for a complete overview of sugarcane production.

The MY 2007/08 sugarcane crop is expected to divert more sugarcane toward ethanol production and away from sugar production as a consequence of higher demand for ethanol in the domestic market and less attractive sugar prices in the international market. Total sucrose (total reducing sugar, TRS) content for sugar and ethanol production is projected at 47.4 and 52.6 percent, respectively, compared to 49.5 and 50.5 percent for the previous crop. The table below shows sugarcane use for ethanol production for MY 2003/04 through 2007/08.

Quantity of Feedstock Use in Ethanol Production (000 MT)

	MY 03/04	MY 04/05	MY 05/06	MY 06/07	MY 07/08 *
Sugarcane Production	358,900	385,800	386,500	428,000	478,000
Supply of Sucrose	52,542	55,346	55,064	62408	69040
Sucrose for Ethanol Production	26,639	27,618	28,347	31,516	36,315
Sugarcane converted to Alcohol (%)	50.70	49.90	51.48	50.50	52.60

Source: USDA/FAS/ATO/Sao Paulo. Note: Marketing Year (MY) is May - April. * Forecast.

Total ethanol production for MY 2007/08 is projected at 20.45 billion liters (8.6 billion liters of anhydrous ethanol and 11.85 billion liters of hydrated ethanol), up 2.59 billion liters from previous marketing year.

Sugarcane Area Expansion

Total sugarcane planted area for MY 2007/08 is projected at 7.19 million hectares (ha), a 10 percent increase vis-à-vis MY 2006/07 (6.55 million ha). Total harvested area for MY 2007/08 is forecast at 6.47 million ha, up 530,000 ha from MY 2006/07 (5.94 million ha).

Sugarcane area has steadily expanded in Brazil in recent years. The number of sugar-ethanol and ethanol plants in Brazil was 325 in 2006/07. Post contacts report that 18 new plants started operations in MY 2006/07, 16 new plants are expected to begin crushing in MY 2007/08 and 32 are expected to open in MY 2008/09.

UNICA projects that over 410 sugar-ethanol plants should be in operation by 2012/2013. Total area planted to sugarcane is expected to increase to over 10 million hectares. Sugarcane and ethanol production are expected to reach 727 million metric tons and 38 billion liters, respectively.

Expansion has occurred in western Sao Paulo, Parana, Minas Gerais, Mato Grosso do Sul, Goias and Mato Grosso. New plants usually start to crush at one-third of total capacity (estimated at 1.5 – 2 mmt of sugarcane per plant). New projects normally begin solely with ethanol production to maximize the industrial efficiency.

Foreign investment already represented approximately 29 million metric tons, or 7 percent of all sugarcane crushed in Brazil, in MY 2006/07. The share of foreign investment in ethanol production is estimated at 6 percent (approximately 503 million liters of hydrated and 550 million liters of anhydrous production). Industry sources project the share of foreign investment in sugarcane crushing at 12-15 percent in the next 6 years.

Currently, Louis Dreyfus is the major foreign group in sugarcane crushing in Brazil (7 plants crushing over 10 mmt of sugarcane in 2006/07), followed by the Tereos Group (8.5 mmt in 2006/07). Other foreign enterprises include Kuok, Cargill, Noble, Adeco Agro, Sucden and Clean Energy.

In spite of the rapid expansion of sugarcane in Brazil, the use of agricultural feedstocks in biofuel production is not expected to have a significant impact on food and feed markets. The table below shows the current use of land in Brazil, as reported by MAPA and UNICA. Total arable land excludes the Amazon Forest, the wetlands of the Pantanal, and other preservation areas, in addition to areas not traditionally suitable for agriculture due to topography, soil restrictions, et cetera.

Agricultural Land in Brasil in 2006.

	Million Hectares	%
Cutivated Land: all crops	63.1	18.6%
Soybeans	21.9	6.4%
Corn	13.0	3.8%
Sugarcane (all uses)	7.3	2.1%
Sugarcane for ethanol	3.6	1.1%
Oranges	0.8	0.2%
Pastures	199.9	58.8%
Available land	76.9	22.6%
Total Agricultural Land	339.9	100.0%
Total Brazil	849.9	

Source: MAPA and UNICA

Currently, sugarcane occupies approximately 2 percent of total agricultural land, whereas natural and extensive pastures occupy the vast majority of the land suitable for agriculture. Whereas sugarcane may displace some soybeans, corn and cotton production, it should not replace them given that sugarcane area expansion takes place mainly in pasture areas.

Concurrently, pasture management in Brazil has been steadily improving. Highly extensive systems (0.7 head/hectare) have been replaced by more intensive use of the land (1.4 heads/hectare), which are still highly extensive. The intensive use of the land with the use of feed slots has also become more common in Brazil, with exceptional gains in productivity. Indeed, sugarcane is taking over pasture areas with no damage to livestock production as well.

Production Cost

The table below shows sugarcane production costs, as reported by FNP. Note that the production costs do not include land price. Industry sources estimate the current cost of producing ethanol from sugarcane at US$ 0.29/liter (rate of exchange US$ 1.00 = R$ 2.00).

Sugarcane Production Cost in the State of Sao Paulo, Mechanical Harvest (US$/hectare)							
	Planting	**1st Cut**	**2nd Cut**	**3rd Cut**	**4th Cut**	**5th Cut**	**Agv Cuts**
Land Depreciation	0	472	375	337	295	258	347
Seedling	482	0	0	0	0	0	0
Planting (Manual)	165	0	0	0	0	0	0
Labor (except Planting)	78	37	37	35	30	30	34
Mechanized Operations (except Harvest)	452	122	122	136	122	122	125
Inputs (Total)	409	239	239	256	239	239	242
Fertilizer and Lime	188	154	154	171	154	154	157
Herbicides	70	85	85	85	85	85	85
Pesticides	151	0	0	0	0	0	0
Mechanical Harvest	0	438	348	312	274	240	322
Head Costs	152	221	207	201	195	190	203
Total Costs (US$)	1,737	1,528	1,327	1,276	1,154	1,078	1,273
Average Yield (ton/ha)		122	97	87	77	67	90
Total Cost (US$/ton)	0	13	14	15	15	16	14
Gross Income (US$)	0	2,551	2,028	1,819	1,610	1,401	1,882
Net Income (US$/ha.ano)	0	1,022	701	543	456	323	609
Sugarcane Price (US$/ton) - CONSECANA MY 2005/06							20.91
Source: Agrianual 2007, FNP. Prices were collected in August 2006.							
ROE (R$/US$) = 2.15							

Research

The Sugarcane Technological Center (CTC) located in Sao Paulo State is the leading research center for sugarcane, sugar and ethanol in Brazil, responsible for over 80 percent of all research and development related to the sugar-ethanol-energy sector in the country. CTC is a private institution that has worked in this field for over 30 years. The more than 140 associates are located throughout Brazil providing CTC a unique opportunity to establish field trials and develop projects in varied locations with distinct soil, topography and weather.

About 60 CTC sugarcane varieties account for 50 percent of the total area planted to sugarcane in Brazil. The institution's research projects include the entire sugarcane production chain, from the field to industry. Projects include not only breeding programs (development of new varieties), but also the use of biotechnology, crop management, industrial and agricultural mechanization, sugar and ethanol production, biomass power generation and development of biodegradable plastics.

The Brazilian Agricultural Research Corporation (Embrapa) is the Ministry of Agriculture's equivalent to USDA's Agricultural Research Service and is Brazil's largest agricultural research entity. Embrapa traditionally has not done research on sugarcane. However, Embrapa is the major research entity for other basic crops, such as castor beans, soybeans and palm kernel, which may be already, or may become in the future, inputs into biofuels, particularly biodiesel production.

In June 2006, the Ministry of Agriculture, Livestock and Food Supply released the Brazilian Agroenergy Plan, which establishes a framework for public and private actions related to bioenergy fields, as well as creating the Embrapa Agroenergy Research Center that will focus on technology transfer and investment in research projects on biofuels.

It is important to observe that other traditional institutions like the Campinas Institute of Agronomy (IAC) and Planalsucar have also been conducting research on sugarcane and ethanol.

Dedini Corporation, the largest Brazilian designer and manufacturer of sugar and biofuels processing plants, has been developing a low acid process called Dedini Rapid Hydrolysis (DRH) to convert cellulose from sugarcane bagass, tops and leaves into sucrose. DRH uses a strong lignin solvent at high temperatures enabling quick access to cellulose and hemicellulose, thus allowing sugar formation in minutes.

According to Dedini, 1 hectare of planted sugarcane currently produces 80 mt of sugarcane (average for the center-south mills), which can be converted to 6,400 liters of hydrated ethanol through the extraction of the sugarcane juice. Dedini foresees that the introduction of the DRH process could almost double the efficiency in ethanol production given that ethanol would be produced not only from the sugarcane juice, but also from bagass, tops and leaves. The company estimates that with the introduction of DRH to the process, 1 hectare will produce 96 mt of sugarcane (including tops and leaves), which could be converted to 12,050 liters of hydrated ethanol (6,400 liters from the juice and 5,650 liters from bagass, tops and leaves).

Dedini built a 5,000 liter ethanol/day fully operational semi-industrial plant in November 2002 to conduct research on DRH in partnership with the Sugar and Ethanol Cooperative (Coopersucar) and the State of Sao Paulo Research Foundation (FAPESP).

FAPESP has recently issued a document including biofuels research as one of the institution's priorities for the next 5-10 years. Indeed, FAPESP has already moved forward with regard to this matter, setting up a partnership with Dedini on July 17 to finance technological research projects to improve ethanol from sugarcane manufacturing processes. Both institutions will provide R$ 100 million during the next 5 years to support cooperative projects between Dedini, universities, and public or private research institutions in the state of Sao Paulo.

Sugarcane and Ethanol Producers' Prices

The average sugarcane price in the state of Sao Paulo for MY 2006/07 was R$ 50.33 per mt of sugarcane, up R$ 5.34 per mt relative to MY 2005/06 (R$ 44.99), as reported by the State of Sao Paulo Sugarcane, Sugar and Alcohol Growers Council (CONSECANA). Note that this price refers to sugarcane purchased by mills from third party suppliers.

The Ethanol Indexes released by the University of Sao Paulo's College of Agriculture "Luiz de Queiroz" (ESALQ) follow. The Indexes track anhydrous and hydrated prices received by producers in the domestic spot market. Ethanol prices have been steadily decreasing since the beginning of the crushing season as a consequence of the higher availability of the product.

Fuel Alcohol Prices: State of São Paulo (R$/000 liters).

	Anhydrous					Hydrated				
Month	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007
January	922.03	633.43	885.13	1040.59	870.69	803.02	561.13	763.41	1018.24	845.36
February	1024.82	451.61	847.92	1063.94	837.39	876.62	372.62	765.47	1064.2	802.87
March	1005.16	390.48	875.67	1191.42	912.93	857.81	341.15	772.09	1208.53	855.05
April	996.71	462.93	842.91	1185.53	1072.57	840.26	415.9	734.91	1063.46	940.51
May	883.79	541.86	680.88	966.47	883.78	745.22	472.73	593.29	848.56	690.84
June	644.8	628.86	669.81	983.66	675.07	576.24	536.48	584.96	854.55	587.86
July 1/	586.23	678.64	773.32	1036.03	663.09	476.43	580.63	672.77	898.36	582.44
August	709.35	756.54	759.74	955.43	--	599.6	653.07	657.65	819.57	--
Septembe	669.34	774.52	843.78	878.49	--	576.7	654.32	735.72	756.09	--
October	593.17	905.57	938	867.02	--	505.29	766.69	820.25	758.58	--
Novembe	650.31	978.91	928.65	858.93	--	527.76	837.73	817.91	751.59	--
December	708.84	907.16	1053.25	849.55	--	608.18	774.33	947.24	778.07	--

Source: USP/ESALQ/CEPEA. 1/ July 2007 refers to July 9-13.

Consumption

Brazil is an important user of ethanol for fuel consumption. Ethanol represented approximately 35 percent in gasoline equivalent of total Otto cycle fuels consumption in 2006. Note that this figure was higher in recent years (approximately 40 percent). The reduction in 2006 was due to a jump in gasoline consumption, as shown in the table below.

Brazilian Apparent Consumption of Liquid Fuels

	2001	2002	2003	2004	2005	2006	2007 3/
Ethanol (m3)	11,150,172	11,027,430	11,548,061	12,080,296	12,612,651	12,698,954	4,377,352
Anhydrous	6,008,669	6,418,541	7,175,666	7,650,412	7,512,430	5,512,744	1,743,254
Hydrated	5,141,503	4,608,889	4,372,395	4,429,884	5,100,221	7,186,210	2,634,098
Gasoline "A" (m3) 1/	16,169,000	16,193,000	14,598,000	15,481,000	15,978,000	18,481,000	n/a
Natural Gas - light vehicles (million Nm3)	625	826	1,326	1,684	2,043	2,532	n/a
Total Consumption Otto Cycle (m3) 2/	26,951,000	27,156,000	26,628,000	28,388,000	29,648,000	32,323,000	n/a
Diesel (m3)	37,101,000	37,668,000	36,853,000	39,219,000	39,137,000	36,708,000	n/a
Natural Gas - heavy vehicles (million Nm3)	12	16	25	32	38	45	n/a
Total Consumption Otto + Diesel (m3)	64,064,000	64,840,000	63,506,000	67,639,000	68,823,000	69,076,000	n/a

Source: Datagro. 1/ Pure gasoline with no ethanol blended. 2/ Consumption estimated in gasoline equivalent. 3/Jan-April.

ATO/Sao Paulo forecasts total domestic ethanol consumption for MY 2007/08 at 17 billion liters of ethanol, up 2.85 million liters from the previous marketing year (14.2 million liters). Note that these figures include approximately 1.1 billion liters of ethanol for uses other than fuel consumption and estimated clandestine fuel ethanol sales intended to circumvent taxation.

Expected higher demand is due to an increase in the mandated level of ethanol in gasoline (25 percent as of June 1, 2007), robust sales of flex fuel vehicles (FFV) and attractive ethanol prices vis-à-vis gasoline.

Official figures for fuel consumption from the Petroleum, Natural Gas and Biofuels National Agency (ANP) follow. The figures take into account the product sales by distributors and do not include illegal sales, which are common for hydrated ethanol due to tax differentiation between the different types of ethanol. The apparent consumption of hydrated ethanol in 2006 was 7.2 billion liters (see table in the Brazilian Energy Matrix section), whereas the official figure reported by ANP was 6.01 billion liters.

Brazilian Fuel Consumption Matrix (million liters)

	2003	2004	2005	2006
Diesel	36,853	39,219	39,052	38,854
Gasoline C**	21,791	23,165	23,542	23,979
Hydrated Ethanol	3,245	4,355	4,654	6,010

Source: ANP

** including 20-25 percent anhydrous ethanol

As reported by the Brazilian Association of Vehicle Manufacturers (ANFAVEA), the size of the Brazilian light vehicle fleet was estimated at 21.6 million units in 2006. Total pure hydrated ethanol and flex fuel powered vehicles were estimated at approximately 3.07 million units in 2006, representing 14 percent of the total fleet. ANFAVEA projects the light vehicle fleet to grow to 25.8 million units by 2010 with flex fuel vehicles representing approximately one-third of the total. The table below shows the sales of FFV and hydrated ethanol powered cars since 2003. Note that sales of FFV currently represent over 80 percent of total vehicle sales.

Domestic Sales of Alcohol Powered Vehicles (pure alcohol & flex fuel units)

1999	2000	2001	2002	2003	2004	2005	2006	2007 1/
10,947	10,292	18,335	55,961	84,558	379,329	897,308	1,425,177	713,362

Source: ANFAVEA 1/ January-May.

Note: Flex fuel vehicles were introduced in March 2003.

Attractive ethanol vis-à-vis gasoline prices are a key variable encouraging renewable fuel consumption, given that sales of flex-fuel vehicles *per se* do not support a higher demand for ethanol. Overall, consumers are driven by the ratio between ethanol and gasoline prices. In practice, a 70 percent ratio between ethanol and gasoline prices is generally accepted as determining if flex car owners will choose to fill up with ethanol (price ratio below 70 percent) or gasoline (price ratio above 70 percent).

The table below shows the average prices for gasoline and ethanol, as well as the price ratio for January-February (off-peak) and June-July (peak season) in 2005, 2006 and 2007 for selected Brazilian states and metropolitan cities. The price ratio is notably more favorable to ethanol in 2007 relative to 2006. In addition, the ratio indicates expected higher ethanol consumption in the initial months of MY 2007/08 (June-July), even in cities very distant from producing regions, such as Porto Alegre and Fortaleza, as a consequence of the beginning of the crushing season and higher availability of the product in the market.

Gasoline and Ethanol Prices in Selected States (average price, R$/liter)

		Gasoline			Ethanol			Ratio Ethanol/Gasoline		
		2005	2006	2007	2005	2006	2007	2005	2006	2007
Sao Paulo	January	2.187	2.376	2.405	1.240	1.759	1.367	57%	74%	57%
State	February	2.190	2.373	2.339	1.228	1.546	1.361	56%	65%	58%
	June	2.147	2.415	2.419	0.990	1.305	1.314	46%	54%	54%
	July 1/	2.145	2.424	2.411	1.049	1.342	1.234	49%	55%	51%
Sao Paulo	January	2.185	2.371	2.403	1.242	1.496	1.363	57%	63%	57%
City	February	2.190	2.370	2.397	1.231	1.545	1.356	56%	65%	57%
	June	2.149	2.412	2.416	0.994	1.306	1.316	46%	54%	54%
	July 1/	2.145	2.421	2.409	1.049	1.340	1.242	49%	55%	52%
Minas Gerais	January	2.156	2.382	2.392	1.578	1.867	1.749	73%	78%	73%
	February	2.148	2.398	2.360	1.571	1.924	1.744	73%	80%	74%
	June	2.085	2.396	2.404	1.404	1.845	1.662	67%	77%	69%
	July 1/	2.117	2.414	2.377	1.443	1.826	1.571	68%	76%	66%
Belo Horizonte	January	2.115	2.336	2.345	1.550	1.853	1.733	73%	79%	74%
(MG Capital)	February	2.107	2.352	2.315	1.548	1.915	1.730	73%	81%	75%
	June	2.045	2.364	2.379	1.392	1.840	1.643	68%	78%	69%
	July 1/	2.070	2.379	2.343	1.418	1.817	1.550	69%	76%	66%
Rio Janeiro	January	2.268	2.511	2.488	1.598	1.850	1.728	70%	74%	69%
State	February	2.264	2.517	2.488	1.586	1.887	1.754	70%	75%	70%
	June	2.234	2.534	2.511	1.419	1.807	1.653	64%	71%	66%
	July 1/	2.226	2.521	2.496	1.407	1.767	1.565	63%	70%	63%
Rio de Janeiro	January	2.265	2.505	2.481	1.595	1.841	1.717	70%	73%	69%
Capital	February	2.260	2.511	2.483	1.581	1.876	1.737	70%	75%	70%
	June	2.231	2.526	2.507	1.412	1.795	1.640	63%	71%	65%
	July 1/	2.222	2.514	2.492	1.401	1.757	1.549	63%	70%	62%
Porto Alegre	January	2.442	2.596	2.600	1.702	2.222	1.848	70%	86%	71%
(RS Capital)	February	2.411	2.630	2.463	1.654	2.228	1.829	69%	85%	74%
	June	2.475	2.689	2.585	1.667	2.100	1.789	67%	78%	69%
	July 1/	2.526	2.707	2.561	1.726	2.097	1.660	68%	77%	65%
Goiania	January	2.371	2.516	2.329	1.551	1.660	1.425	65%	66%	61%
(GO Capital)	February	2.289	2.480	2.499	1.474	1.777	1.487	64%	72%	60%
	June	2.162	2.426	2.583	1.182	1.467	1.359	55%	60%	53%
	July 1/	2.285	2.543	2.575	1.230	1.499	1.240	54%	59%	48%
Fortaleza	January	2.344	2.560	2.625	1.656	1.756	1.661	71%	69%	63%
(CE Capital)	February	2.214	2.656	2.620	1.641	1.812	1.680	74%	68%	64%
	June	2.262	2.705	2.492	1.627	1.950	1.719	72%	72%	69%
	July 1/	2.389	2.751	2.425	1.622	1.951	1.694	68%	71%	70%

Source: Petroleum, Natural Gas and Biofuels National Agency (ANP). 1/ July 2007 refers to July 1-14.

Green Area means ethanol prices more attractive than gasoline

Red Area means gasoline prices more attractive than ethanol

Trade

Exports

Post projects Brazilian ethanol exports for MY 2007/08 at 3 billion liters, an 845 million liter reduction compared to the previous marketing year. Lower demand for Brazilian exports is expected as a result of increased ethanol production capacity in the United States and the strength of the Real vis-à-vis the U.S. dollar. The decreased demand from the United States may be partially offset by increased demand from other countries. In addition, potential

demand in Brazil is likely to be more sensitive to moderate price decreases than international demand would be. The table below shows Brazilian ethanol exports by calendar year, as reported by the Brazilian Secretariat of Foreign Trade (SECEX).

Brazilian Ethanol Exports (000 liters)

	2003	2004	2005	2006	2007 1/
Hydrous	690,466	2,210,970	2,501,944	3,098,266	1,470,529
Anydrous	59,132	172,593	90,349	330,596	76,156
Total	749,598	2,383,563	2,592,293	3,428,862	1,546,685

Source: ATO/Sao Paulo, based on SECEX figures. 1/ Jan-June
Note: Hydrous refers to NCM 2207.10.00 and Anhydrous refers to NCM 2207.20.10

The United States was the major destination of Brazilian ethanol exports for MY 2006/07. Total direct exports accounted for approximately 47 percent of total direct ethanol exports (1.81 billion liters), whereas indirect exports through the Caribbean Basis Initiative (CBI) countries represented an additional 600 million liters. Note that the U.S. Government's CBI exempts imports from the Caribbean from payment of the US$ 0.54 per gallon import tariff, encouraging Brazilian alcohol exports to that region. The tables below show Brazilian ethanol exports by type of product for calendar years 2005 and 2006 and for MY 2006/07.

Brazilian Hydrated Alcohol Exports by Country of Destination (NCM 2207.10.00, MT, 000 liters, US$ 000 FOB).

	CY 2005 1/			CY 2006 1/			MY 2006/07 2/		
Country	Weight	Volume	Value	Weight	Volume	Value	Weight	Volume	Value
United States	184,740	231,203	70,104	1,198,006	1,512,287	748,121	1,228,535	1,552,001	784,895
Holland	202,616	248,200	76,720	264,087	332,219	146,864	314,553	396,380	187,233
Japan	243,061	301,466	89,831	179,717	222,408	94,430	215,069	266,552	126,318
Sweden	196,068	245,891	70,102	150,788	188,917	74,457	173,690	217,838	93,357
El Salvador	119,579	157,851	41,888	146,155	181,143	80,278	159,004	197,031	91,024
Jamaica	107,803	133,288	40,323	105,996	131,036	55,951	154,723	191,325	83,071
Costa Rica	100,101	123,845	37,664	73,784	91,265	34,763	92,342	114,194	49,003
Trinidad & Tobago	29,187	36,116	11,348	51,134	63,216	30,739	91,043	112,629	51,354
Nigeria	92,330	114,307	34,497	34,487	42,680	19,465	70,521	87,237	40,274
Venezuela	38,649	48,878	16,501	62,391	78,935	48,800	62,391	78,935	48,800
Others	694,227	860,900	253,557	205,099	254,160	103,318	226,136	281,180	123,894
Total	2,008,360	2,501,944	742,536	2,471,644	3,098,266	1,437,186	2,788,006	3,495,302	1,679,223

Source: Brazilian Secretariat of Foreign Trade (SECEX). 1/ Calendar Year: Jan-Dec, 2/ Marketing Year: May-April

Brazilian Anhydrous Alcohol Exports by Country of Destination (NCM 2207.20.10, MT, 000 liters, US$ 000 FOB).

	CY 2005 1/			CY 2006 1/			MY 2006/07 2/		
Country	Weight	Volume	Value	Weight	Volume	Value	Weight	Volume	Value
United States	23,718	29,512	7,359	201,366	254,772	134,243	204,585	258,845	136,656
Venezuela	472	600	271	20,289	25,669	15,898	20,140	25,484	15,736
Sweden	0	0	0	10,283	13,023	4,879	20,108	25,476	10,216
Jamaica	0	0	0	408	507	137	16,519	20,541	8,655
France	0	0	0	7,028	8,900	3,909	7,028	8,900	3,909
Holland	8,878	11,203	2,856	11,490	14,396	4,479	5,945	7,504	3,180
Trinidad & Tobago	0	0	0	6,736	8,363	2,618	2,401	2,981	1,238
Angola	0	0	0	134	166	128	134	166	128
South Korea	0	0	0	0	0	0	106	131	67
Ivory Coast	0	0	0	0	0	0	26	32	36
Others	39,065	49,034	12,508	3,866	4,799	1,253	0	0	0
Total	72,134	90,349	22,993	261,600	330,596	167,544	276,990	350,060	179,821

Source: Brazilian Secretariat of Foreign Trade (SECEX). 1/ Calendar Year: Jan-Dec, 2/ Marketing Year: May-April

Imports

The table below shows Brazilian ethanol imports by calendar year, as reported by the Brazilian Secretariat of Foreign Trade (SECEX). Imports are mainly for industrial use.

Brazilian Ethanol Imports (000 liters)

	2003	2004	2005	2006	2007 1/
Hydrous	6,111	374	222	90	21
Anydrous	30	1	5	6	3,802
Total	6,141	375	227	96	3,823

Source: ATO/Sao Paulo based on SECEX figures. 1/ Jan-June

Note: Hydrous refers to NCM 2207.10.00 and Anhydrous refers to NCM 2207.20.10

Stocks

ATO/Sao Paulo forecasts ending stocks for MY 2007/08 at 265 million liters, as ethanol exports are not expected to repeat the excellent performance of the previous marketing year due to increased ethanol production capacity in the United States.

The crush season for sugar cane has steadily lengthened over recent years, and approximately five percent of the Center-South sugarcane crop is now crushed before the start of the marketing year. One consequence of this development is that ending stocks tend to be extremely low (around 1 percent of total use or less), to the point that ending stocks for 2006/07 were negative (with 2007/08 production being crushed and consumed prior to May 1).

Policy

On March 9, 2007, the Presidents of the United States and Brazil signed a Memorandum Of Understanding (MOU) expressing their intention to cooperate on the development of a global biofuels industry through a three-pronged approach.

I. Bilateral: The Participants intend to advance the research and development of next generation biofuels technology;

II. Third Countries: The Participants intend to work jointly to bring the benefits of biofuels to select third countries through feasibility studies and technical assistance aimed at stimulating private sector investment in biofuels. The Participants intend to begin work in Central America and the Caribbean to encourage local production and consumption of biofuels, with a view to continue joint work in key regions across the globe.

III. Global: The Participants desire to expand the biofuels marketplace through cooperation on the establishment of uniform standards and codes.

No significant changes have been made to government policies related to ethanol. Although generally deregulated, market dynamics are influenced by the ethanol use mandate and tax credits.

Current legislation requires an ethanol content between 20 and 25 percent, with the executive branch having the flexibility to adjust within that band. The percentage of ethanol blended to gasoline was reduced from 25 to 20 percent on March 1, 2006, due to ethanol shortages and increased prices. The government monitored the supply and demand of ethanol and increased the percentage to 23 percent on November 21, 2006, and, then to 25 percent on June 1, 2007, as a consequence of higher expected availability of the product.

Federal and state taxes on automotive fuels include three major components:

- CIDE (*Contribuicao de Intervencao no Dominio Economico)*: Funds raised via this fuel tax are, in theory, used to finance infrastructure works and maintenance of the transportation system. For gasoline, CIDE is fixed at R$ 0.28/liter and is charged to the manufacturer (Petrobras) upon sale to distributors. For ethanol, the tax is currently fixed at zero.

- PIS/COFINS Social Tax: These two taxes are charged together. For gasoline, a fixed assessment of R$ 0.2616/liter is charged to the manufacturer upon sale to distributors. For ethanol, a rate of 3.65 percent is assessed on the sale from the manufacturer to the distributor, and a further 8.20 percent is assessed on the sale from the distributor to the retailer.

- Merchandise Circulation Tax (ICMS): This is a state tax, which ranges for ethanol from 12 to 35 percent, with most states charging 25 percent. Most states charge the same *ad valorem* levy for both gasoline and ethanol.

In addition to the ethanol mandate and tax incentives, the National Bank for Social and Economic Development (BNDES) provides credit lines to fund the construction of new mills and the modernization of existing ones. Funds are available up to a limit of R$ 10 million during the 2007-2012 period. In March 2004, BNDES also created the Financial Support Program for Investments in Alternative Sources of Electric Energy (PROINFA), holding R$ 5.5 billion to finance projects to be contracted by December 30, 2006.

Exchange Rate

Exchange Rate (R$/US$1.00 - official rate, last day of period)

Month	2003	2004	2005	2006	2007
January	3.53	2.94	2.62	2.22	2.12
February	3.56	2.91	2.60	2.14	2.12
March	3.35	2.91	2.67	2.17	2.05
April	2.89	2.94	2.53	2.09	2.03
May	2.97	3.13	2.40	2.30	1.93
June	2.87	3.11	2.35	2.16	1.93
July 1/	2.97	3.03	2.39	2.18	1.86
August	2.97	2.93	2.36	2.14	---
September	2.92	2.86	2.22	2.17	---
October	2.86	2.86	2.25	2.14	---
November	2.95	2.73	2.21	2.17	---
December	2.89	2.65	2.26	2.14	---

Source: Gazeta Mercantil. And BACEN (as of October 2006).

1/ July 2007 refers to July 16