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Biofuels Annual

Biofuels - Ethanol and Biodiesel

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Report Highlights: In February 2015, the government of Brazil (GOB) raised federal taxes (CIDE and PIS/COFINS) on gasoline to R\$ 0.22 /liter, which increased the competitiveness of ethanol relative to the fossil fuel. Some Brazilian states also increased the state tax for circulation of goods and services (ICMS) on gasoline and reduced the tax for ethanol, which further stimulated ethanol consumption. In March 2015, the GOB authorized an increase in the ethanol blend for gasoline from 25 to 27 percent. Total Brazilian ethanol production for 2016 is projected at 30.68 billion liters, a five percent increase compared to 2015. Ethanol exports for 2016 are forecast stable at 1.35 billion liters. The biodiesel industry remains regulated by the government, with the current biodiesel mandate set at seven percent. The industry advocated for an increase of the blend to 10 by 2020. Biodiesel production for 2016 is projected at 4.1 billion liters, similar to expected production for 2015 based on the stagnant economic situation in Brazil.

1. Executive Summary

The report includes the following sections: (1) Executive Summary; (2) Policy and Programs; (3) Transport Fuel Consumption Projections; (4) Ethanol; (5) Biodiesel; (6) Advanced Biofuels; (7) Notes on Statistical Data; (8) Exchange Rate.

1.1. Brazil's Geographic Division

The map below shows Brazil's division by regions and states.



2. Policy and Programs

For a historical perspective of the Brazilian Ethanol Program (Proalcool) and the National Biodiesel Production Program (PNPB) refer to [GAIN Report BR10006](#), the Brazil Biofuels Annual Report from 2010. (BR10006).

2.1. Government Support Programs for Ethanol

Since the 1990s, the government of Brazil (GOB) has had no direct control over the volume of ethanol produced, consumed domestically, or exported. GOB has also abolished any type of price control during the aforementioned period. However, the GOB can influence ethanol production and price setting through the ethanol-use mandate and tax incentive measures.

2.1.1. Regional Producer Subsidy

The "Regional Producer Subsidy" is the only direct subsidy paid by the GOB. The program was created decades ago to provide sugarcane producers from the north-northeastern states support to balance their cost of production with that of the most developed growing areas in center-south Brazil. Throughout the years the GOB has tailored this subvention program to the evolving reality of the sugarcane industry.

In July 2014, President Roussef sanctioned Bill # 12.999/14 which authorized an economic subvention of R\$ 12.00/metric ton (MT) of sugarcane for 27,000 growers from the northeastern states and the state of Rio de Janeiro, to offset losses from the drought that affected the 2012/13 crop in those regions. The drought was reported as the worst seen in decades. The total amount of support authorized in the bill was R\$ 187 million, with payout required by the end of CY 2015. However, in July 2015, the Ministry of Treasury met with the Northeastern Sugarcane Production Union (UNIDA) and the Sugarcane Growers Association from North Fluminense (Aflucan) in Rio de Janeiro to explain that these funds are not available because of the tight financial situation the GOB is currently experiencing. It is unlikely that funds will be made available before the bill expires at the end of 2015. Both grower organizations indicate they are likely to organize protests against the President as a result.

2.1.2. Ethanol Use Mandate

The ethanol-use mandate has been mandatory since 1977 when the legislation required a 4.5 percent blend of ethanol to gasoline. The ethanol blend has risen as high as 25 percent throughout the years. However, the minimum blend has been set at 18 percent since 2011.

In September 2014, President Roussef sanctioned Bill # 13.033/14 (http://www.planalto.gov.br/ccivil_03/Ato2011-2014/2014/Lei/L13033.htm), which increased the maximum ethanol blend in gasoline from 25 to 27.50 percent. The law set a broader ethanol blend range for gasoline, but did not authorize the effective increase of the 25 percent blend to a higher value before a technical study was conducted to support such an increase. In March 2015, after several technical and environmental studies conducted by the Brazilian Oil Company Research Center (Petrobras/CENPES), the Interministerial Sugar and Ethanol Council ((Conselho Interministerial de Acucar e Alcool) – CIMA) authorized the increase in the ethanol blend to gasoline from 25 to 27 percent. The measure became effective March 16, 2015. Tests included several short and long term studies to determine the impact of the increased blend rate on gasoline engines.

Increasing the ethanol blend for gasoline was an old request from the ethanol industry which has experienced difficulties for the past five years. The Sugar and Alcohol Millers Association of São Paulo State (UNICA) estimates that the new blend can represent an additional domestic demand of 1.1 billion liters of ethanol for the MY 2015/16 crop which is equivalent to approximately 14 million metric tons of sugarcane. The new mandate applies only to regular gasoline. The percentage of ethanol for premium gasoline remains 25 percent.

2.1.3. Tax Incentives for Ethanol

A. Tax Incentives for Ethanol-flex Fuel Vehicles

Tax incentives have played an important role in supporting ethanol consumption since the introduction of flex-fuel cars. The table below shows the value of Tax on Industrialized Products (IPI), Contribution to the Social Integration Program/Contribution for Financing Social Security (PIS/COFINS) and state tax for circulation of goods and services (ICMS) for different categories of vehicles as reported by the National Association of Motor Vehicle Manufacturers (ANFAVEA). Note that IPI on flex cars has been lower compared to gasoline only powered vehicles.

From May 2012 through 2014 temporary IPI reductions were authorized by GOB in order to encourage household consumption through the purchasing of new vehicles, thus positively

contributing to the overall Brazilian macroeconomic situation. ANFAVEA reports that regardless of the engine power, the tax burden as a share of the suggested retail price is usually lower for flex-fuel than gasoline only powered vehicles.

Taxes Applied to Ethanol, Flex-Fuel and Gasoline Vehicles (Percentage)						
Year	Taxes	1000 cc	1001-2000 cc		Over 2000 cc	
		Gas 1/ /Eth/Flex	Gas 1/	Eth/Flex	Gas 1/	Eth/Flex
2004 to 2007	IPI	7	13	11	25	18
	ICMS	12	12	12	12	12
	PIS/COFINS	11.6	11.6	11.6	11.6	11.6
	% of Avg MSRP	27.1	30.4	29.2	36.4	33.1
2008	IPI	0	6.5	5.5	25	18
	ICMS	12	12	12	12	12
	PIS/COFINS	11.6	11.6	11.6	11.6	11.6
	% of Avg MSRP	22.2	26.4	25.8	36.4	33.1
2009	IPI	5/3*	11	7.5	25	18
	ICMS	12	12	12	12	12
	PIS/COFINS	11.6	11.6	11.6	11.6	11.6
	% of Avg MSRP	25.7/24.4*	29.2	27.1	36.4	33.1
January - March 2010	IPI	7/3*	13	7.5	25	18
	ICMS	12	12	12	12	12
	PIS/COFINS	11.6	11.6	11.6	11.6	11.6
	% of Avg MSRP	27.1/24.4*	30	27.1	36.4	33.1
As of April 2010 and 2011	IPI	7	13	11	25	18
	ICMS	12	12	12	12	12
	PIS/COFINS	11.6	11.6	11.6	11.6	11.6
	% of Avg MSRP	27.1	30.4	29.2	36.4	33.1
May - December 2012	IPI	0	6.5	5.5	25	18
	ICMS	12	12	12	12	12
	PIS/COFINS	11.6	11.6	11.6	11.6	11.6
	% of Avg SRP	22.2	26.4	25.8	36.4	33.1
2013	IPI					
	ICMS	2	8	7	25	18
	PIS/COFINS	12	12	12	12	12
	% of Avg MSRP	11.6	11.6	11.6	11.6	11.6
2014	IPI	3	10	9	25	18
	ICMS	12	12	12	12	12
	PIS/COFINS	11.6	11.6	11.6	11.6	11.6
	% of Avg MSRP	24.4	28.6	28	36.4	33.1

Source: National Association of Motor Vehicle Manufacturers (ANFAVEA). Data/year is captured as reported by ANFAVEA.

1/ Gas = Gasoline. *The tax of 3% refers to flex fuel cars MSRP = Manufacturer Suggested

Retail Price. The aggregation of the individual taxes does not necessarily add up to the percentage of the Average Retail Price (fourth row) because each individual tax applies to different steps of the production chain and not to the final retail price. During 2013 and 2014, the Brazilian government offered temporary tax breaks to some categories.

B. Tax Incentives for Ethanol Fuel

The GOB has a complex tax system including several taxes at the federal, state, and municipal level. Depending on the economic and financial strategies pursued by policymakers, GOB can provide incentives for gasoline and/or ethanol at the pump. Currently, GOB provides preferential treatment for ethanol compared to gasoline under both its Contribution for Intervention in Economic Domain (CIDE) and Contribution to the Social Integration Program/Contribution for Financing Social Security (PIS/COFINS) programs. In addition, governments from several Brazilian states provide differential treatment for ethanol by using different state taxes for circulation of goods and services (ICMS) percentages for ethanol and gasoline.

1. Contribution for Intervention in Economic Domain (CIDE)

CIDE was created in December 2001 by Bill # 10.336 (http://www.planalto.gov.br/ccivil_03/leis/LEIS_2001/L10336.htm) to tax oil and derivatives, natural gas and derivatives, and fuel ethanol. The tax was created to finance infrastructure works and maintenance of the transportation system, as well as finance environmental projects related to the oil and natural gas industry and; to pay price and/or distribution subsidies, if determined by specific legislation to ethanol, natural gas, and oil derivatives.

CIDE for ethanol, while an applicable tax, has been fixed to zero since May 2004, according to Presidential Decree # 5,060 of April 2004 (http://www.planalto.gov.br/ccivil_03/_ato2004-2006/2004/decreto/d5060.htm). For gasoline the value was initially set at R\$ 0.28/liter and readjusted to R\$ 0.18 in May 2008, R\$ 0.23 in June 2009 and finally zero in June 2012. These changes were intended to control inflation on fuels and to support state owned oil company Petrobras from serious economic losses. From July 2012 to February 2015 no preferential treatment under CIDE was provided for fuel ethanol compared to gasoline.

As part of the fiscal adjustment policy to offset GOB's public accounts deficit, Presidential Decree # 8,395 (http://www.planalto.gov.br/ccivil_03/_ato2015-2018/2015/Decreto/D8395.htm) increased both CIDE and PIS/COFINS on gasoline and diesel. According to the Federal Income Tax Agency (Receita Federal), the measure will allow an extra R\$ 12.8 billion to be collected in the government budget in 2015. The aggregated CIDE/PIS/COFINS increase is set at R\$ 0.22/liter for gasoline and R\$ 0.15/liter for diesel, effective February 1, 2015. The increase is applied at the refinery and distributor level. Final retail pricing is dependent upon gas station owner margins.

To comply with the legislation that requires a 90-day period between the changing of the law that regulates CIDE and its effectiveness (February through April) and to generate cash for the government during this period, the government adopted the following tariff schedule:

From February 1 to April 30, 2015:

- CIDE: R\$ 0.00/liter of gasoline
- PIS/COFINS: R\$ 0.4816/liter for gasoline (as opposed to R\$ 0.2616/liter as taxed before)
- Aggregated CIDE/PIS/COFINS: R\$ 0.4816/liter of gasoline
- **Net aggregated tax increase:** R\$ 0.22/liter of gasoline

From May 1, 2015 on:

- CIDE: R\$ 0.10/liter of gasoline
- PIS/COFINS: R\$ 0.3816/liter for gasoline (as opposed to R\$ 0.2616/liter as taxed before)
- Aggregated CIDE/PIS/COFINS: R\$ 0.4816/liter of gasoline
- **Net aggregated tax increase:** R\$ 0.22/liter of gasoline

The sugar-ethanol industry welcomed the measure given they have long advocated the increase of CIDE for gasoline to raise the competitiveness of fuel ethanol. Consumer decisions are driven by the ratio between ethanol and gasoline prices at the pump (see Section 4.3 Ethanol – Consumption), therefore, the increase in gasoline prices provides for an increase of ethanol prices.

Indeed, average prices collected by the Petroleum, Natural Gas and Biofuels National Agency (ANP) for selected states before and after the implementation of the presidential decree, show that ethanol prices increased as a consequence of increased gasoline prices.

Gasoline and Ethanol Average Retail Prices (R\$/liter)						
State	Gasoline			Ethanol		
	Jan-15	Feb-15	Price Difference	Jan-15	Feb-15	Price Difference
Alagoas	3.065	3.311	0.246	2.503	2.558	0.055
Bahia	3.082	3.497	0.415	2.416	2.541	0.125
Federal District	3.173	3.475	0.302	2.48	2.594	0.114
Mato Grosso	3.102	3.334	0.232	1.985	2.127	0.142
Rio de Janeiro	3.214	3.453	0.239	2.500	2.662	0.162
Minas Gerais	3.025	3.304	0.279	2.198	2.363	0.165
Sao Paulo	2.918	3.15	0.232	1.935	2.101	0.166

Source: ANP

2. Contribution to the Social Integration Program (PIS) and Contribution for Financing Social Security (COFINS)

PIS/COFINS are federal taxes created by Supplemental Bills # 7 (http://www.planalto.gov.br/ccivil_03/leis/LCP/Lcp07.htm) and # 8 (http://www.planalto.gov.br/ccivil_03/leis/LCP/Lcp08.htm) from September and December 1970; and Supplemental Bill 70 (http://www.planalto.gov.br/ccivil_03/leis/LCP/Lcp70.htm) from December 1991, respectively. They were both created to finance the Brazilian social security system including payment of unemployment salary support, social support, and the public health system. PIS and COFINS follow similar tax regimes and are usually charged together. Generally, they are charged as a percentage of the gross sales, but they can also be applied as a set amount per volume of fuel.

PIS/COFINS for Domestic Products

Following the tariff schedule set by Presidential Decree # 8,395 effective February, 2015 PIS/COFINS for domestic gasoline increased from R\$0.2616/liter to R\$ 0.4816/liter from February to April 1 and is set at R\$ 0.3816/liter as of May 1, 2015. The latter represents a PIS/COFINS of 9.25 percent as prescribed by the enacting legislation.

For domestic ethanol, Provisional Measure # 613 from May 2013 (converted to Bill # 12,859 in September 2013) created a PIS/CONFINS presumed credit, which in practice dropped to zero the

R\$0.12/liter (R\$0.048/liter on producers and R\$0.072/liter on distributors) applied to the product. The presumed credit refers to a tax credit a company can apply for, which is based on an estimate of all tax credits the company is eligible for along each step of the production/distribution process. According to Presidential Decree # 8,212 of March 2014 (http://www.planalto.gov.br/ccivil_03/ Ato2011-2014/2014/Decreto/D8212.htm), the presumed credit applied to ethanol is valid until December 31, 2016.

PIS/COFINS for Imported Products

In January 2004, Provisional Measure # 164 (converted to Bill # 10,865 (http://www.planalto.gov.br/ccivil_03/ ato2004-2006/2004/lei/l10.865.htm) in April 2004) introduced the payment of PIS/COFINS on imported goods and services. PIS/COFINS applied on ethanol imports were set at 9.25 percent (1.65 percent for PIS and 7.6 percent for COFINS). In December 2013, the GOB through Provisional Measure # 634 (converted to Bill # 12,995 in June 2014 (http://www.planalto.gov.br/ccivil_03/ ato2011-2014/2014/Lei/L12995.htm)), extended the PIS/COFINS tax credit for domestic ethanol to imported ethanol as well until December 31, 2016. Therefore, in practice, PIS/COFINS for ethanol imports also dropped to zero.

As part of the GOB's 2015 fiscal adjustment policy to offset its public deficit, President Rouseff sanctioned Bill # 13,137 in June 2015 (http://www.planalto.gov.br/ccivil_03/ ato2015-2018/2015/lei/l13137.htm) increasing PIS/COFINS on the majority of imported products from 9.25 (1.65 percent for PIS and 7.6 percent for COFINS) to 11.75 percent (2.1 percent for PIS and 9.65 percent for COFINS). According to Minister of Finance Joaquim Levy, the increase was necessary to correct a distortion created by the Brazilian Supreme Court when it abolished the ICMS tax from the base upon which PIS/COFINS is calculated for imports, while keeping the state tax included in base calculation for domestic goods. According to the Ministry of Finance, such distortion could damage domestic production of goods.

Importation of ethanol falls under Bill # 13,137 from June 2015. It also supersedes Bill # 12,995 from June 2014, eliminating the tax credit for PIS/COFINS on ethanol imports. Therefore, PIS/COFINS for ethanol imports increased from 9.25 percent (but actually zero due to the tax credit) to 11.75 percent. The measure is effective October 1, 2015.

Impact

Post contacts report that the increase in PIS/COFINS should have little impact on ethanol prices and that only occasional supply restraints in the beginning of the calendar year may occur. January-March represents the sugarcane off-harvest period for the center-south region, the major Brazilian sugarcane and ethanol producing region.

Overall, UNICA does not foresee a big impact for the industry, and has made public statements to that effect. Ethanol importing companies usually have accumulated PIS/COFINS credit which can be used to offset the increase of PIS/COFINS over the imported product. Otherwise, the payment of PIS/COFINS on imports can also generate a credit for the importer which may be used to pay other tax debts.

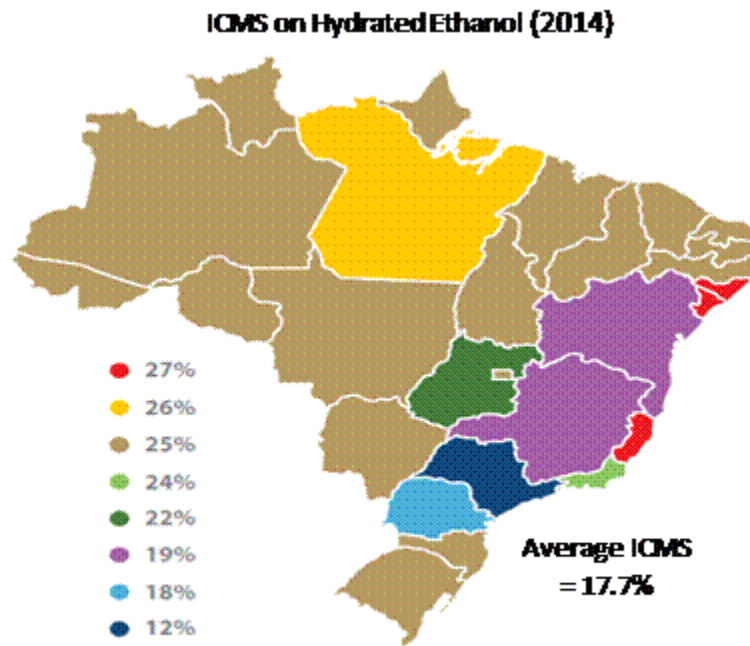
3. Tax for Circulation of Goods and Services (ICMS)

ICMS is a state tax varying from state to state. The payment of ICMS is also related to different tax regimes depending on the state. ICMS charged on ethanol varies from 12 to 27 percent, with most states charging 25 percent. ICMS for gasoline varies from 25 to 31 percent. The figures below show the ICMS set by each Brazilian state for 2014, according to the Fuels Industry Syndicate (Sindicom).

The following changes occurred in 2015. The state of Minas Gerais reduced ICMS on hydrated ethanol from 19 to 14 percent whereas it increased the tax on gasoline from 27 to 29 percent.

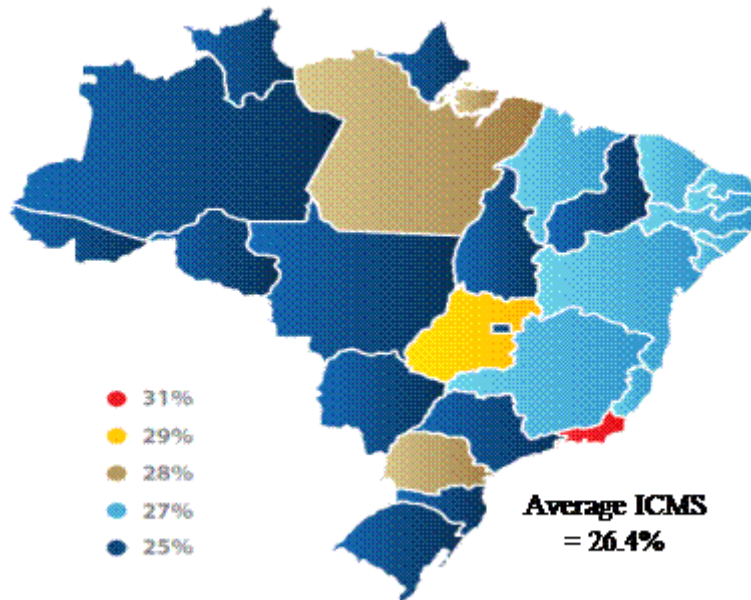
Parana increased the ICMS for gasoline from 28 to 29 percent, whereas Bahia increased the ICMS for gasoline from 27 to 29 percent.

According to UNICA, these states represent over 20 percent of the Brazilian light car fleet and over 30 percent of hydrated ethanol consumption. Therefore the applied tax reduction for ethanol and the increased taxation for gasoline should increase the competitiveness of hydrated ethanol vis-à-vis gasoline and encourage a bump in consumption.



Source: Sindicom

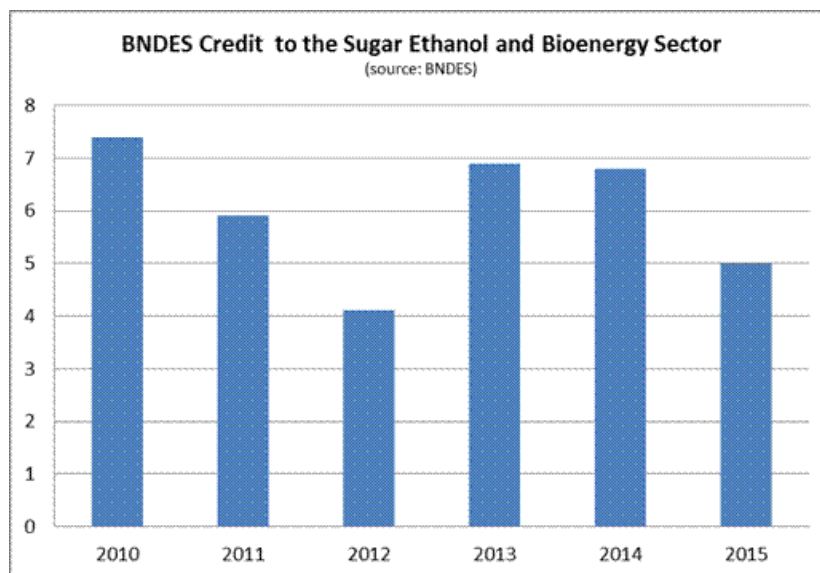
ICMS on Gasoline C (2014)



Source: Sindicom

2.1.4. Credit Lines

The National Bank for Social and Economic Development (BNDES) provides specific credit lines for the sugar, ethanol, and bioenergy industries to fund investments on sugarcane production, expansion of industrial capacity for sugar and ethanol, cogeneration, logistics, and multimodal transportation. Total financing for the industry in 2014 was R\$ 6.8 billion similar to 2013 (R\$ 6.9 billion). BNDES reports that a total of R\$ 5 billion should be released in 2015 as a consequence of likely lower activity in the industry. The graph below shows estimated BNDES credit line for the sector from 2010 to 2015. See section 6. Advanced Biofuels for PAISS Agricola program.



In June 2015, the Ministry of Agriculture, Livestock and Supply announced the Brazilian Agricultural Crop and Livestock Plan 2015/16. A total of R\$ 187.7 billion will be released to fund agricultural and livestock programs including Prorenewa for sugar and PASS for ethanol. This represents a 20 percent increase over the previous crop plan.

Prorenewa is a credit line to finance the renewal and/or expansion of sugarcane fields. A total of R\$ 1.5 billion should be available to finance the program. The interest rate is set at the "long term interest rate" (TJLP) plus 2.7 percent per year. The payment is due within 72 months and an 18-month grace period. The amount of credit per beneficiary has not been decided yet, and the GOB has not yet given an indication when it will be determined.

The ethanol stock program also known as BNDES PASS program should release a total credit of R\$ 2 billion. The interest rate is set at the "long term interest rate" (TJLP) plus 2.7 percent per year. The payment is due within 270 days. Similarly, the amount of credit per beneficiary has not been decided yet, and the GOB has not yet given an indication when it will be determined.

2.1.5. Ethanol Import Tariff

According to the Mercosul (Common Southern Market) agreement, the import tariff for ethanol is 20 percent, however, since April 2010, the product has been included in Brazil's "list of exceptions" and the import tariff has been cut to zero.

Resolution # 94 (December 31, 2011, (<http://camex.gov.br/legislacao/interna/id/921>)) of the Ministry of Development, Industry and Commerce (MDIC)/Chamber of Foreign Trade (CAMEX) maintained the zero import tariff for ethanol through December 31, 2015.

2.2. Government Support Programs for Biodiesel

2.2.1. Biodiesel Use Mandate

The National Biodiesel Production Program (PNPB) was created in 2004 to promote domestic biodiesel production, to reduce petroleum import dependency, and to lower pollutant emissions and health related costs. In addition, PNPB was established to generate jobs and income and alleviate regional economic disparities by passing on benefits to family farmers, especially those in North and Northeast Brazil.

Federal Law #11,097/2005 (http://www.planalto.gov.br/ccivil_03/_ato2004-2006/2005/Lei/L11097.htm) defined and established a legal mandate for use of biodiesel as a fuel. The biodiesel-use mandate was initially set at two percent in 2008 and further raised to higher percentages to accommodate the growing biodiesel production.

Provisional Measure # 647 from May 29, 2014 (converted to Bill # 13,033 (http://www.planalto.gov.br/ccivil_03/_Ato2011-2014/2014/Lei/L13033.htm) in September 2014), set the new biodiesel blends to diesel at six percent (B6) as of July 1, 2014, and seven percent (B7) as of November 1, 2014. As of the date of this report, the current biodiesel blend remains at seven percent. The biodiesel industry continues to advocate for a B10 blend by 2020 given that the industrial capacity is more than two times actual production goals and there is available raw material.

2.2.2. Biodiesel Import Tariff

According to the Secretariat of Foreign Trade, the import tariff applied to biodiesel (NCM 3826.00.00) is fixed at 14 percent.

2.2.3 Tax Incentives

The GOB sets federal tax exemptions and incentives, according to the nature of the raw material, size of producer and region of production, in order to encourage the production of biodiesel and to promote social inclusion. In February 2013, the GOB set the incentives as follows:

Federal Taxes for Biodiesel and Mineral Diesel (R\$/m3)					
	Biodiesel B100				Diesel
Producer Type	Family Agriculture (PRONAF)		All Other Producers		
Region	North, Northeast & Semi-Arid Zones	All Other Regions	North, Northeast & Semi-Arid Zones	All Others	
Feedstock	Any	Palm Oil or Castor Oil	Palm Oil or Castor Oil		
PIS/PASEP	0.00	10.39	22.48	26.41	26.36
COFINS	0.00	47.85	103.51	121.59	121.64

Source: Brazilian Government, February 2013.

3. Transport Fuel Consumption

Fuel consumption in Brazil, as reported by the Petroleum, Natural Gas and Biofuels National Agency (ANP), follows. The figures take into account the product sales by distributors and do not include illegal sales, which were common in the past for hydrous ethanol due to tax differentiation between both types of ethanol. As a result of measures taken by ANP to avoid tax evasion, figures as of 2008 better reflect total hydrous ethanol consumption.

Brazilian Fuel Consumption Matrix (000 m3)						
	2010	2011	2012	2013	2014	2015 1/
Diesel *	49,239	52,264	55,900	58,572	60,032	28,052
Gasoline C**	29,844	35,491	39,698	41,426	44,364	20,438
Hydrated Ethanol	15,074	10,899	9,850	11,755	12,994	8,386

Source: ANP. * Diesel includes Bx Biodiesel as of 2008. ** Gasoline C includes 18-27.5% of anhydrous ethanol. 1/ 2015 refers to January-June.

As reported by ANP, gasoline consumption for January-June 2015 is 20.4 billion liters, a five percent decrease compared to the same period in 2014. The drop-in consumption is related to increased competitiveness for hydrated ethanol at the pump vis-à-vis gasoline due to the recent hike of CIDE and PIS/COFINS taxes, a larger supply of ethanol given that the sugarcane harvest season began early this year, and overall lower fuel consumption due to the current economic recession Brazil is experiencing. In fact, diesel consumption during January-June 2015 is 28 billion liters, down 2.5 percent from the same period in 2014.

Sales by fuel distributors as informed by ANP for 2014 and January-June 2015 are used as the baseline for ATO/Sao Paulo projections. Transport fuel projections assume a two percent negative growth for the 2015 Brazilian Gross Domestic Production (GDP), zero growth for the Brazilian economy in 2016 and a two percent average growth in the Brazilian GDP as of 2017. It also

assumes a uniform gasoline/ethanol price ration for the upcoming years. No information is available for diesel use breakdown.

Fuel Use Projections (Billion Liters)										
Calendar Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gasoline Total	42.15	42.99	43.85	44.73	45.62	46.53	47.46	48.41	49.38	50.37
Diesel Total	58.53	59.70	60.90	62.11	63.36	64.62	65.92	67.23	68.58	69.95
On-road	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Agriculture	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Construction/mining	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Shipping/rail	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Industry	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Heating	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Jet Fuel Total	7.28	7.43	7.58	7.73	7.88	8.04	8.20	8.37	8.53	8.70
Total Fuel Markets	42.15	42.99	43.85	44.73	45.62	46.53	47.46	48.41	49.38	50.37

Projected by ATO/Sao Paulo based on 2014 and Jan-June 2015 fuel sales as reported by the Petroleum, Natural Gas and Biofuels National Agency (ANP)

4. Ethanol

4.1. Brazilian Ethanol Production, Supply and Demand (PS&D) Tables

Ethanol is an alcohol made by fermenting sugar components of plant materials such as corn and wheat starch, sugarcane, sugarbeet, sorghum, and cassava. Sugarcane is the source of feedstock for ethanol production in Brazil. The tables below show the Brazilian ethanol supply and demand (PS&D) spreadsheets for "All Uses" and "Fuel Use Only" for calendar years 2011 through 2016. For more information on these tables, see Notes on Statistical Data – Ethanol (Section 7.1.).

ATO/Sao Paulo historically reported all figures related to the sugar-ethanol industry in marketing years (MY) and made necessary adjustments to convert from marketing to calendar years. The official Brazil marketing year for sugarcane, sugar and ethanol production as determined by the Brazilian government, remains May-April for the center-south producing states, although sugarcane crushing has started as early as late March and April in past years. The official marketing year for the north-northeast is September-August.

No Brazilian government entity or trade source maintains production figures on use "for fuel" or "other uses." All ethanol production figures are reported solely as hydrous and anhydrous volumes. According to ATO/Sao Paulo contacts, ethanol plants produce different specifications of hydrous and/or anhydrous, but make no distinction between fuel and other uses. The actual use for fuels and other uses (industrial, refined, or neutral) are determined at end-use.

Total Conventional Ethanol Production, Supply and Demand All Uses (million liters)						
CY	2011	2012	2013	2014	2015	2016
Begin Stocks	5,916	6,891	7,094	8,195	9,367	8,322
Fuel Begin Stocks	5,549	6,488	6,690	7,790	8,913	7,848

Production	22,893	23,509	27,642	28,553	29,350	30,680
Fuel	20,212	20,739	24,377	25,585	26,850	28,150
Other Uses	2,681	2,770	3,265	2,968	2,500	2,530
Imports	1,136	554	132	452	505	500
Fuel	1,100	553	131	403	485	480
Other Uses	36	1	1	49	20	20
Total Supply	29,945	30,954	34,868	37,200	39,222	39,502
Exports	1,964	3,055	2,917	1,398	1,300	1,350
Fuel	1,083	2,500	1,952	780	800	820
Other Uses	881	555	965	618	500	530
Consumption	21,090	20,805	23,756	26,435	29,600	30,000
Fuel	19,290	18,590	21,456	24,085	27,600	28,000
Other Uses	1,800	2,215	2,300	2,350	2,000	2,000
Ending Stocks	6,891	7,094	8,195	9,367	8,322	8,152
Fuel End Stocks	6,488	6,690	7,790	8,913	7,848	7,658
Total Demand	29,945	30,954	34,868	37,200	39,222	39,502
Production Capacity (Conventional)						
No. of Bio refineries	418	408	399	370	360	360
Capacity	42,800	41,600	40,700	39,700	38,000	38,000
Capacity Use (%)	53.5%	56.5%	67.9%	71.9%	77.2%	80.7%
Feedstock Use - Conventional (1,000 MT)						
Sugarcane	274,716	282,108	331,704	342,636	352,200	368,160
Fuel	242,544	248,868	292,524	307,020	322,200	337,800
Other Uses	32,172	33,240	39,180	35,616	30,000	30,360
Source: Prepared by ATO/Sao Paulo based on MAPA, SECEX, Datagro, ANP, UNICA and industry sources. Numbers for 2015 and 2016 are projections.						

4.2. Production

A. Production Estimates

ATO/Sao Paulo projections are based on industry sources. To be in accordance with the actual feedstock production cycle, the following narrative describes sugarcane and ethanol production in marketing years. ATO/Sao Paulo estimates the MY (April-March) 2015/16 Brazilian sugarcane crushing remains unchanged at 648 million MT, up three percent compared to MY 2014/15 (628.6 million MT). The center-south region is expected to harvest 590 million MT of sugarcane, a three percent increase from the previous season, due to increased area for harvest and a marginal increase in yields. Post projects north-northeast production for MY 2015/16 at 58 million MT, a four million MT increase compared to MY 2014/15. See [GAIN Report BR15002](#) – The Brazil Sugar Annual for further information about the sugarcane crop.

Total ethanol production for 2015 is estimated at 29.35 billion liters, up three percent from revised figure for 2014. Total ethanol for fuels production is estimated at 26.85 billion liters, up five percent from the previous calendar year.

Total sucrose (total reducing sugar, TRS) content destined for sugar and ethanol production during MY 2015/16 is estimated at 41.5 and 58.5 percent, respectively. The revised sugar-ethanol mix for MY 2014/15 is 43.5 and 56.5 percent. Sugar-ethanol mills are expected to divert more sugarcane to ethanol production in the current crop. The industry is expected to comply with the sugar export contracts and guarantee enough anhydrous ethanol production to blend with gasoline. Concurrently, ethanol plants are likely to steadily increase hydrous ethanol production

due to the increased competitiveness of this product at the pump compared to gasoline.

It is early to predict MY 2016/17 production. More accurate numbers should be available in the first quarter of 2016 with the development of feedstock from new sugarcane plantings and recovery from current harvested areas; in other words, sugarcane from second, third, fourth, fifth and older cuts; as well as projections for sugar and ethanol demand in both the domestic and international markets. Current production forecast is based on the assumption that regular weather conditions will prevail throughout the sugarcane production cycle in all producing regions.

Post projects sugarcane production for MY 2016/17 at 680 million MT, a five percent increase compared to the current crop, assuming historical stock renewal rates and agricultural yields. ATO/Sao Paulo projects 2016 total ethanol production at 30.68 billion liters, up five percent from 2015 assuming similar sugar/ethanol breakdown estimated for the current crop. Ethanol for fuel production is forecast at 28.15 billion liters for 2015, a 1.3 billion liter increase over 2015.

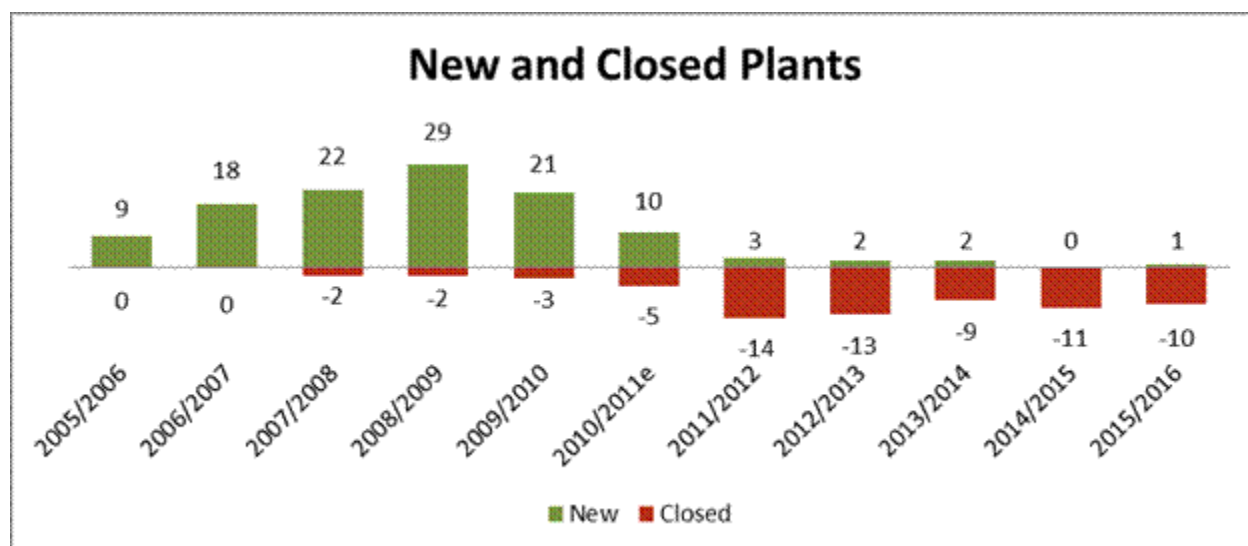
B. Industrial Capacity

Ethanol production capacity for 2015 is estimated at 38 billion liters, down 1.7 billion liters from 2014. This figure reflects the lower number of ethanol and sugar-ethanol plants in operation, estimates for the total sugarcane crushing capacity, the authorized hydrated ethanol production capacity of 205.682 m³/day as reported by ANP and an average of 185 crushing days.

Ethanol installed industrial capacity depends on annual decisions made by individual plants to produce sugar and/or ethanol. Post contacts report that the industry responds to the theoretical ratio of 40:60 to switch between sugar to ethanol production or vice versa from harvest to harvest. Once producing units adjust their plants to produce a set ratio of sugar/ethanol in a given year, there is much less flexibility to change it during the crushing season.

C. New Investments/Shut Down of Ethanol Plants

The total number of sugar-ethanol mills in 2015 is estimated at 360 units, whereas total operating units for 2014 was 370. Investments in new greenfield projects remain rare. UNICA estimates only one new plant should start operations in the current crop period. Concurrently, several units have been closed in the past couple of years mainly due to financial constraints. UNICA projects that 10 units should close operations this season. Note that some of the units have been acquired by larger and financially healthy groups. The graphs below show revised data for the evolution of new and closed ethanol and sugar-ethanol plants since MY 2005/06 as reported by UNICA.



The table below shows the financial situation of center-south mills as reported by UNICA. The figures are based on 155 mills which represent 60 percent of the center-south production. The ratio between the net debt and gross income has reached 103.30 percent in the 2013/14 crop. The net financial cost which is the expense to pay the interest rate from financial operations, increased on average R\$ 16.74/MT of sugarcane which represents roughly 15 percent of the gross income. For just over a quarter of the mills, the net financial cost hit 20 percent of gross income, putting the mill in a very critical financial position.

Crop	2011/12	2012/13	2013/14
Net Debt (R\$/ton)	125.74	129.97	129.43
Net Debt/Gross Income	98.40%	102.70%	103.30%
Net financial cost (R\$/ton)	15.99	15.92	16.74

Source: UNICA

D. Sugarcane and Ethanol Cost of Production and Prices Received by Producers

According to industry sources, sugarcane represents between 60 to 70 percent of the cost of producing ethanol. The National Agricultural Confederation (CNA) and Continued Education Program in Economics and Management of Enterprises (PECEGE) report that production costs for anhydrous ethanol for 2014/15 were estimated between at R\$ 1.54-1.59/liter depending on the efficiency of the plant.

Sugarcane prices received by third party suppliers for major producing states are based on a formula that takes into account prices for sugar and ethanol prices both in the domestic and international markets. The State of Sao Paulo Sugarcane, Sugar and Ethanol Growers Council (CONSECANA) was the first to develop this formula for the state of Sao Paulo, the major producing state comprising roughly 60 percent of the Brazilian production.

The state of Sao Paulo Sugarcane, Sugar and Alcohol Growers Council (CONSECANA) reports that the average sugarcane price (April 2014-March 2015) for the state of Sao Paulo for the 2014/15

crop was R\$ 0.4763 per kg of TRS, or R\$65.06 per ton of sugarcane, up R\$ 4.09 per ton compared to the 2013/14 crop (R\$0.4573 per kg of TRS, or R\$60.97 per ton of sugarcane), due to higher industrial yield and higher prices paid for sugar and ethanol during the crushing season compared the previous year. Note that CONSECANA's prices are based on both sugar and ethanol prices in domestic and international markets. Consecana prices for the 2015/16 crop have not been released to the public yet.

The Ethanol Indexes released by the University of Sao Paulo's College of Agriculture "Luiz de Queiroz" (ESALQ) follow. The indexes track anhydrous and hydrous ethanol for fuel prices received by producers in the domestic spot market. CEPEA monthly ethanol price index series are no longer available as of May 2015. However, the institution continues to report the weekly index. Therefore, Post will continue to report the price index for a given month based on the weekly index for the last week of that particular month.

Price for Fuel Hydrated Ethanol - State of São Paulo (R\$/000 liters).					
Period	2011	2012	2013	2014	2015 1/
January	1109.40	1159.00	1144.60	1284.80	1325.60
February	1176.10	1119.80	1232.00	1368.60	1384.70
March	1421.90	1204.40	1226.40	1419.50	1261.30
April	1387.50	1191.40	1244.30	1338.50	1261.60
May	1005.90	1140.10	1110.20	1200.90	1206.40
June	1113.70	1082.80	1140.20	1214.90	1188.80
July	1136.80	1059.90	1114.50	1229.10	1192.60
August	1193.00	1041.70	1088.60	1207.00	
September	1204.60	1062.40	1148.50	1200.60	
October	1229.70	1010.60	1164.00	1138.30	
November	1277.00	1095.90	1204.70	1218.20	
December	1250.10	1132.50	1281.10	1265.50	

Source: USP/ESALQ/CEPEA.

Price for Fuel Anhydrous Ethanol - State of São Paulo (R\$/000 liters).					
Period	2011	2012	2013	2014	2015 1/
January	1233.20	1270.30	1302.50	1456.10	1458.20
February	1293.10	1184.60	1352.70	1520.50	1552.50
March	1596.60	1278.80	1374.50	1610.20	1420.40
April	2375.00	1259.70	1394.80	1522.00	1401.50
May	1380.70	1294.30	1329.10	1366.40	1377.70
June	1244.60	1234.00	1285.20	1359.20	1358.90
July	1298.90	1232.50	1271.20	1373.90	1371.10
August	1352.80	1198.70	1227.30	1346.00	
September	1384.20	1198.90	1277.10	1362.40	
October	1378.50	1140.00	1315.40	1290.00	
November	1377.30	1234.90	1342.80	1329.90	
December	1359.20	1287.20	1440.00	1407.10	

Source: USP/ESALQ/CEPEA.

4.3. Consumption

Brazil is an important user of ethanol for fuel consumption. Total domestic demand for ethanol for calendar year 2016 is forecast at 30 billion liters, up 400 million liters relative to the revised figure for 2015 (29.6 billion liters), based on the current recession in the economy and expected zero growth of Brazilian GDP for 2016.

Total ethanol consumption for use as fuel is estimated at 27.6 billion liters for 2015, up 3.5 billion liters compared to the previous year due to the increased ethanol-use mandate since March 2015, improved competitiveness of hydrous ethanol compared to gasoline at the pump as a result of the bump of CIDE and PIS/COFINS taxes for gasoline, and the reduction of ICMS in the state of Minas Gerais coupled with an increase of the ICMS on gasoline for Minas Gerais, Parana, and Bahia. (see *2.1. Government Support Programs for Ethanol*)

Consumer decisions are driven by the ratio between ethanol and gasoline prices. The 70 percent ratio between ethanol and gasoline prices is the rule of thumb in determining whether flex car owners will choose to fill up with ethanol (price ratio below 70 percent) or gasoline (price ratio above 70 percent). The harvest season started in April and the price ratio between ethanol and gasoline was already favorable for ethanol in the initial crushing months. ATO/Sao Paulo expects ethanol prices to remain favorable through the end of the calendar year.

The tables below show ethanol and gasoline prices as well as the price ratio for selected states, cities, and months. Note that in June 2015, purchasing ethanol was more cost effective in the state of Minas Gerais and the cities Belo Horizonte and Goiania, where gasoline is traditionally the best economic option for fueling due to logistic advantages and preferential state taxes.

Gasoline and Ethanol Prices in Selected States (average price, R\$/liter)									
		Gasoline				Ethanol			
		2012	2013	2014	2015	2012	2013	2014	2015
Sao Paulo State	Jan	2.649	2.644	2.835	2.918	1.888	1.829	1.909	1.935
	Feb	2.641	2.767	2.837	3.150	1.818	1.875	1.946	2.101
	Jun	2.636	2.726	2.868	3.128	1.805	1.787	1.902	1.969
	Aug	2.261	2.705	2.856		1.747	1.741	1.874	
Sao Paulo City	Jan	2.647	2.628	2.803	2.878	1.874	1.818	1.903	1.914
	Feb	2.630	2.739	2.800	3.100	1.801	1.869	1.935	2.069
	Jun	2.630	2.699	2.835	3.074	1.786	1.751	1.869	1.935
	Aug	2.605	2.674	2.674		1.722	1.718	1.841	
Minas Gerais	Jan	2.824	2.824	2.976	3.025	2.208	2.095	2.134	2.198
	Feb	2.817	2.923	2.963	3.304	2.166	2.125	2.149	2.363
	Jun	2.806	2.903	2.952	3.366	2.142	2.105	2.210	2.232
	Aug	2.801	2.875	2.969		2.110	2.035	2.173	
Belo Horizonte (MG Capital)	Jan	2.761	2.740	2.859	2.902	2.172	2.083	2.098	2.135
	Feb	2.746	2.824	2.847	3.225	2.128	2.106	2.110	2.312
	Jun	2.741	2.782	2.851	3.296	2.127	2.065	2.155	2.244
	Aug	2.718	2.732	2.846		2.094	1.947	2.115	
Rio Janeiro State	Jan	2.850	2.898	3.082	3.214	2.266	2.243	2.352	2.500
	Feb	2.846	3.002	3.085	3.453	2.257	2.268	2.378	2.662
	Jun	2.854	3.005	3.132	3.516	2.256	2.303	2.468	2.649
	Aug	2.849	2.994	3.128		2.206	2.257	2.454	
Rio Janeiro Capital	Jan	2.818	2.866	3.052	3.187	2.257	2.231	2.340	2.485
	Feb	2.810	2.967	3.056	3.433	2.236	2.251	2.372	2.661
	Jun	2.821	2.974	3.109	3.490	2.253	2.280	2.451	2.624
	Aug	2.813	2.959	3.098		2.185	2.231	2.430	
Porto Alegre (RS Capital)	Jan	2.738	2.695	2.897	2.967	2.372	2.316	2.387	2.389
	Feb	2.689	2.847	2.882	3.297	2.348	2.336	2.396	2.586
	Jun	2.657	2.751	2.884	3.289	2.390	2.396	2.384	2.491
	Aug	2.663	2.760	2.872		2.360	2.387	2.337	
Goiania (GO Capital)	Jan	2.831	2.743	3.136	3.220	1.959	1.937	2.225	2.181
	Feb	2.782	2.836	3.111	3.431	1.899	1.951	2.175	2.339
	Jun	2.672	2.794	3.085	3.170	1.856	1.849	2.100	1.974
	Aug	2.638	2.784	3.134		1.773	1.811	2.166	
Fortaleza (CE Capital)	Jan	2.551	2.675	2.891	3.151	2.076	2.220	2.335	2.572
	Feb	2.660	2.850	2.879	3.347	2.077	2.280	2.342	2.601
	Jun	2.564	2.856	2.952	3.370	2.163	2.337	2.471	2.609
	Aug	2.685	2.780	2.984		2.162	2.332	2.491	

Source: Petroleum, Natural Gas and Biofuels National Agency (ANP).

Ratio Ethanol/Gasoline Prices					
		2012	2013	2014	2015
Sao Paulo State	Jan	71%	69%	67%	66%
	Feb	69%	68%	69%	67%
	Jun	68%	66%	66%	63%
	Aug	77%	64%	66%	
Sao Paulo City	Jan	71%	69%	68%	67%
	Feb	68%	68%	69%	67%
	Jun	68%	65%	66%	63%
	Aug	66%	64%	69%	
Minas Gerais	Jan	78%	74%	72%	73%
	Feb	77%	73%	73%	72%
	Jun	76%	73%	75%	66%
	Aug	75%	71%	73%	
Belo Horizonte (MG Capital)	Jan	79%	76%	73%	74%
	Feb	77%	75%	74%	72%
	Jun	78%	74%	76%	68%
	Aug	77%	71%	74%	
Rio Janeiro State	Jan	80%	77%	76%	78%
	Feb	79%	76%	77%	77%
	Jun	79%	77%	79%	75%
	Aug	77%	75%	78%	
Rio Janeiro Capital	Jan	80%	78%	77%	78%
	Feb	80%	76%	78%	78%
	Jun	80%	77%	79%	75%
	Aug	78%	75%	78%	
Porto Alegre (RS Capital)	Jan	87%	86%	82%	81%
	Feb	87%	82%	83%	78%
	Jun	90%	87%	83%	76%
	Aug	89%	86%	81%	
Goiania (GO Capital)	Jan	69%	71%	71%	68%
	Feb	68%	69%	70%	68%
	Jun	69%	66%	68%	62%
	Aug	67%	65%	69%	
Fortaleza (CE Capital)	Jan	81%	83%	81%	82%
	Feb	78%	80%	81%	78%
	Jun	84%	82%	84%	77%
	Aug	81%	84%	83%	

Source: Petroleum, Natural Gas and Biofuels National Agency (ANP).

Gray Area means gasoline prices more attractive than ethanol

The size of the Brazilian light vehicle fleet also plays a role in encouraging ethanol consumption. The fleet is estimated at 35.8 million units in 2015 and pure hydrous ethanol and flex fuel powered vehicles together represent approximately 68 percent (24.2 million units) of the total fleet. The motorcycle fleet is estimated at 15.3 million units including 4 million flex-fuel units.

The table below shows the licensing of flex fuel vehicles (FFV) and hydrous ethanol powered cars, as reported by the Brazilian Association of Vehicle Manufacturers (ANFAVEA). Sales of FFV

currently represent over 90 percent of total monthly vehicle sales. The slowdown of the Brazilian economy in 2015 has sharply affected the purchasing of new flex-fuel cars. ANFAVEA estimates an over 20 percent drop on sales in 2015 compared to 2014.

Licensing of Ethanol Powered Vehicles (pure ethanol & flex fuel units)						
2009	2010	2011	2012	2013	2014	2015
2,711,267	2,876,173	2,848,071	3,162,824	3,169,111	2,940,508	1,121,890

Source: National Association of Vehicle Manufacturers (ANFAVEA) 1/ January-June

4.4. Trade

A. Exports

Brazilian total ethanol exports for 2016 are forecast at 1.35 million liters, similar to 2015 (1.3 million). Fuel ethanol exports are projected up at 820 million liters. The U.S. Environmental Protection Agency (EPA) announced in May 2015 the proposed volumes for 2014, 2015, 2016 for the Renewable Fuels Standards (RFS) which are lower than the original volumes set by legislation. According to industry sources, this move by EPA will likely hurt Brazilian ethanol exports to the United States.

The tables below show ethanol exports (NCM 2207.10 through 2207.20.19) for 2014 and 2015 (January-June), as reported by the Brazilian Secretariat of Foreign Trade (SECEX).

Brazilian Ethanol Exports (NCM 2207.10, 2207.20.11 & 2207.20.19, MT, 000 Liters, US\$ 1,000 FOB)						
	CY 2014			CY 2015 1/		
Country	Volume	Weight	Value	Volume	Weight	Value
United States	728,053	575,386	488,029	312,094	246,912	170,835
South Korea	417,059	336,963	249,368	150,207	121,325	78,905
Japan	91,160	72,531	60,384	31,956	25,224	18,324
Nigeria	45,894	37,015	27,129	9,570	7,730	4,631
Taiwan	29,965	24,223	18,229	0	0	0
Angola	15,427	12,419	9,992	3,861	3,060	2,769
Ghana	15,005	12,077	9,787	3,910	3,146	2,201
Singapore	16,079	13,000	8,417	0	0	0
Mexico	9,004	7,249	6,124	24	19	30
Switzerland	8,097	6,527	5,597	0	0	0
Others	22,171	17,869	14,975	29,600	23,641	16,122
Total	1,397,915	1,115,261	898,031	541,221	431,058	293,818

Source : Brazilian Foreign Trade Secretariat (SECEX)

Note: Numbers may not add due to rounding 1/Jan-June.

B. Imports

Brazilian total ethanol imports for 2016 are projected at 500 million liters, almost exclusively for fuel use. Total imports for 2015 are estimated at 505 million liters. The tables below show ethanol imports (NCM 2207.10 through 2207.20.19) for 2014 and 2015 (January-June), as reported by the Brazilian Secretariat of Foreign Trade (SECEX).

Brazilian Ethanol Imports (NCM 2207.10, 2207.20.11 & 2207.20.19, MT, 000 Liters, US\$ 1,000 FOB)						
	CY 2014			CY 2015 1/		
Country	Volume	Weight	Value	Volume	Weight	Value
United States	402,692	317,803	211,040	448,000	361,805	227,231
Peru	17,002	13,411	10,173	0	0	0
United Kingdom	12,998	10,246	7,342	0	0	1
Paraguay	5,159	4,109	2,690	4,070	3,221	1,917
Jamaica	318	268	1,116	145	123	533
Germany	34	36	370	9	13	88
Mexico	31	25	191	3	2	19
Poland	72	60	109	47	39	61
Guyana	21	20	77	0	0	0
Others	13,677	10,772	8,291	13,185	10,404	6,998
Total	452,003	356,751	241,399	465,458	375,608	236,847
Source : Brazilian Foreign Trade Secretariat (SECEX)						
Note : Numbers may not add due to rounding 1/Jan - June						

4.5. Ending Stocks

Beginning stocks for ethanol for "All Uses" are based on information from MAPA and reflect all stocks at ethanol plants on January 1, 2006. Beginning stocks for ethanol "For Fuel Only" are estimated based on historical average use of bioethanol for fuel/other uses.

On average, ethanol for fuel has represented 87 percent of total ethanol disappearance (consumption and exports), therefore Post assumed this percentage to calculate the theoretical beginning stocks for fuel in January 1, 2006. All other stock figures were calculated based on the difference between total supply and disappearance.

ATO/Sao Paulo projects ending stocks for fuel ethanol at 7.66 billion liters for 2016, down 190 million liters from 2015. Ending stocks measured on December 31 of each year do not actually reflect the supply and demand balance. In general, ethanol plants in the center-south are nearing the end of the crushing season, while ethanol plants in the northeast are fully operating. As a result, stock levels are expected to be high.

Stock figures measured on April 1, after subtracting the disappearance (consumption and exports) during the first quarter of the year, will likely show a more realistic picture about product availability in the beginning of the new crop season (April).

4.6. Market for Ethanol Used as Other Industrial Chemicals

The table below shows the Brazilian ethanol supply and demand (PS&D) spreadsheet for "Other Uses" for calendar years 2011 through 2016. Ethanol for "other uses" is used by companies for chemicals, cosmetics, etc. It is common that "ethanol refineries" purchase hydrous/anhydrous ethanol to reprocess and resell to smaller businesses. During the reprocessing, these plants change the original specifications of the product to meet customer requirements.

Ethanol Used as Other Industrial Chemicals (million liters)

CY	2011	2012	2013	2014	2015	2016
Beginning Stocks	2,754	2,790	2,791	2,832	2,872	2,872
Production	2,681	2,770	3,265	2,968	2,500	2,530
Imports	36	1	1	49	20	20
Exports	881	555	965	618	500	530
Consumption	1,800	2,215	2,300	2,350	2,000	2,000
Ending Stocks	2,790	2,791	2,792	2,881	2,892	2,892
Production Capacity (Conventional Fuel)						
No. of Bio refineries	418	408	399	370	360	360
Capacity	5,012	4,902	4,807	4,127	3,237	3,134
Capacity Use (%)	53.5%	56.5%	67.9%	71.9%	77.2%	80.7%
Source: Prepared by ATO/Sao Paulo based on MAPA, SECEX, Datagro, ANP, UNICA and industry sources. Numbers for 2015 and 2016 are projections.						

The Ethanol – Other Uses Indexes released by the University of Sao Paulo’s College of Agriculture "Luiz de Queiroz" (ESALQ) follow. The indexes track anhydrous and hydrous ethanol for “other uses” prices received by producers in the domestic spot market. CEPEA monthly ethanol price index series are no longer available as of May 2015. However, the institution continues to report the weekly index. Therefore, Post will continue to report the price index for a given month based on the weekly index for the last week of that particular month.

Price for Hydrated Ethanol - Other Uses: State of São Paulo (R\$/000 liters).					
Month	2011	2012	2013	2014	2015 1/
January	1,122.50	1,186.40	1,160.40	1,333.40	1,338.80
February	1,182.10	1,154.60	1,203.20	1,378.80	1,411.60
March	1,443.10	1,211.70	1,234.00	1,483.50	1,309.90
April	1,424.80	1,217.90	1,277.40	1,409.70	1,296.30
May	1,054.70	1,176.00	1,168.00	1,246.00	1,231.70
June	1,078.80	1,114.80	1,170.00	1,247.10	1,215.30
July	1,165.90	1,101.20	1,158.80	1,257.60	1,207.90
August	1,234.00	1,078.20	1,106.90	1,233.90	
September	1,207.10	1,104.30	1,160.10	1,250.00	
October	1,259.60	1,060.00	1,188.10	1,176.80	
November	1,296.20	1,127.40	1,212.00	1,267.80	
December	1,275.30	1,157.70	1,311.90	1,304.80	
Source: USP/ESALQ/CEPEA.					
Price for Anhydrous Ethanol - Other Uses: State of São Paulo (R\$/000 liters).					
Month	2011	2012	2013	2014	2015 1/
January	1,122.50	1,350.30	1,371.20	1,477.60	1,482.60
February	1,182.10	1,248.80	1,368.10	1,523.40	1,508.00
March	1,443.10	1,297.80	1,363.70	1,596.50	1,417.60
April	1,424.80	1,321.20	1,401.30	1,535.80	1,415.10
May	1,054.70	1,331.40	1,376.20	1,387.20	1,377.70
June	1,078.80	1,340.70	1,320.40	1,372.70	1,358.90
July	1,165.90	1,315.00	1,335.10	1,390.70	1,371.11
August	1,234.00	1,277.80	1,284.50	1,354.50	
September	1,207.10	1,286.10	1,289.20	1,381.30	

October	1,259.60	1,194.10	1,340.90	1,356.90	
November	1,296.20	1,252.20	1,387.70	1,377.40	
December	1,275.30	1,334.60	1,477.80	1,445.90	

Source: USP/ESALQ/CEPEA.

5. Biodiesel

Biodiesel is a trans-esterified vegetable oil also known as fatty acid methyl ester produced from soy oil, cottonseed oil, rapeseed, oil, other vegetable oils, animal fats, and recycled cooking oils.

5.1. Brazilian Biodiesel Production, Supply and Demand (PS&D) Table

The table below shows Brazil's biodiesel supply and demand (PS&D) table for calendar years (CY) 2011 through 2016.

Biodiesel (Million Liters)						
Calendar Year	2011	2012	2013	2014	2015	2016
Beginning Stocks	60	132	54	47	57	50
Production	2,673	2,717	2,960	3,460	4,100	4,107
Imports	18	0	0	0	0	0
Exports	6	0	39	40	10	20
Consumption	2,613	2,795	2,928	3,410	4,097	4,097
Ending Stocks	132	54	47	57	50	40
Production Capacity						
Number of Bio refineries	65	65	64	58	57	57
Nameplate Capacity	6,742	7,400	7,900	7,722	7,860	7,860
Capacity Use (%)	39.6%	36.7%	37.5%	44.8%	52.2%	52.3%
Feedstock Use (1,000 mt)						
Soybean for Crush	8,894	9,295	9,858	11,362	14,208	14,045
Cottonseed for Crush	848	720	314	367	217	218
Animal Fat	401,994	434,266	584,320	780,598	924,986	810,745
Market Penetration (Million Liters)						
Biodiesel, on-road use	2,673	2,717	2,960	3,460	4,100	4,107
Diesel, on-road use	n/a	n/a	n/a	n/a	n/a	n/a
Blend Rate (%)	n/a	n/a	n/a	n/a	n/a	n/a
Diesel, total use	52,264	55,900	58,572	60,032	58,531	58,531

5.2. Production

A. Feedstock

Biodiesel can be produced from several raw materials such as soybeans, cottonseed, animal fat, castor seed (*Ricinus communis*), African palm oil ("dendê"), "pinhao manso" (*Jatropha curcas*), sunflower, peanut, fried oil or others.

According to updated information reported by the Petroleum, Natural Gas and Biofuels National Agency (ANP), soybeans currently represents 76 percent of total biodiesel feedstock, followed by animal tallow (21 percent) and cottonseed (1 percent). The table below shows biodiesel

production by raw material according to ANP and the Brazilian Association of Vegetable Oil Industry (ABIOVE).

Biodiesel Production by Raw Material (m3)						
Raw Material	2010	2011	2012	2013	2014	2015 1/
Soybean Oil	1,960,822	2,152,298	2,041,667	2,142,990	2,551,813	960,332
Animal Tallow	330,574	367,578	481,231	611,215	731,935	271,160
Cottonseed	57,458	84,711	123,247	65,960	81,666	16,485
Others	37,586	68,174	71,338	97,331	54,424	22,414
Total	2,386,438	2,672,760	2,717,483	2,917,495	3,419,838	1,270,391

Source: ANP/ABIOVE. 1/ 2015 data refers to January to April.

The tables below show official USDA data for soy and cotton oil production for MY 2011/12 through 2014/15, as well as a projection for MY 2015/16.

Brazilian Soybeans and Products Production (000 hectares, 000 metric tons)					
	2011/12	2012/13	2013/14	2014/15	2015/16
Area harvested	25,000	27,700	30,100	31,500	32,500
Soybeans	66,500	82,000	86,700	94,500	97,000
Soybeans for crushing	38,083	35,235	36,861	39,300	39,500
Meal, Soybean	29,510	27,310	28,540	30,420	30,570
Oil, Soybean	7,310	6,760	7,070	7,540	7,580

Source: USDA/FAS

Brazilian Cotton and Products Production (000 hectares, 000 metric tons)					
	2011/12	2012/13	2013/14	2014/15	2015/16
Area Harvested	1,400	900	1,120	975	950
Seed Cotton 1/	4,857	3,350	4,466	3,958	3,769
Lint Cotton	1,894	1,306	1,742	1,524	1,470
Cottonseed	2,750	2,100	2,400	2,250	2,200
Meal, Cottonseed	1,350	1,030	1,178	1,105	1,080
Oil, Cottonseed	455	347	396	371	363

Source: USDA/FAS 1/ Seed cotton calculated based on average lint yields.

B. Production Estimates

Biodiesel production remains regulated by the government. Biodiesel production in 2014 was 3.46 billion liters, a 17 percent increase from 2013 supported by the increase of the biodiesel use mandate to from 5 to 6 percent between July and October 2014 and to 7 percent as of November 2014. According to ANP, cumulative January-May 2015 production is approximately 1.6 billion liters. Biodiesel production is reported below.

Brazilian Biodiesel Monthly Production/Deliveries (000 liters)						
Month	2010	2011	2012	2013	2014	2015 1/

January	147,435	186,327	193,006	226,505	245,215	319,546
February	178,049	176,783	214,607	205,738	240,529	303,594
March	214,150	233,465	220,872	230,752	271,839	322,692
April	184,897	200,381	182,372	253,591	253,224	324,526
May	202,729	220,484	213,021	245,934	242,526	338,851
June	204,940	231,573	214,898	236,441	251,517	---
July	207,434	249,897	230,340	260,671	302,971	---
August	231,160	247,934	254,426	247,610	314,532	---
September	219,988	233,971	252,243	252,714	312,665	---
October	199,895	237,885	251,416	277,992	321,603	---
November	207,868	237,189	245,321	265,176	315,448	---
December	187,856	216,870	244,962	214,364	347,769	---
Total	2,386,399	2,672,760	2,717,483	2,917,488	3,419,838	1,609,210

Source: ANP.

In 2016, total Brazilian biodiesel production is projected at 4.11 billion liters, similar to the revised estimate for 2015 (4.1 billion liters). The projections take into account the current recession of the Brazilian economy and the consequent decrease of diesel consumption, according to updated information released by ANP. The agency reports a total 28 billion liters of diesel consumed between January and June 2015, down 2.5 percent from the same period in 2014.

ANP reports that as of May 2015, Brazil has 56 plants authorized to produce biodiesel. Current authorized industrial capacity is estimated at 20.72 million liters/day or approximately 7.46 billion liters/year, based on a 360 day operation cycle. This represents approximately 2.19 times the mandatory biodiesel production to be blended in mineral diesel in 2014; and a five percent decrease compared to the authorized industrial capacity for the same period in 2014 (21.8 million liters/day).

ATO/Sao Paulo projects a total of 57 biodiesel plants for both 2015 and 2016 with an industrial capacity of 7.86 billion liters per year (21.83 million liters/day), up five percent from current industrial capacity. Projections are based on information for authorized plants and requests for authorization provided by ANP and industry sources.

C. Cost of Production and Market Prices

The biodiesel market remains regulated by the government through a public auction system (see GAIN Reports [BR10006](#) and [BR11013](#) – Brazilian Biofuels Annual Reports for more information) which gives preference to producers with the Social Fuel Stamp. The Social Fuel Stamp provides incentives for poorer farmers (family farmers) in disadvantaged areas.

The tables below update the results of the 33rd through the 36th auctions from October 2013 to April 2014 as well as provides information for the 37th through 43rd auctions from June 2014 to June 2015. Additional auctions should take place in the upcoming months to guarantee supply for the remaining months of the year.

Biodiesel Auctions				
Auction	33rd Auction	34th Auction	35th Auction	36th Auction
Date	Oct-13	Dec-14	Feb-14	Apr-14
Number of Suppliers	40	39	36	33

Offered Quantity (m3)	739,400	588,700	699,278	735,227
Purchased Quantity (m3)	521,546	485,636	549,666	463,870
Opening/Reference Price (R\$/m3)	2320.00-2565.00	2265.00-2515.00	2265.00-2515.00	2350.00-2600.00
Average Price (R\$/m3) 1/	1,976.40	2,090.45	1,965.37	1,880.25
Delivery Date	Nov-Dec/13	Jan-Feb/14	Mar-Apr/14	May-Jun/14
Source: ANP 1/ Price FOB, including PIS/PASEP and COFINS, excluding ICMS, including Petrobras margin.				

Biodiesel Auctions				
Auction	37th Auction	38th Auction	39th Auction	39th Auction 2/
Date	June-14	Aug-14	Oct-14	Nov-14
Number of Suppliers	35	39	36	17
Offered Quantity (m3)	814,987	739,040	702,420	76,064
Purchased Quantity (m3)	638,455	625,732	645,230	56,184
Opening/Reference Price (R\$/m3)	2115.00-2365.00	1975.00-2225.00	2010.00-2290.00	2010.00-2290.00
Average Price (R\$/m3) 1/	1,884.15	1,913.71	2,104.61	2,051.84
Delivery Date	July-Aug/14	Sept-Oct/14	Nov-Dec/14	Dec-14
Source: ANP 1/ Price FOB, including PIS/PASEP and COFINS, excluding ICMS, including Petrobras margin. 2/ Supplemental auction.				

Biodiesel Auctions				
Auction	40th Auction	41th Auction	42th Auction	43th Auction
Date	Dec-14	Feb-15	Apr-15	Jun-15
Number of Suppliers	38	37	34	33
Offered Quantity (m3)	764,560	810,980	824,680	824,967
Purchased Quantity (m3)	667,876	699,354	671,288	661,545
Opening/Reference Price (R\$/m3)	2206.00-2520.00	2350.00-2650.00	2390.00-2675.00	2350.00-2650.00
Average Price (R\$/m3) 1/	2,194.47	1,975.15	2,021.78	2,171.77
Delivery Date	Jan-Feb/15	Mar-Apr/15	May-Jun/15	July-Aug/15
Source: ANP 1/ Price FOB, including PIS/PASEP and COFINS, excluding ICMS, including Petrobras margin.				

Biodiesel prices received by producers are determined by the public auction system (see Average Price in the tables above). The government sets the opening/reference price for different Brazilian regions and biodiesel producers bid for the lowest price. Producers are not allowed to change the sales price set at the auctions and consequently must search for low cost raw material or hedge their activities to offset risk.

Industry sources report that raw materials represent approximately 80 percent of biodiesel production cost whereas other inputs such as methanol, additives and catalyzers represent 10 percent of the total cost. Given that over 75 percent of biodiesel production still results from the use of soybean oil, the profitability of the sector is highly dependent on oilseed prices.

The tables below show the price for soybean oil in 2014 and 2015 (January-June). The average crude price in the state of Sao Paulo is R\$2,250/ton for January-June 2015, similar to the same period in 2014 (R\$2,235/ton).

Soybean Oil, Crude - Prices (2014)						
Location	Jan	Feb	Mar	Apr	May	Jun
Chicago (US\$/ton)	835	876	935	937	894	873
Premium (US\$/ton)	-3	10	-36	-34	-17	12
Port of Paranaguá - Fob (US\$/ton)	832	887	899	904	877	885
São Paulo - (US\$/ton com ICMS 12%)	918	976	1,032	971	982	997

Elaborated by ABIOVE based on several sources. Figures for Sao Paulo were converted to US\$/ton based on exchange rate for the last day of the month.

Soybean Oil, Crude - Prices (2014)						
Location	Jul	Aug	Sep	Oct	Nov	Dec
Chicago (US\$/ton)	815	746	717	724	727	707
Premium (US\$/ton)	42	53	37	42	40	15
Port of Paranaguá - Fob (US\$/ton)	857	799	754	766	767	721
São Paulo - (US\$/ton com ICMS 12%)	933	960	879	906	880	841

Elaborated by ABIOVE based on several sources. Figures for Sao Paulo were converted to US\$/ton based on exchange rate for the last day of the month.

Soybean Oil, Crude - Prices (2015)						
Location	Jan	Feb	Mar	Apr	May	Jun
Chicago (US\$/ton)	709	695	689	690	716	743
Premium (US\$/ton)	31	25	-29	-19	-1	-36
Port of Paranaguá - Fob (US\$/ton)	740	720	660	671	716	707
São Paulo - (US\$/ton com ICMS 12%)	840	779	693	742	705	754

Elaborated by ABIOVE based on several sources. Figures for Sao Paulo were converted to US\$/ton based on exchange rate for the last day of the month.

5.3. Consumption

Biodiesel domestic consumption remains regulated by GOB, thus the sector must comply with the biodiesel mandate which requires all mineral diesel to have a seven percent biodiesel blend (B7) as of November 1 2014. Based on industry projections for mineral diesel domestic demand, ATO/Sao Paulo forecasts total biodiesel domestic consumption for both 2015 and 2016 at 4.10 billion liters.

Biodiesel consumption for 2014 is estimated at 3.41 billion liters based on mineral diesel consumption of 60.03 billion liters. This represents a 16 percent increase compared to 2013 due to the increase of the biodiesel blend to B6 in July 1 and B7 in November 1, 2014.

5.4. Trade

Export figures by country of destination for biodiesel (NCM 3826.00.00) for the years 2013, 2014 and 2015 (January-June), according to SECEX, are shown below. No import has been registered under tariff code NCM 3826.00.00.

Brazilian Biodiesel Exports by Country of Destination (kg, US\$ FOB)						
	CY 2013		CY 2014		CY 2015 1/	
Country	Quantity	Value	Quantity	Value	Quantity	Value
Spain	23,330,227	22,570,900	13,164,940	12,506,693	0	0
Netherlands	7,018,564	6,435,103	12,068,340	11,428,700	0	0
Belgium	3,990,755	3,769,171	0	0	0	0
United States	0	0	9,179	66,453	0	0
Gibraltar	0	0	10,024,518	9,974,430	0	0
Japan	0	0	71	7,108	0	0
Total	34,339,546	32,775,174	35,267,048	33,983,384	0	0

Source : Brazilian Secretariat of Foreign Trade SECEX - Note: NCM 3826.00.00 - 1/ Jan-June

5.5. Stocks

ATO/Sao Paulo forecasts biodiesel ending stocks for 2016 at 50 million liters, down 10 million liters from 2015 (60 million liters), based on the difference between total supply and disappearance (consumption and exports).

6. Advanced Biofuels

Although Brazil started the production of advanced biofuels in 2014, it is not yet economically feasible to produce on a large scale due to the high cost of the technology to produce cellulosic ethanol, the cost of the enzymes used in the process, among others.

Bioflex 1 is the first cellulosic ethanol plant from Granbio. The plant is located in the state of Alagoas and has a production capacity of 82 million liters. Granbio reports that the raw material for ethanol production includes sugarcane bagass and straw. Granbio inaugurated the plant in 2014 and it is in the commissioning phase.

In July 2015, Raizen inaugurated its first cellulosic ethanol plant, although initial operations started in late 2014. The plant is located in the state of Sao Paulo and has a 42.2 million liter of ethanol production capacity. Investments totaled over R\$ 237 million and were partially funded by BNDES. Raizen also announced future investments of R\$ 2.5 billion to operate a total of eight cellulosic ethanol plants by 2024.

The company expects to produce 10 million liters of ethanol in 2015. Raizen also announced that has set export contracts to export cellulosic ethanol to Europe at a R\$ 300.00/m³ premium compared to conventional ethanol due to strong demand for the product as it is environmentally cleaner.

Raizen reports that high capex and enzyme costs remain and as a result, the cellulosic ethanol should be competitive in a four year period. Major difficulties in this initial operational phase include the adaptation and maintenance of the imported machinery; equipment management and equipment erosion/corrosion.

Centro de Tecnologia Canavieira started the commission phase of the demonstration plant located in the state of Sao Paulo with projected production of three million liters in 2015.

The National Bank for Social and Economic Development (BNDES) has supported the development of agricultural research (genetic modified plants, sugarcane seeds to replace current feedstocks used for planting, mechanization, etc.), and development for the sugar-ethanol sector, including investments in advanced biofuels through "Paiss Agricola". The program funded a total of R\$ 1.9 billion in 2014.

In late 2014, BNDES approved a total of R\$ 592.1 million to finance Abengoa Bioenergia Agroindustria's project to build a second generation ethanol plant.

7. Notes on Statistical Data

7.1. Ethanol

Beginning stocks for the ethanol for "All Uses" table is based on information from the Ministry of Agriculture, Livestock and Supply (MAPA) and reflect all stocks at the ethanol plants as of January 1, 2006. Beginning Stocks for the ethanol "For Fuel Only" table is estimated based on historical average use of bioethanol for fuel/other uses. On average, ethanol for fuel has represented 87 percent of the total ethanol disappearance (use), therefore Post assumed this percentage to calculate the theoretical beginning stocks for fuel in January 1, 2006. All other stock figures were calculated based on the difference between total supply and disappearance (consumption and exports).

Ethanol production estimates for "All Uses" were provided by MAPA and are consistent with previous ATO/Sao Paulo GAIN reports submitted by marketing year. Production estimates "For Fuel Only" are taken as the difference between "production for All Uses" minus estimates for "disappearance for other uses" (domestic consumption and exports) given that all Brazilian official publications and industry sources report production in hydrous/anhydrous ethanol only.

Trade figures were based on the Brazilian Secretariat of Foreign Trade (SECEX). SECEX breaks down trade numbers in four categories as described below:

- NCM 2207.10.10 – undenatured ethylic alcohol with ethanol content equal or over 80 percent. With water content equal or below 1 percent vol. Undenatured alcohol is defined as pure ethanol with no additives and suitable for consumption.
- NCM 2207.10.90 - undenatured ethylic alcohol with ethanol content equal or over 80 percent. Others. Undenatured alcohol is defined as pure ethanol with no additives and suitable for consumption.
- NCM 2207.20.11 - denatured ethylic alcohol with any ethanol content. With water content equal or below 1 percent vol. Denatured alcohol is defined as [ethanol](#) with additives which make it [poisonous](#) and/or unpalatable, thus, no suitable for human consumption. Denatured alcohol is used as a [solvent](#) and as fuel for spirit burners and camping stoves. Different additives like methanol are used to make it difficult to use [distillation](#) or other simple processes to reverse the denaturation.
- NCM 2207.20.19 - denatured ethylic alcohol with any ethanol content. Others. Denatured alcohol is defined as [ethanol](#) with additives which make it [poisonous](#) and/or unpalatable, thus, no suitable for human consumption. Denatured alcohol is used as a [solvent](#) and as fuel for spirit burners and camping stoves. Different additives like methanol are used to make it difficult to use [distillation](#) or other simple processes to reverse the denaturation.

There are no figures for ethanol exports for fuel and/or other uses. Post estimated ethanol "for fuel" based on the type of ethanol that is usually imported by the final destination, as reported by UNICA. Thus, the United States, the Caribbean countries and Sweden usually import ethanol for fuel; whereas Japan, Korea and several other importing countries, including the European Union import ethanol for industrial and other uses.

Domestic consumption figures were taken from information provided by Datagro, the Petroleum, Natural Gas and Biofuels National Agency (ANP) and UNICA.

The number of bio refineries was taken from MAPA and UNICA. Ethanol production capacity was based on production figures as reported by UNICA. Post took the highest ethanol production figure in a given 15-day period, as reported by the institution, and extrapolated to the entire Center-South crushing season. A similar procedure was performed for Northeast production based on MAPA reports.

Sugarcane crushed for ethanol production was calculated based on the actual production breakdown for sugar/ethanol as described in previous GAIN reports. Note that on average, one metric ton of sugarcane produces 80.5 liters of ethanol.

7.2. Biodiesel

Production numbers are based on figures reported by ANP and forecasts are based on projections for diesel consumption and the results from the public auctions. Biodiesel market continues to be regulated by the government through a public auction system which sets the volume of biodiesel that should be produced and delivered to fuel distributors in a particular period.

Consumption figures are based on mineral diesel consumption and the mandatory mixture of biodiesel (B2 through B7) in mineral diesel set by Brazilian legislation.

Trade figures were based on the Brazilian Secretariat of Foreign Trade (SECEX), as reported below:

- From 2006 through 2011 - NCM 3824.90.29 – Other industrial fatty acid derivatives, mixtures and preparations containing fatty alcohols or carboxylic acids or their derivatives.
- As of 2012 – NCM 3826.00.00 – biodiesel and their blends.

The number of bio refineries and production capacity are based on ANP reports. Feedstock use for biodiesel consumption is based on the following conversion rates:

- 0.875 metric ton of biodiesel = 1,000 liters of biodiesel
- 1 metric ton of biodiesel = 1.03 metric ton of soybean oil
- 1 metric ton of biodiesel = 1.00 metric ton of cottonseed oil
- Extraction rate for soybean oil = 0.1919
- Extraction rate for cottonseed oil = 0.1649
- 1 kg of animal fat = 1.064 liters of biodiesel

8. Exchange Rate

Exchange Rate (R\$/US\$1.00 - official rate, last day of period)							
Month	2009	2010	2011	2012	2013	2014	2015
January	2.32	1.87	1.67	1.74	1.99	2.43	2.66
February	2.38	1.81	1.66	1.71	1.98	2.33	2.88
March	2.25	1.78	1.62	1.82	2.01	2.26	3.21
April	2.18	1.77	1.57	1.89	2.00	2.24	2.98
May	1.97	1.81	1.57	2.02	2.13	2.24	3.18
June	1.95	1.80	1.57	2.02	2.22	2.20	3.10
July 1/	1.87	1.75	1.56	2.05	2.29	2.27	3.39
August	1.88	1.75	1.59	2.04	2.37	2.24	
September	1.78	1.69	1.85	2.03	2.23	2.45	
October	1.74	1.70	1.69	2.03	2.20	2.44	
November	1.75	1.71	1.81	2.10	2.32	2.56	
December	1.74	1.66	1.88	2.04	2.34	2.66	

Source: Brazilian Central Bank (BACEN).