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Paraguay

Bio-Fuels

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Report Highlights:

Paraguay continues to take firm steps towards a larger adoption of biofuel use. Ethanol consumption is expected to grow significantly after the government allowed the importation of flex fuel cars tax free. The new administration has expressed great interest in biodiesel to promote further rural family development. Both ethanol and biodiesel production are expected to continue to expand. Paraguay has the potential to become a biofuel exporter, but much investment will be needed.

Includes PSD Changes: No
Includes Trade Matrix: No
Annual Report
Buenos Aires [AR1]
[PA]

Situation and Outlook

Paraguay has the potential to become an important player in the world's biofuel sector. It has very good weather, rich soils, a broad agricultural base and culture, and the opportunity to add value to much of their current agricultural production. The new government in place has expressed great interest in biofuels, particularly on biodiesel production by small rural families. So far, investment has been in small plants, with capacities ranging between 2-36 million liters per year. There are 12 ethanol plants and 7 of biodiesel. Most of these companies are expanding capacity.

Paraguay imports all the oil it uses. Since 1999, gasoline has been mixed with ethanol at different blending levels. However, 75 percent of fuel consumption is diesel. On October 2005, Paraguay passed a law promoting biofuels. The main objectives behind this law are to diversify the supply of renewable energy, diminish the dependence on imported fossil fuel, substitute fossil fuel with renewable fuels, improve environmental quality, develop the farm sector (focused primarily on small producers), and to export ethanol and biodiesel.

Biofuel Policy

On October 2005, the Paraguayan Congress passed Law 2748 for Biofuels Promotion. The main points of this Law and its following decrees are:

- It declares production of biofuels to be of "national interest".
- It recognizes biodiesel, anhydrous ethanol and hydrated ethanol as fuels.
- Establishes minimum mix mandates for biodiesel at 1 percent in diesel for 2007, 3 percent in 2008, and 5 percent for 2009. The maximum blending mix at gas stations can reach 20 percent.
- Establishes mix mandates for ethanol of a minimum of 20 percent and a maximum of 24 percent in gasoline of 95 octane or under.
- Biofuel use is mandatory as long as there is sufficient local supply.
- It encourages the production of different feedstock for biofuel production, which has to be of local origin.
- Some tax benefits are provided, especially concerning investment.
- The Ministry of Industry will control investment and will determine production levels. The Ministry of Agriculture and Livestock will certify feedstock.

In May 2008, and as a result of proposed changes made by the official and private sectors, the government passed Decree 12240 reducing the VAT on biodiesel and ethanol to 2 percent, and eliminating import duties on flex fuel and E85 new and used cars.

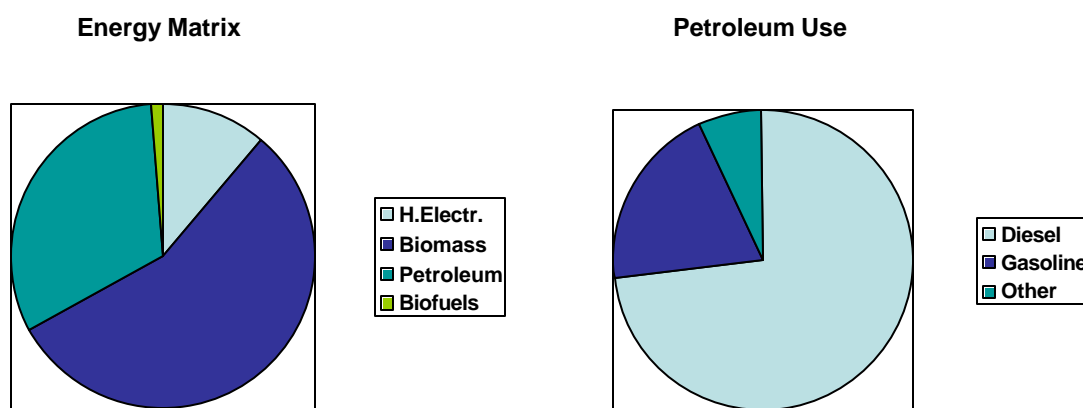
The Energy Market

Paraguay is an important producer of hydroelectricity, with significant exports to Argentina and Brazil. However, the largest source of energy consumed domestically is biomass, mostly wood and charcoal, which is widely used in homes and the industry. Following are petroleum products which are imported (Paraguay does not produce oil or gas), hydroelectricity, and finally biofuels with just 1 percent of the total. Of the country's total energy consumption, industry, transportation, and residential/commercial sectors demand roughly one third each.

In 2008, Paraguay consumed approximately 1.2 billion liters of diesel and 400 million liters of gasoline. Small volumes of kerosene and fuel oil were also consumed. Petropar, the national oil company, practically monopolized the diesel market by importing and selling it to distributors at subsidized prices. However, with the recent significant drop in world oil price, diesel price is no longer subsidized and private distributors are now importing and selling in the domestic market, as they do with gasoline.

There are currently 21 gas stations which sell hydrated ethanol and 6 which sell E85.

Paraguayan Energy Matrix and Petroleum Use



Ethanol

Resolution 425 of July 2008 established the current blending requirements for ethanol with gasoline. Gasoline of 95 octane and lower needs to be blended with a minimum of 20 percent and a maximum 24 percent of ethanol. In 2008, production is expected to reach 90 million liters, significantly higher than last years, which had some difficulties at the plants and with the sugar cane crop.

Paraguay has had a mixing requirement since Decree 2162 of March 1999 and its following resolutions. It first established that gasoline be mixed with 7 percent ethanol.

Ethanol in Paraguay is practically all done from sugar cane and molasses, with small volumes using grains as feedstock. Production for 2009 is forecast at 120 million liters. Official projections for 2011 set ethanol production at approximately 300 million liters, and 500 million liters by 2013.

There are eight sugar mills in Paraguay, of which two have distilleries that produce anhydrous ethanol. In addition, there are two distilleries, which produce hydrated ethanol. One of the sugar mills utilizes grains once the sugar cane harvest is over. Petropar, Paraguay's national oil company, is the largest ethanol producer, accounting for 26 percent in 2008.

Paraguay is the world's largest exporter of organic sugar. Crop 2008/09 will total approximately 100,000 hectares planted with sugar cane, and official studies indicate that the country has the potential to expand to 450,000 hectares. Sugar cane is produced in 14 of the 17 departamentos (states), but the largest concentration is in the central part of the eastern region. Planted area has been growing continuously since 2001. Sugarcane production has a strong social and economic importance as more than 25,000 farmers, most of which are small, make a living with it.

Based on 2008 data, almost 60 percent of the country's sugar cane was used to produce conventional and organic sugar, and the balance was used for ethanol. A few sugar mills produce ethanol from molasses. Private sources indicate that one hectare of sugar cane processed exclusively for ethanol yields about 4,000 liters.

There is one sugar mill in the eastern part of the country that has recently invested in an ethanol plant which can use grains, primarily sorghum and corn. Paraguay's historic corn production is about one million tons, used domestically for animal feed and human consumption. Another alternative feedstock for ethanol production is manioc or cassava, which is widely produced on about 300,000 hectares in Paraguay.

Official projections indicate that by 2013, Paraguay could export 300 million liters of ethanol, reducing oil imports, attracting investment in plants, distribution and thousands of hectares in new crops. This demonstrates the dynamism and importance of ethanol production in a country, which has very good agricultural aptitude, and practically no fossil fuel resources.

Biodiesel

Resolution 235 of April 2007 declared mandatory the blending of 1 percent biodiesel in diesel. This same resolution established that in 2008 the blending with biodiesel would increase to 3 percent, although it did not reach 1 percent because of the subsidy on diesel, and the high cost and scarce availability of raw material. However, production in 2009 is expected to increase, but still not to fulfill the 5 percent mandate, because: lower world oil prices and agricultural raw materials; the fact that local diesel oil did not come down much (so Petropar can make up for the losses while subsidizing during times of high oil prices); and the new government is encouraging its production. Therefore, production and consumption of biodiesel could total approximately 35 million liters in 2009.

By 2008, the government had approved seven biodiesel plants, of which most use animal fat as the main feedstock (they are also capable of using vegetable oil, while one company also utilized recycled cooking oil). Two leading local meat packers own biodiesel plants. No new plants are projected to be approved in 2009. The country's total production capacity is estimated at 45 million liters a year. There are two new large projects to produce approximately 100,000 hectares of *Jatropha* and 20,000 hectares of castor bean plant.

Paraguay's soybean crop in 2007-08 totaled approximately 6.8 million tons, of which just a quarter was processed domestically to attend the export market of meal and oil. Crushing capacity is expected to grow in the future, as a few companies have announced the intention of expanding production. Soybeans that are not processed are exported in beans, primarily to Argentina. Paraguay provides good opportunities for the local soybean/biodiesel complex, as it eventually could replace the importation of fossil diesel with renewable fuels produced from locally grown feedstock. If the entire demand of diesel would shift to locally produced biodiesel, Paraguay would save several million dollars in imports every year.

Apart from animal fats and soybean oil, Paraguay has good potential in producing biodiesel from Coco or Mbokaya (*Acrocomia totai*) which is widely grown in a vast area of the country. There are also studies to incorporate rapeseed as a winter rotation in the soybean area, which could expand productivity per hectare significantly. Sesame seed, sunflower, canola, castor oil, Tung and peanuts are some other alternatives, which could expand in the future depending on productivity and market conditions.

Petropar inaugurated in 2008 the first laboratory that can test biodiesel quality. This is an important step to continue in the process of using more biodiesel in fuel mixes. The National Institute of Technology and Measurements will have their own laboratory set in 2009.

Future Feedstock

There is limited official research done in feedstock for biofuel use, but there are plans to increase resources. Some private entities and companies, for example sugar mills, conduct their own research, focused primarily on genetics, yield efficiency, and crop management. Sugarcane remains the most promising feedstock for ethanol. The use of grains, such as sorghum and corn, is expected to be more limited.

Many people in Paraguay indicate that the commercial production of *Jatropha curcas* and *Acrocomia totai* are the future feedstock for biodiesel. Both of them have very good production of oil per hectare, they are longevous plants, are well adapted to Paraguay's environment, and their fruits are not for human consumption. Research is underway and a few private companies are very interested in producing at commercial scale. The Inter-American Bank of Development is funding two projects of Coco and one of *Jatropha*. The binational electricity companies Yacireta and Itaipu have programs of renewable energies and fund several projects for small rural producers in their area of influence.

Trade

Paraguay does not export ethanol or biodiesel. However, as the industry develops and current and future investments come on line, there will be exports of both biofuels. Some sources project that by 2015, Paraguay could export approximately 800 million liters of ethanol, and 250 million liters of biodiesel. The potential domestic consumption of ethanol is somewhat limited as the local vehicle market is primarily based on diesel engines. Low-cost sugarcane ethanol and limited local consumption of gasoline, opens great potential for large exports. Biodiesel in the near future will be directed more at the domestic market in order to replace large diesel imports. Once the local market of biodiesel is well supplied, exports will flow more regularly, as long as several of the current investment projects come to fruition.

Paraguay is a landlocked country surrounded by Argentina, Bolivia and Brazil. However, it has good connections to the Atlantic Ocean with a barge system through the Paraguay and Parana rivers, and with a trucking system to Paranagua port in Brazil (800 kilometers away from the eastern border of the country).

Paraguay will need to invest in infrastructure and logistics (terminals, storage, transportation, etc.) in order to be able to export large volumes of biofuels in the future.

Imports of biofuels into Paraguay are prohibited. However, they can be imported with a special official authorization. In mid-2008, the government authorized the importation of 6 million liters of ethanol from Brazil.

Regional and Bilateral Agreements

In mid 2007, the Presidents of Brazil and Paraguay signed a Memorandum of Understanding on Biofuels. The main areas of cooperation and work are the following: evaluation of different feedstock' potential; technological development of biofuel industrial processes; analysis of the system of infrastructure and logistics to have a production and commercial integration; and investment in the Paraguayan biofuels sector. Paraguay is currently working closely with the Brazilian Agricultural Research Corporation (Embrapa) in transferring technology, and identifying the most suitable feedstock. Meetings and work continued during 2008.

At the end of 2006, the Mercosur region established a Special Working Group on Biofuels. The first meeting of this group took place in Uruguay and the four countries of Mercosur and Venezuela participated. In late 2007, they defined an action plan. The main points were: evaluation of the production capacity of different feedstocks and different areas of production; identification of research organizations and entities to encourage joint work; analysis of current regulations; analysis of the infrastructure and distribution of fuels; and identification of tools to promote investment in the biofuels sector. In mid 2008, member countries signed a Memorandum of Understanding to develop a program of cooperation in biofuels and its technology.

*Statistical Information***Quantity of Feedstock Use in biofuel Production in MT**

		2005	2006	2007	2008	2009
Biodiesel						
Vegetable Oil						
	Soybean oil				4,000	15,000
	Rapeseed Oil					
	Palm oil					
	Coconut oil					
	Animal Fats			3,000	8,000	20,000
	Recycled Vegetable oil					
	Other					
Ethanol						
	Corn/Sorghum			14,000	21,000	30,000
	Wheat					
	Sugarcane	267,000	270,000	300,000	450,000	630,000
	Sugar beat					
	Rye					
	Molasses	94,000	96,000	120,000	180,000	230,000
	Wood					
	Cassava/tubers					

Biofuel Production/Consumption/Trade (million Liters)

Biodiesel	2005	2006	2007	2008	2009
Beginning stocks*			0	0	0
Production			3	12	35
Imports			0	0	0
Total supply			3	12	35
Exports			0	0	0
Consumption			3	12	35
Ending stocks*			0	0	0

Biofuel Production/Consumption/Trade (million Liters)

Ethanol	2005	2006	2007	2008	2009
Beginning stocks*	0	0	0	0	0
Production	45	46	60	90	120
Imports	0	0	0	6	0
Total supply	45	46	60	90	120
Exports	0	0	0	0	0
Consumption	45	46	60	96	120
Ending stocks*	0	0	0	0	0