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## Uruguay

### BIOFUELS ANNUAL

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**Report Highlights:**

Uruguay's biofuel production is very small, but new investments made by ANCAP, the national oil company, will begin to bear fruit in 2009. Approximately 6 million liters of fuel ethanol will be produced starting mid-year. The company will also begin producing biodiesel in two new modular plants which will be operational in the last part of the year. Biodiesel production will total approximately 5 million liters in 2009, of which only 20 percent will be produced by private companies. Uruguay's biofuel law mandates mixes for diesel (starting in 2009) and gasoline (in 2015). Mandates for biodiesel will be fulfilled starting in 2010, while ethanol mandates will be met much earlier. No exports of biofuels are expected in the short term.

**Post:**

Buenos Aires

**Commodities:**

## **Author Defined:**

### ***I. Situation and Outlook***

Uruguay's agricultural sector is expected to continue to grow because of attractive world commodity prices, the use of modern technology, more efficient use of land, and official policy. The production of biofuels provides an opportunity to add value to its agricultural production, to reduce the total dependence from imported petroleum, and promote a cleaner environment. Despite the recent investment made by ALUR (Alcoholes del Uruguay, a subsidiary of ANCAP, the national oil company), significantly larger investment will be needed to increase the volume of biofuels. There are two private investment projects to produce 100 million liters of bioethanol each. Both would use primarily sweet sorghum (and one also grain sorghum) as feedstock, since there have been encouraging results in their trials. Ethanol production would be available in 3-5 years time and it would mainly be exported.

The biofuel law 18,195 was passed in October 2007, and the related regulation issued in October 2008. It mandates for the domestic market that diesel be mixed with 2 percent of biodiesel during 2009-2011 and with 5 percent thereafter. Gasoline will have to be mixed with 5 percent of ethanol beginning 2015; prior to this date blending is voluntary (ANCAP is expected to mix an estimated 1.5 percent in 2009).

Until 2009, there was small-scale production of biodiesel used exclusively for the domestic market. However, ALUR/ANCAP is implementing a program to encourage oilseed production in the area close to Montevideo city and is in the process of installing two small modular biodiesel plants which will be on line in the last part of 2009. The building of a medium-size plant would follow, beginning operation in 2010-11. The 2 percent mix for biodiesel in 2009 most likely will not be fulfilled, but it probably will in 2010.

Until this year, Uruguay did not produce ethanol for fuel. However, in July-August ALUR/ANCAP is expected to begin production in a new distillery built in a sugar cane area in the northern part of the country. Therefore, ANCAP will be voluntarily advancing the 2015 mandate. Contacts estimate that in 2010, gasoline will be mixed with 6 percent ethanol.

### **Biofuel Policy**

Biofuel law 18,195 was passed in late 2007 to provide regulations for the development of this new industry that in the past was exclusively administered by ANCAP.

The objective of the law is to promote and regulate biofuel production, commercialization, and use. In October 2008 the government published the regulations for its implementation.

Following are the main points of the law:

- Regulates the production, commercialization and use of biofuels (ethanol, biodiesel and blends).
- ANCAP, the national oil company, will no longer have the monopoly of producing and exporting biofuels. Imports and domestic commercialization will continue to be exclusively in the hands of ANCAP.
- Sets the percentages of mixes in diesel and gasoline. In the case of biodiesel, it can be voluntarily mixed at a 2 percent ratio with diesel until the end of 2008, and then it will become compulsory. Starting in 2012, the percentage of biodiesel will increase to 5 percent. In the case of ethanol, its use in gasoline will be voluntary until 2014. After 2015, it will become mandatory to be mixed in a 5 percent ratio.
- It allows small-scale production (4,000 liters/day) of biodiesel for self-consumption.
- Biofuel exports will need previous authorization.
- The Government of Uruguay (GOU) provides tax exemptions to biofuel investment and can exempt some taxes on biofuels that are consumed.
- It establishes product standards and quality.

The previous biofuel law 17,567, of October 2002, was not operational because its regulations were never published. In 2005, the GOU created the National Biofuels Commission to advise on the framework for state policies related to biofuels production and use. It also established a National Bioethanol Program (Pronabio-E, administered by ANCAP) to coordinate the production of ethanol in different agricultural regions throughout the country.

### **The Energy Market**

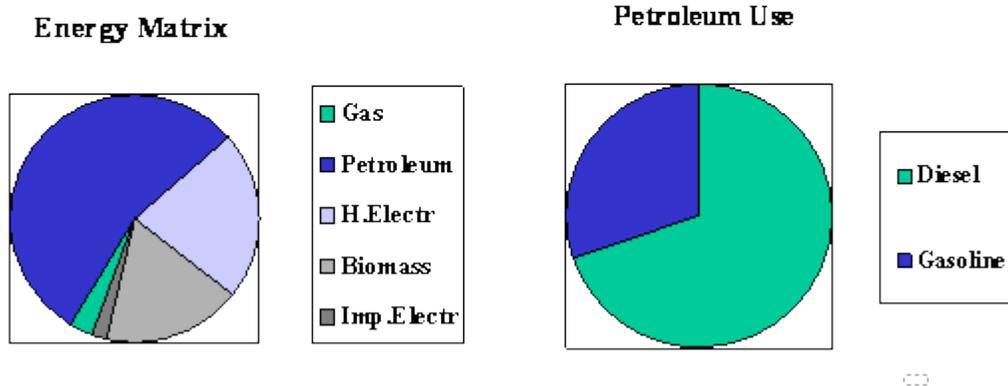
Uruguay's 2007 energy supply shows that petroleum accounted for 55 percent of the total, followed by locally-generated hydropower and by biomass (primarily wood). Uruguay imports all its petroleum needs, which exceeded US\$1 billion in 2007 and practically doubled in 2008. Diesel consumption for vehicles in 2008 was about 880 million liters, while gasoline was 380 million liters. If the 5 percent mandate were in place today, Uruguay would need roughly 20 million liters of ethanol and 45 million liters of biodiesel.

Of the country's 2007 total energy demand, transportation accounted for 33 percent, residential use accounted for 28 percent, the industrial sector represented 22 percent, the commercial/services sector 9 percent, and the agricultural/fishery sector 8 percent.

The main objective of biofuel production is to partially replace petroleum used by cars and the transportation sector. However, depending on costs and price differences between petroleum

and biofuels, Uruguay could utilize biodiesel to feed its electric power plants in the future. The use of biomass to generate electricity is becoming more important. The use of waste from the wood/forest, cellulose, rice, and sugar industries provides great opportunities to increase the production of energy from locally produced feedstocks.

## Uruguayan Energy Matrix and Petroleum Use



### Ethanol

ANCAP (which currently produces ethanol for industrial use and beverages) has in progress a Biofuels Program. In early 2006, it took over the Bella Union sugar mill in the northwestern part of the country. PDVSA, the Venezuelan oil company, owns 10 percent of the distillery. Investment in this project has been over US\$40 million. The new alcohol distillery will be inaugurated in July-August 2009. The program also includes the expansion of cane plantations to 10,000 hectares, of which over 75 percent have been planted already. Official sources indicate that the distillery's capacity will be 120,000 liters/day (with an estimated production of 6 million liters in 2009, representing approximately 1.5 percent of Uruguay's gasoline consumption). ANCAP is building blending and distribution infrastructure to market ethanol fuel at gas stations. Contacts indicate that it will be ready by the time supply of ethanol is available.

The ethanol plant which ANCAP currently has operational is in Paysandu, and produces about 1.5 million liters per year. There are projects to expand its production capacity, by which it would produce ethanol for fuel and industrial use. The main feedstock is sorghum and, to a lesser extent, molasses. Uruguay normally uses 5 million liters of ethanol per year for

beverage and industrial use, of which a large portion is imported primarily from Argentina. The plant in Bella Union will use molasses, sugar cane, and sorghum as feedstock.

ANCAP is so far the only player in the ethanol sector. There are a couple of foreign companies working at trial level with sweet sorghum to produce ethanol in southern and eastern Uruguay. One is a French company that plans to install a 100 million liter distillery in the southeast part of the country which will be fed with sweet and grain sorghum. Production would begin in March 2012 and most of it will be exported. The plant will produce fuel ethanol, animal feed, and fertilizers and will cogenerate electricity. The other one is a US investment, with a similar production capacity, using sweet sorghum and focusing on second-generation cellulosic feedstock. Ethanol production could begin in 3-5 years, and it would also focus on the export market.

## **Biodiesel**

Uruguay's biodiesel production is forecast at 5 million liters for 2009. The majority of the production will come from two new modular plants which ANCAP will put into production in September of this year. Contacts indicate that many of the private biodiesel plants will not operate this year as the business of turning vegetable oil or tallow into biodiesel is currently unprofitable and most believe it will remain that way the rest of the year. Apart from the two ALUR/ANCAP plants, there are six medium size plants (production capacity range between 10-40 tons a day each), of which two use tallow or vegetable oil, three vegetable oil and one rice oil. There are some 5-10 small plants which process for their own consumption. Of the country's total biodiesel output in 2009, practically all is expected to be produced out of vegetable oil, a big change from previous years in which tallow was the predominant feedstock. Contacts indicate that ALUR's biodiesel plants will utilize primarily sunflower oil, while biodiesel produced by private firms will be primarily from soybean oil. Most contacts believe that biodiesel in Uruguay will be focused mainly on the local market and to a lesser extent to supply niche export markets in the future. In the past couple of years, the interest of private companies in biodiesel plants has fallen. Some plants that were already producing closed and many projects that were waiting for the biofuel law to be enacted will not likely be completed. The main reason is the high cost of feedstock, which causes producers in many cases to sell the oil or tallow directly and/or export it.

The Uruguayan government, through ALUR/ANCAP, is determined to begin to mix biodiesel in 2009, although it will probably not fulfill the mandated volume. To this extent, it has

established a program to encourage small farmers in the southern part of the country (where the largest diesel consumption takes place) to produce sunflower and soybeans, and eventually canola. They work through cooperatives helping producers finance inputs and provide them with technical assistance. The oilseeds will be crushed in a private vegetable oil plant in Montevideo and then processed into biodiesel in two small modular plants (with a capacity of 8 million liters/year each) which will be installed next to the crushing facility. Biodiesel production is projected to commence in September of 2009. Contacts estimate that these plants will produce approximately 4 million liters before the end of the year. In the meantime, ANCAP has a project to incorporate a 50 million liter/year biodiesel plant in the Montevideo area, which could come on-line in 2011. The protein meal produced from the crushing will partially replace imports and be used for animal feed.

Until now, most biodiesel was used for rural equipment, irrigation systems, and for bulk transportation or buses. Small producers use it for self-consumption. Blending percentages vary from small levels to 100 percent biodiesel. With the incorporation of the two modular plants, cars and trucks will use biodiesel. Gas stations do not need to specify when selling biodiesel in low mixes.

Uruguay produces sunflower and soybeans, but little is processed locally. There is only one commercial-size oil crusher in the country, which signed the agreement with ALUR/ANCAP to provide the vegetable oil as feedstock for biodiesel. Until last year this company had excess capacity, but with the new agreement, it will fill most of it. The country's small crushing capacity limits the growth of a larger biodiesel industry, but at the same time, it provides good opportunities for investment. Oilseeds production is projected to continue to grow because of the adoption of new technology, new land into production, and attractive world prices. Many believe that in the future there will be a large development of small-scale biodiesel production at the farm level where output will be consumed on site. Producers can lower fuel costs (as they do not have to pay certain taxes and distribution costs) and can integrate beef and milk production by feeding high-protein meal.

Uruguay is one of the world's largest beef exporters. Its industry is well developed. It produces abundant tallow, of which part is consumed locally, and the rest is exported. Until last year, local biodiesel producers used primarily tallow (which is less expensive than vegetable oil), processed in 2-3 plants. Tallow will probably not be used in 2009 for biodiesel production, because it is more profitable to export it as is. The country's total tallow production could barely supply enough biodiesel to mix diesel at a 4-5 percent ratio.

Sources indicate that Uruguay's biofuel sector has some disadvantages compared to its neighbor Argentina. Argentina's huge vegetable oil complex and the export logistics of that country make it difficult for Uruguay to compete as it has higher processing costs and small volumes to ship. In addition, Argentina currently has a differential tax in favor of biodiesel

exports. However, these same sources believe that Uruguay provides other significant advantages (e.g., strong institutional framework).

### **Future Feedstock**

There are several local institutions involved in research and development. These include the National University, through its science and agricultural schools, the National Agricultural Research Institute, the national oil company, and private universities.

Feedstocks used in 2009 for ethanol production will most likely be molasses, sugar cane, and some sorghum. For biodiesel production, it will mostly be sunflower and soybean oil. However, many contacts are confident that there is a promising future in the use of rice husks and straw, sweet sorghum, wood residues, bagasse, switchgrass, elephant grass, and giant miscanthus for ethanol. For biodiesel, there is interest in expanding the production of sunflower and canola, as they are significantly more efficient (oil/per hectare) than soybeans. The biofuel law states that biodiesel has to be produced from feedstock produced domestically, unless there are strong reasons to source from other countries.

### **Trade**

Most contacts indicate that Uruguay, in the medium term, could export small volumes of biodiesel, focusing on niche markets in the region. The local industry does not have the storage infrastructure to load oil tankers for export (to the European Union for example). Therefore, exports will most likely be regional and transported by truck.

ALUR/ANCAP's objective of ethanol production is primarily for the domestic market. However, as output increases with new investments come on-line, the US and the EU could become markets. Exports to Brazil could also be a possibility, as its ethanol output is located in the north. Sourcing product from northern Uruguay to supply the southern part of Brazil could provide strong cost advantages in transportation. Some exports could also go to Venezuela, as it is a partner in the Bella Union project.

II. Statistical Information

<b>Quantity of Feedstock Use in biofuel Production in MT</b>						
		2005	2006	2007	2008	2009
<b>Biodiesel</b>						
Veg. Oil						
	Soybean oil	265	620	880	1900	1600
	Rapeseed oil					
	Palm oil					
	Coconut oil					
	Animal Fats	1200	1800	2500	600	
	Rec. Veg. oil					
	Other				200	2800
<b>Ethanol</b>						
	Corn					
	Wheat					
	Sugarcane					36000
	Sugar beat					
	Rye					
	Molasses					11300
	Wood					
	Cassava/tubers					

<b>Biofuel production/Consumption/trade (million liters)</b>					
	2005	2006	2007	2008	2009
<b>Biodiesel</b>					
Beginning stocks*					
Production	1.5	2.5	3.5	3.0	5.0
Imports	0	0	0	0	0
Total supply	1.5	2.5	3.5	3.0	5.0
Exports	0	0	0	0	0
Consumption	1.5	2.5	3.5	3.0	5.0
Ending stocks*					

<b>Biofuel production/Consumption/trade (million liters)</b>					
	2005	2006	2007	2008	2009
<b>Ethanol</b>					
Beginning stocks*					
Production				0	6.0
Imports				0	0
Total supply				0	6.0
Exports				0	0

Consumption				0	6.0
Ending stocks*					