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Global Agricultural Information Network

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Peru

Biofuels Annual

Peru resumes biodiesel production

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Report Highlights:

Ethanol production in Peru is expected to reach 161 million liters in 2018 falling two percent compared to the previous year due to increased production of sugar. Ethanol imports in 2018 are forecast at 200 million liters. Biodiesel production is forecast at 62 million liters in 2018 while imports are forecast at 274 million liters. Peru created E7.8 and B5 mandates for ethanol and biodiesel which were reached in 2013 and 2012, respectively. Blending has remained at that level since with all further growth tied to increased fuel pool size.

Executive Summary:

Peru's Consumer Defense and Intellectual Protection Institute (INDECOPI) initiated a countervailing duty investigation against U.S. ethanol exports to Peru on April 25, 2017. INDECOPI held the final hearing of interested parties on September 27, 2018. At the time of writing, a determination has been released, but due to the option to appeal, the case is ongoing and there is no final outcome at this time. A final determination is expected by the end of 2018.

Peru does not provide tax incentives or set prices to directly support profitable biofuel margins that would give biofuels an advantage over fossil fuels. Instead, Peru relies on the mandatory blend rates of 7.8 percent for ethanol and five percent for biodiesel.

Fuel ethanol production in Peru is forecast at 161 million liters for 2018, a reduction of two percent compared to the previous year. This reduction is explained by an increase of sugar production. Consumption for 2018 is forecast at 189 million liters, increasing two percent from 2017. Imports in 2018 are forecast at 200 million liters, up 12 percent from the previous year.

The expansion of fuel ethanol consumption slowed dramatically after the target blend rate was achieved in 2013 with further gains dependent solely on a growing gasoline market. Peru ships to Europe and then uses imports to back fill even though it has sufficient production capacity to support consumption and exports. The limiting factor is insufficient sugar cane feedstock to supply both the sugar and ethanol markets.

The expansion of biodiesel consumption also slowed dramatically after the target blend rate was achieved in 2012 with further gains dependent solely on a growing diesel market. After halting biodiesel production between 2014 and 2016, Peru produced 37 million liters of biodiesel in 2017. Peru is forecast to produce 62 million liters of biodiesel in 2018. Biodiesel imports in 2018 are forecast at 274 million liters, a reduction of six percent compared to the previous year due to the projected increase in domestic production. Peru is the only country with a biodiesel mandate that relies heavily on imports to meet that mandate. With sufficient production capacity to fully meet consumption, the limiting factor is a support scheme to bridge the price difference between domestic palm oil biodiesel and fossil diesel. This gap widened considerably to the disadvantage of biodiesel following the oil price collapse of 2014, but has narrowed over the past two years as oil prices have risen.

Increases in the blend rate for both ethanol and biodiesel are unlikely at this time. As a result, increased biofuel consumption will depend solely on increased fuel use. There is currently no policy in place to support advanced biofuels research.

II. Policy and Programs

Peru does not provide tax incentives or set prices to directly support profitable biofuel margins, which would give biofuels an advantage over fossil fuels. Peru relies solely on mandatory blend rates. Per the U.S.-Peru Trade Promotion Agreement, U.S. ethanol is imported into Peru duty free as of 2018. Peru imports U.S. biodiesel duty-free. At COP21 of the United Nation's Paris Climate Change Conference, Peru

committed to a 30-percent, economy-wide reduction in emissions by 2030. While it plans to obtain this primarily through its forestry sector, a national law promoting the investment, development, and use of biofuels is included in this strategy (Supreme Decree 012-2009). The following four regulations provide the legal framework that govern Peru's biofuel sector.

Peru's Consumer Defense and Intellectual Protection Institute (INDECOPI) published Resolution 107-2017/CDB-INDECOPI dated April 25, 2017. The Resolution determines that there is enough evidence to begin a countervailing duty (CVD) investigation on U.S. ethanol exports to Peru. At the time of writing, a determination has been released, but due to the option to appeal, the case is ongoing and there is no final outcome at this time.

Supreme Decree 013-2005 EM - Regulation for Biofuels Market Promotion: This 2005 decree sets the biofuel content in fuels distributed and sold within Peru. Gasoline must contain at least 7.8 percent ethanol. Diesel must have a biodiesel content of no less than five percent. This minimum blend level mandate applies to all diesel end-use markets, both on and off-road and heat and power.

Law 28,054 – Biofuels Market Promotion: This law (April 20, 2007) establishes the legal framework for promoting the use of biofuels in Peru. The legislation seeks to increase employment, diversify the country's fuel sources, strengthen agricultural development, reduce environmental contamination and degradation, and provide an alternative source of income to illicit coca cultivation and drug production. This law promotes investment in biofuel production and its commercialization.

The law established the PROBIOCOM program within Peru's investment agency (i.e., PROINVERSION) in order to attract investment in the local biofuel sector. While the framework of this law remains in force, no new investments were made beyond the initial years.

The Biofuels Market Promotion legislation establishes the technical committee responsible for determining blend rates and schedules, as well as recommending biofuel production and commercialization regulations. The committee is also responsible for enhancing public awareness of the benefits of biofuels. The Ministries of Energy and Mines, Economy and Finance, Agriculture, PROINVERSION, DEVIDA (alternative development agency) and the private sector compose the technical committee's membership.

Supreme Decree 021-2007 EM – Regulation for the Commercialization of Biofuels: This law (April 2007) establishes the legal requirements for trading and distributing biofuels in Peru, while also establishing quality standards and procedures for registering biofuel blends with the Ministry of Energy and Mines. The decree sets the schedule for biofuel blending minimums in fossil fuels. Since 2010, when the blend wall was finally phased in nation-wide, all gasoline sold in Peru is required to contain at least 7.8 percent ethanol. Since 2011 diesel fuel sold in Peru must contain a minimum of five percent biodiesel.

The following regulations delineate responsibilities among the different agencies:

- *Ministry of Agriculture and Irrigation:* Responsible for promoting the development of the agricultural areas necessary for biofuel production.
- *Ministry of Energy and Mines:* This ministry authorizes the commercialization of biofuels and blends thereof with gasoline and diesel fuels.
- *Ministry of Production:* Authorizes the operation of biofuel production facilities.

- *OSINERGMIN*: Supervises and controls operations throughout the production chain.
- *PROINVERSION*: Promotes investment in the biofuels sector.

Supreme Decree 012-2009 MINAM, National Environmental Policy: The Mining and Energy chapter of this Supreme Decree establishes as a priority the promotion of investment, development, and use of biofuels as an opportunity of substitute petroleum and gas to reduce carbon emissions.

Peru does not have environmental sustainability (like greenhouse gas emission limits) or environmental certification requirements for biofuels.

III. Gasoline and Diesel Markets

Fuel Use History (Million Liters)										
Calendar Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018 ^f
Gasoline Total	1,505	1,658	1,843	1,931	2,047	2,147	2,223	2,303	2,373	2,420
Diesel Total	4,487	4,842	5,464	5,687	5,943	5,809	6,303	6,631	6,685	6,720
Jet Fuel Total	701	781	850	883	964	1,063	1,120	1,220	1,228	1,235
Total Fuel Markets	6,693	7,281	8,157	8,501	8,954	9,019	9,646	10,154	10,286	10,375

f: forecast

Source: Ministry of Energy and Mines and private sector

The growing pace of demand for E7.8 gasoline has slowed in recent years as taxis and buses increasingly turn to liquefied natural gas (LNG) and liquefied petroleum gas (LPG). Demand for these two alternative fuels in 2017 accounted for about 49 percent of total fuel use. This trend directly affects gasoline and thus ethanol consumption. Nonetheless, FAS Lima forecasts that despite growing demand for LNG and LPG as transportation fuels, increased automotive ownership and the continuation of the E7.8 requirement will lead to increased demand for gasoline and thus ethanol.

The city of Lima and its immediate surroundings account for roughly 65 percent of the country's ethanol and gasoline demand. REPSOL (Spain) and Petro Peru (state-owned) are the Peruvian market's main gasoline suppliers. These suppliers oppose any increase in the current ethanol blend rate of 7.8 percent. Peru is a relatively efficient producer of gasoline and raising the blend rate leads to revenue loss for gasoline producers who supply the market.

IV. Fuel Ethanol

Peru began producing ethanol in 2008. It produced fuel ethanol in sufficient volumes to supply domestic consumption through 2014 when one of the producing plants closed temporarily due to financial difficulties. From the beginning, Peru has also exported 'high-value,' sugar cane-based ethanol to the European Union, which raises the demand for imports to meet its domestic demand. Peru met the E7.8 requirement in 2013 after a three-year delay.

Ethanol Used as Fuel (Million Liters)										
Calendar Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018 ^f
Beginning Stocks										
Fuel Begin Stocks	0	0	0	1	12	21	5	2	75	142
Production										
Fuel Production	68	70	195	142	204	190	152	206	165	161
Imports										
Fuel Imports	14	12	38	115	114	63	112	160	178	200
Exports										
Fuel Exports	58	64	211	122	149	102	94	113	91	75
Consumption										
Fuel Consumption	24	18	21	124	160	167	173	180	185	189
Ending Stocks										
Fuel Ending Stocks	0	0	0	12	21	5	2	75	142	31
Total Balance Check	0	0	0	0	0	0	0	0	0	0
Fuel Balance Check	0	0	0	0	0	0	0	0	0	0
Refineries Producing Fuel Ethanol (Million Liters)										
Number of Refineries	1	1	2	2	2	2	2	2	2	2
Nameplate Capacity	126	126	230	350	350	350	350	350	350	350
Capacity Use (%)	54.0%	55.6%	84.8%	40.6%	58.3%	54.3%	43.4%	58.9%	47.1%	46.0%
Co-product Production (1,000 MT)										
Bagasse	281	289	805	586	633	784	627	850	680	664
Feedstock Use for Fuel Ethanol (1,000 MT)										
Sugar Cane	850	875	2,438	1,775	2,550	2,375	1,900	2,575	2,063	2,013
Market Penetration (Million Liters)										
Fuel Ethanol Use	24	18	21	123	160	167	173	180	185	189
Gasoline Use	1,505	1,658	1,843	1,931	2,047	2,147	2,223	2,303	2,373	2,420
Blend Rate (%)	1.6%	1.1%	1.1%	6.4%	7.8%	7.8%	7.8%	7.8%	7.8%	7.8%

f: forecast

Source: Ministry of Agriculture, Private Sector, Ministry of Energy and Mines, FAS Lima analysis

Note: Forecasts are based on the assumption that Peru will continue to reach the E7.8 mandate. Some small volumes of ethanol traded may be for beverage use and other industrial chemicals not used as fuel.

Production:

Peruvian ethanol production in 2018 is forecast at 161 million liters, a reduction of two percent from the previous year. This reduction is due to increased sugar production. Nameplate capacity is forecast to remain the same in the near future at 350 million liters with only a near 50% capacity use rate..

Peru's two ethanol production facilities are located in the state of Piura in northern Peru. Coazucar's Aurora facility is configured to produce sugar or ethanol depending on the economics at a given moment. This company is owned by Grupo Gloria (Peru's largest dairy processor). The other production facility is Caña Brava, a \$210 million facility owned by the Romero Group. It maintains approximately 8,000 hectares of planted sugarcane fields with a production capacity of 127 million liters per year.

Peru uses sugarcane as the feedstock for bioethanol production. This sugarcane is cultivated on formerly idle, non-irrigated desert lands. Ethanol production is centered in Piura where companies take advantage of the favorable weather conditions (i.e., ample sunlight due to proximity to the equator). Despite an average

annual rainfall of only 25 millimeters, sugarcane is cultivated year-round using modern irrigation technology. The sugarcane fields are drip irrigated with water drawn from the Chira River. The river is also fed by the Poechos Reservoir, which has a one billion cubic meter capacity and a discharge rate of four cubic meters per second. The reservoir is 30 kilometers from the Peru-Ecuador border.

A number of sugarcane growers are evaluating the economic feasibility of diverting part of their crop to ethanol production. However, sources indicate that there are no immediate plans to initiate commercial operations.

Sugarcane yields can be as high as 200 metric tons (MT) per hectare, although average yields normally are around 140 MT per hectare, with 13 to 18 months between cuts. Brazil’s shorter 180 day growing season produces lower yields of 70 MT per hectare. Sugarcane cultivation in Piura absorbs about 17,000 cubic meters of water per hectare per year.

Consumption:

Ethanol consumption for 2018 is forecast at 189 million liters, increasing two percent from 2017. Peru met its ethanol mandate three years late in 2013, and has continued to reach it since that year. Unless there is an unforeseen increase in the ethanol blend mandate, ethanol consumption will only increase as gasoline consumption increases. There is no current discussion within the government to increase the ethanol mandate.

Trade:

FAS Lima forecasts Peru’s 2018 fuel ethanol exports at about 75 million liters, 18 percent lower than 2017. Unattractive EU market prices have discouraged production reducing the available volume for export. Fuel ethanol imports in 2018 are forecast at 200 million liters, up 12 percent from the previous year.

Ethanol imports of both undenatured and denatured ethanol (HS codes 2207.10 and 2207.20) are assessed a six percent import duty plus an 18 percent value-added tax. Under the U.S.-Peru Trade Promotion Agreement, a ten-year tariff phase out schedule was applied to U.S. denatured ethanol. As of 2018, denatured U.S. ethanol is imported into Peru free of duties. Undenatured U.S. ethanol was granted duty free entrance when the Agreement entered into force in 2009. Peru exports undenatured ethyl alcohol (2207.10). In 2017, it exported 91 million liters, of which 50 million liters were fuel exports destined to the European Union. The largest markets are the Netherlands, Colombia, and Ecuador.

Peruvian Undenatured Ethyl Alcohol Exports (220710)			
(Million Liters)			
	2015	2016	2017
World	94	113	91
Netherlands	51	84	50
Colombia	24	14	16
Ecuador	14	7	13

Source: Peruvian Customs Authority

Peruvian Undenatured Ethyl Alcohol Imports (220710) (Million Liters)			
	2015	2016	2017
World	32	47	66
U.S.	19	35	51
Bolivia	12	10	13
Ecuador	1	2	2

Source: Peruvian Customs Authority

Peruvian Denatured Ethyl Alcohol Imports (220720) (Million Liters)			
	2015	2016	2017
World	80	113	112
U.S.	80	113	112

Source: Peruvian Customs Authority

The average export price for Peruvian ethanol in 2017 was USD\$ 0.55 per liter while ethanol was imported into Peru at an average price of USD\$0.59 cents per liter. Peruvian ethanol is mostly exported to the Netherlands. Peruvian ethanol exported to the European Union (EU) benefits from price premiums for green harvesting (i.e., harvesting without cane field burning) and biological pest control among other more environmentally friendly measures.

Peru's ethanol does not meet biofuel land use requirements under the US Energy Act of 2007 (EISA 2007) and thus cannot count towards fulfilling obligations (mandates) under the Renewable Fuel Standard (RFS), making it ineligible for Renewable Identification Numbers (RINs). RINs add value to biofuels sold in the United States. Peruvian ethanol's lack of RINs eligibility limits its market opportunity in the United States. Biofuels coming from overseas can fulfill RFS obligations and generate RINs if the biofuel plant was "grandfathered in" by supplying the U.S. market prior to 2007 or by certifying that the biofuel: 1) comes from feedstock grown on lands that were cultivated prior to 2007, and 2) is covered by a feedstock tracking and certification scheme that insures ineligible feedstock are excluded, and 3) meets a minimum environmental sustainability standard of 20 percent greenhouse gas savings over fossil fuel or 50 percent to qualify for an advanced non-cellulosic fuel. No plants in Peru could be grandfathered, and Peru does not meet the land use condition because desert lands used to produce ethanol were converted after 2007. As a result, ethanol produced using feedstock from those lands, cannot meet RFS obligations as defined under EISA 2007.

V. Biodiesel/ Renewable Diesel

Production:

Peru is forecast to produce 62 million liters of biodiesel in 2018. After halting biodiesel production between 2014 and 2016, Peru produced 37 million liters of biodiesel in 2017. This production recovery is due to a decline in imports in 2017. This decline in imports is forecast to continue into 2018 due to antidumping duties assessed on Argentinean biodiesel. However, industry sources indicate that despite the anti-dumping duties on Argentinian biodiesel and the existence of a biofuel promotion law (Law 28054) that prioritizes domestic biodiesel production and procurement, local fuel distributors will continue to

import more affordable biodiesel from other sources, including Indonesia.

Peru produces biodiesel using crude palm oil (CPO) as a feedstock. PetroPeru, the entity that regulates biodiesel production and imports, notes that palm oil diesel quickly solidifies as temperature drops at higher altitudes, clogging fuel filters and damaging truck engines.

Biodiesel (Million Liters)										
Calendar Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018 ^f
Beginning Stocks	2	3	2	2	7	12	10	10	10	3
Production	10	32	32	18	10	0	0	0	37	62
Imports	166	162	178	271	304	315	315	332	290	274
Exports	0	0	0	0	0	0	0	0	0	0
Consumption	175	195	210	284	309	317	315	332	334	336
Ending Stocks	3	2	2	7	12	10	10	10	3	3
BalanceCheck	0	0	0	0	0	0	0	0	0	0
Production Capacity (Million Liters)										
Number of Biorefineries	1	2	2	2	2	2	2	2	2	2
Nameplate Capacity	200	350	350	350	350	350	350	350	350	350
Capacity Use (%)	5.0%	9.1%	9.1%	5.1%	2.9%	0.0%	0.0%	0.0%	10.6%	17.7%
Feedstock Use for Fuel (Million Liters)										
Crude Palm Oil	12	34	34	19	11	0	0	0	40	67
Market Penetration (Million Liters)										
Biodiesel, on-road use	175	195	210	284	309	317	315	332	334	336
Blend Rate (%)	3.9%	4.0%	3.8%	5.0%	5.2%	5.5%	5.0%	5.0%	5.0%	5.0%
Diesel, total use	4,487	4,842	5,464	5,687	5,943	5,809	6,303	6,631	6,685	6,720

f: forecast

Source: Peruvian Customs, PetroPeru, Private Sector, Global Trade Atlas, FAS Lima Analysis

Peruvian Biodiesel Imports – 3826.00 (Million Liters)				
	2014	2015	2016	2017
World	262	290	291	282
Argentina	262	242	171	47
Netherlands	0	0	86	75
Indonesia	0	35	17	140

Note: Assume all product is B100.

Source: Peruvian Customs Authority as collected and reported by Global Trade Atlas

Peruvian Petroleum Oils and Preparations Containing up to 30 percent Biodiesel Imports – 2710.20 (adjusted to B100-equivalent, Million Liters)				
	2014	2015	2016	2017
World	5.6	33.0	10.9	11.9
U.S.	5.0	5.3	8.0	9.9

Note: The assumed average blend rate for imports is B10.

Source: Peruvian Customs Authority as collected and reported by Global Trade Atlas

Consumption:

FAS Lima forecasts biodiesel consumption at 336 million liters in 2018, a slight increase over the 334 million liters consumed in 2017. Consumption has remained heavily dependent on imports, particularly from 2014 to 2016 when all demand was met with imported biodiesel. Peru met the B5 requirement in 2012, just one year late, after the blending requirement went into effect. The blend rate has remained quite steady at B5 since 2012, and FAS Lima expects this blend rate to remain near that same level for the near future.

Trade:

Biodiesel imports in 2018 are forecast at 274 million liters, a reduction of six percent compared to the previous year due to the projected increase in domestic production. Biodiesel imports, both 3826.00 (covering blends above B30 to B100) and 2710.20 (petroleum oils containing 1-30% biodiesel), enter Peru duty free. Post believes that product imported under 2710.20, all of which comes from the United States, contains 10% biodiesel. If this is the case, and soy oil biodiesel is used (the most common type of U.S. biodiesel), it would perform better in colder temperatures than domestic CPO-based biodiesel blended at B10 or lower.

Peru imposed temporary anti-dumping and countervailing duties on U.S. biodiesel in December 2009 in response to exports that began in December 2008. From that date until the imposition of temporary duties, U.S. shipments totaled 85 million liters, which was equal to half of Peru's consumption in 2009. U.S. exports stopped immediately following the imposition of these temporary duties, with the exception of two final shipments in March and June of 2010. On August 23, 2010, Peru's INDECOPI published Resolution 151-2010-CFD-INDECOPI imposing permanent countervailing duties and anti-dumping duties on all U.S. exports of B51-100. These duties are \$178 per metric ton and \$212 per metric ton, respectively. The duties were renewed in 2016 after the expiration of the initial countervailing and anti-dumping duties. U.S. biodiesel shipments to Peru resumed in 2013, under Chapter 2710.20 to which the higher duties are not applied.

INDECOPI published resolution 011-2016/CDB-INDECOPI on January 25, 2016, establishing countervailing duties on all Argentinean biodiesel. This process was initiated after allegations from Palmas del Espino (Grupo Romero), who halted production at its Tocache production plant, claiming unfair competition from biodiesel from Argentina. Due to these countervailing duties, imports from Argentina fell in 2016 and 2017, and FAS Lima forecasts that B100 Chapter 38 imports from Argentina will remain limited in 2018. Meanwhile, B100 Chapter 38 imports from Indonesia, rose in 2017 and are expected to remain generally higher in 2018 but have not fully offset the drop in imports from Argentina. Total imports from all countries are thus lower in both 2017 and 2018. The outcome should continue to create an opportunity for Peru biodiesel plants to continue production in 2018 and onwards. The countervailing duties levied against biodiesel from Argentina are as follows:

Countervailing Duties Against Argentinean Biodiesel

Producer	\$/MT
LDC Argentina	15.4
Molinos Rio La Plata, Renova Vicentin	17.1
Cargill	24.1
Aceitera General Deheza Bunge Argentina (T6 Industrial)	31.3
Other producers/exporters	208.2

Source: INDECOPI

VI. Advanced Biofuels

There is currently no ongoing research on advanced biofuels in Peru. There is also no policy in place to support advanced biofuels research.

VII. Notes on Statistical Data

Ethanol production in Peru utilizes the diffusion method, adopted from Brazilian technology. This method consists of shredding harvested sugarcane stalks very thinly, then moving the shreds through thirteen consecutive warmer water (70-80°C) showers. The water from the final shower is allowed to ferment with alcohol producing yeast. Once the fermentation process is completed, the ensuing “liquor” is distilled. Industry sources clarify that this procedure is more efficient than traditional milling. The continuous flow also keeps plant idle time at a minimum. In order for a 350,000 liter per day ethanol plant to operate efficiently, 20 hectares of sugarcane must be processed daily. With an average sugar content of 17 percent, one metric ton of sugarcane produces roughly 170 kilograms of sugar or an amount equivalent to 80 liters of ethanol.

One metric ton of sugarcane also produces some 330 kilograms of bagasse (i.e., fibrous material that remains after sugarcane stalks are crushed to extract their juice). The bagasse, or sugarcane fiber, is used to produce 660 kilograms of steam. Steam-turned turbines generate the processing plant’s electricity needs. Ethanol operations utilize about eight megawatts per month. The excess energy produced (normally two to four megawatts) is sold to the national power grid. The following provides additional information on tables:

Table: Ethanol Used as Fuel (Million Liters)

Conversion: 1MT of sugar cane = 80 liters of ethanol

1MT of sugar cane = 330 kilograms of bagasse

Ethanol Trade: In this report, all exports of HS 2207.10 and 2207.20 to Europe is for use as fuel, while exports to other countries are for beverage or other industrial use. All imports of HS 2207.10 and 2207.20 from the U.S. are fuel grade ethanol, while imports from other countries are for use as beverage or other industrial uses.

Domestic sea freight charges: Private Sector Sources.