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Indonesia

Biofuels Annual

Indonesia Biofuels Annual 2016

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Report Highlights:
Indonesian palm oil-based biodiesel production is booming due to growing Indonesian demand. The rise of Indonesia's biodiesel consumption is directly attributable to the country's biodiesel subsidy, which under a low oil price environment since 2015 is now financed through a levy on palm oil and palm oil product exports. Post expects domestic biodiesel production to remain robust, although Indonesia's biodiesel subsidy will be challenged by low palm oil production in 2015/16 and lower-than-expected fossil fuel prices. Post thus expects biodiesel production to reach 2.45 billion liters in 2016, a rebound from 2015, but still below record levels experienced in 2014.

Post:
Jakarta

I. Executive Summary

Indonesia's biofuel sector is based on palm oil-derived biodiesel used for on-road transportation. Biodiesel production is booming due to growing Indonesian demand, which more than offsets the drop in export demand resulting from duties implemented in 2013 and the 2014 collapse of oil prices. Rapid growth in Indonesia's biodiesel blending and consumption is directly attributable to the country's biodiesel subsidy, which is financed through a levy on palm oil and palm oil product exports.

The new palm oil levy was implemented in summer 2015, collecting funds which are primarily used to subsidize the difference between biodiesel and fossil fuels. Although blending sector contacts express confidence that the levy will be able to subsidize production throughout the year, some contacts have recently started to express concerns that subsidized production may decline in the latter parts of 2016. They cite lower-than-expected fossil fuel prices as well as rising crude palm oil (CPO) prices as the main reason for this concern.

Indonesia does not use biodiesel for electricity generation or other off-road transportation uses in any significant quantity. Fuel ethanol refining does not occur in any significant quantity.

II. Gasoline and Diesel

Indonesian fuel consumption is shifting. Gasoline and jet fuel consumption has continued to grow while diesel fuel consumption plateaued and then declining slightly in past two years (see Table 1). Energy experts state that decreasing diesel fuel consumption is directly related to Indonesia's slowing economic growth. This is further confirmed by Indonesia's state-owned fuel company Pertamina, which noted that Indonesia's industrial sector has lowered its demand for diesel due to poor economic performance. Indonesia's transportation sector consumed around 80 percent of the country's total diesel fuel consumption in 2015.

Table 1. Indonesia, Fuel Use History

Fuel Use History (Billion Liters)											
Calendar Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Gasoline Total	17	17	18	20	22	24	27	29	31	31	33
Diesel Total	28	26	26	28	29	32	34	34	34	33	32
Transport	20	18	18	20	23	25	25	28	28	26	26
Industry	8	8	8	8	6	7	9	7	6	6	6
Jet Fuel Total	2	2	3	3	3	4	4	4	4	4	4
Total Fuel Markets	48	45	47	51	54	60	64	67	69	68	70

***Source**: MEMR, 2015: estimate number*

Indonesia changed its fossil fuel subsidy in 2015, eliminating its subsidy for gasoline, and reducing the subsidy on diesel fuel to a flat IDR 1000 per liter. The GOI has stated that they will review and update the subsidy amount every three months. The Ministry of Energy and Mineral Resources has stated their intention to reduce the diesel subsidy to IDR 500 per liter; however no action has yet been taken.

Fuel use outlook

According to the Indonesian National Energy Council's 2014 Indonesian Energy Outlook, Indonesian fuel consumption is projected to increase by five percent annually during the 2020-2026 periods (Table 2). Indonesian Gasoline use is projected to reach 43 billion liters in 2020 and 60 billion liters by 2026, while diesel fuel use is expected to grow at a slower rate rising to 44 billion liters in 2026.

Table 2. Indonesia, fuel use projection

Fuel Use Projections (Billion Liters)											
Calendar Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Gasoline Total	35	37	38	40	43	45	48	50	54	57	60
Diesel Total	33	33	34	35	37	38	38	40	41	43	44
Transport	26	27	28	29	29	30	31	32	33	34	35
Industry	6	7	7	7	7	7	7	8	8	8	9
Jet Fuel Total	5	5	5	6	6	6	7	8	8	9	9
Total Fuel Markets	72	75	78	81	85	89	93	98	103	108	113

Source: *calculated from Indonesia Energy Outlook 2014, National Energy Council*

III. Policy and Program:

Progress on Plantation Fund for Biodiesel Subsidy

Indonesia's biodiesel subsidy is driving the expansion of palm oil-based biodiesel blending and consumption in Indonesia. The program has been funded since 2015 through an export levy on CPO and CPO derivatives, and is managed by the CPO fund agency (BPDPKS). More than 1 billion liters of biodiesel were absorbed under this program between January and June 2016, using the revenues generated by the levy to cover the difference between the cost of biodiesel and fossil fuels. The fund was established based through regulations 24/2015 and 61/2015, and started in summer 2015.

According to BPDPKS, revenues from the levy are expected to reach IDR 9.5 trillion (about $698 million dollars US) in 2016. The value of the subsidy depends on the difference between the price of biodiesel and the fossil diesel, and is reported to have reached IDR 5000 per liter (37 cents a liter) in April 2016. Despite low fossil fuel prices and strengthening CPO prices, BPDPKS is publicly optimistic that they will be able to continue supplying subsidized automobile fuel at a consistent pace throughout the year. Industry contacts, however, have expressed some doubts regarding this, as the cost of the subsidy continues to grow and fossil fuels show no sign of rebounding prices in the short term. As such, Post believes that biodiesel subsidy volumes may decline later in the year, depending on financial conditions for fuel and CPO.

In the first half of 2016, Indonesia issued regulation 24/2016, allowing the CPO fund to subsidize biodiesel for electricity generation. Industry sources estimate that the quantity of biodiesel required for electricity generation is low, between 200-500 thousand kiloliters (KL) a year. Sources further indicate that demand for electricity generation will remain low, as PLN (Indonesia's National Electricity Company) is reducing its reliance on diesel fuel-based power plants in favor of coal and natural gas. PLN data supports these claims, showing that biodiesel-generated electricity constituted less than 1 percent of Indonesia's total production in 2014, and projected increases would not significantly increase biodiesel's percent share of electricity generation. PLN currently estimates that fossil diesel contributes to seven percent of Indonesia's total electricity generation, and that this will fall to one percent by 2025.

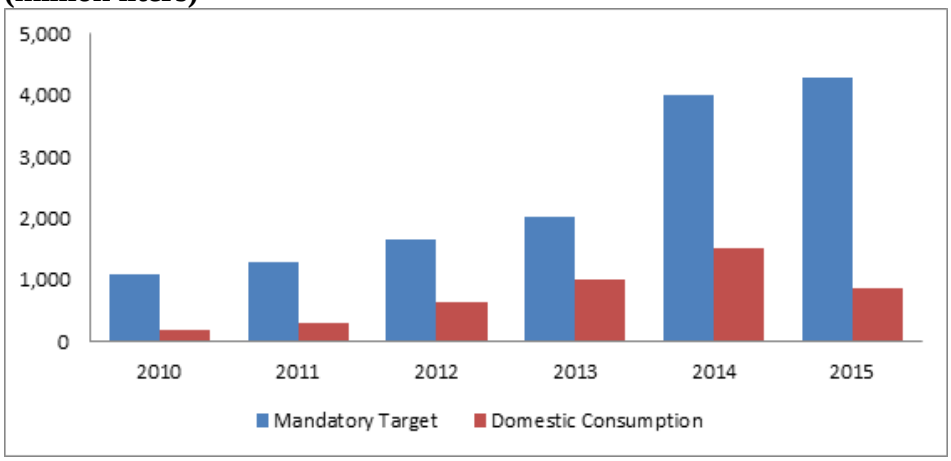
Historic Policy Background

Indonesian biofuels policy is governed by a number of regulations and decrees. Government regulation 1/2006 was an important first step for the development biofuels in Indonesia. The regulation governs the procurement and usage of biofuels. In support of Regulation 1, Presidential decree 20/2006 established a National Biofuels Development Team, which supervises biofuel implementation programs and has created a blueprint for biofuels development. According to the blueprint, biofuels development aims to (1) alleviate poverty and unemployment, (2) drive economic activities through biofuel procurement and (3) reduce domestic fossil fuel consumption. This was followed by Indonesia's House of Representative (DPR), which passed Energy Law (UU 30/2007) to strengthen regulations prioritizing the use of renewable energy and biofuels.

In 2008, the Government of Indonesia (GOI) created a biofuel blending mandate through Ministry of Energy and Mineral Resources (MEMR) Regulation 32. The blending mandate regulation has been revised several times, most recently through MEMR Regulation 12, released in March 2015. This regulation increases mandatory biodiesel blending from 10 percent to 15 percent for transportation and industrial uses. Regulation 12 also increased mandatory blending to 25 percent for electricity generation. Post notes that despite an aggressive mandate, the potential for biofuel electricity generation in Indonesia remains limited.

Indonesia's biodiesel mandates have been aggressive historically. In 2014, blending rates were set at 10 percent for 2014 and 2015. 2015 rates were revised up to 15 percent as per MEMR regulation 12/2015 (See Table 3). Despite the rapid growth of Indonesia's biofuel consumption however, they have yet to reach their blending mandates (See Figure 1). Industry sources confirm that blending has remained below target due to supply shortages, previously caused by infrastructure weaknesses and funding shortfalls for subsidies. Post notes, however, that necessary infrastructure, such as blending facilities and storage tanks, is coming on line. Additionally, Indonesia's new levy is providing a regular funding stream that will maintain biodiesel's competitiveness, even in the face of low global fossil fuel prices.

Figure 1. Domestic Consumption Continues to Fall Far Short of Indonesian Blending Mandates (million liters)



Source: *Post calculation, Ministry of Energy and Mineral Resources.*

Blending mandate regulations define the minimum biofuel quantity used in each end use category for a certain period of year. Table 3 shows GOI plans to increase the percentage use of biodiesel in total diesel consumption up to 2025. This new target would require at least 4.86 billion liters of biodiesel to be blended in the transportation sector in the next year, which does not appear attainable at this time.

Table 3. Indonesia Biodiesel Mandatory Target as stated in Regulation 12/2015

Biodiesel (Minimum)				
Sector	April 2015	2016	2020	2025
Transportation, Public Service Obligation (PSO)	15%	20%	30%	30%
Transportation, Non-PSO	15%	20%	30%	30%
Industry	15%	20%	30%	30%
Electricity	25%	30%	30%	30%

Source: *MEMR Regulation 12/2015*
Note: *Public Service Obligation (PSO) refers to subsidized fuel for road vehicles. It is uniquely sold through Pertamina, an Indonesian state-owned company. Non-PSO refers to unsubsidized fuel sold through private sector shops.*

The GOI's ethanol mandatory schedule is shown in Table 4. Post notes that subsidies are only being implemented for transportation sector biodiesel. Given the lack of ethanol infrastructure, feedstock supply gaps, and the general focus on diesel, the GOI is unlikely to pursue ethanol blending.

Table 4. Indonesia Bioethanol Mandatory Target as Stated in Regulation 12/2015

Bioethanol (Minimum)				
Sector	April 2015	2016	2020	2025
Transportation, Public Service Obligation (PSO)	1%	2%	5%	20%
Transportation, Non-PSO	2%	5%	10%	20%
Industry	2%	5%	10%	20%

Source: *MEMR Regulation 12/2015*
Note: *Public Service Obligation (PSO) for ethanol refers to subsidized fuel used by small scale industry, fishing and agriculture.*

IV. Biodiesel

Production

Indonesia's biodiesel sector weathered a difficult moment in 2015. Faced with sharply lower foreign demand due to low fossil fuel prices and curtailed domestic demand due to a break in subsidy support, biodiesel production dropped to zero in the first half of the year. Indonesia addressed past, only partially successful schemes to support domestic consumption through the creation of the Plantation Fund , but the subsidies were not distributed until later in the year. With its implementation in summer 2015, the fund subsidized more than 300 million liters of biodiesel in 2015. This further jumped to 700 million liters in the first quarter of 2016. The levy currently charges 50 dollars per ton of exported CPO and less for exported, value-added CPO products. Palm oil levy funds are also used to fund replanting activities (primarily for small holders).

CPO is the most commonly available biodiesel feedstock in Indonesia, with production currently estimated at 32 million MT. (Alternate feedstocks such as candle nut, jatropha oil, calophyllum and coconut oil are not available to the industry at competitive prices and/or commercial volumes). Although CPO production is expected to continue to grow, short term supplies are constrained due to an extended drought in 2015. Looking to the long term, production should grow as new plantations reach maturity and old plantations are replaced with higher yielding cultivars.

Indonesia's biodiesel production capacity is growing. At least two refineries came online in 2015/16 with a total production capacity of 877 million liters. An additional 340 million liter refinery is expected

to open in 2016/17. Palm oil refiners report that Indonesia's refining capacity is underutilized, and that refiners must compete in order to secure sufficient quantities of CPO to maintain production levels. Post notes that this situation is aggravated by low CPO yields in 2015/16.

Consumption

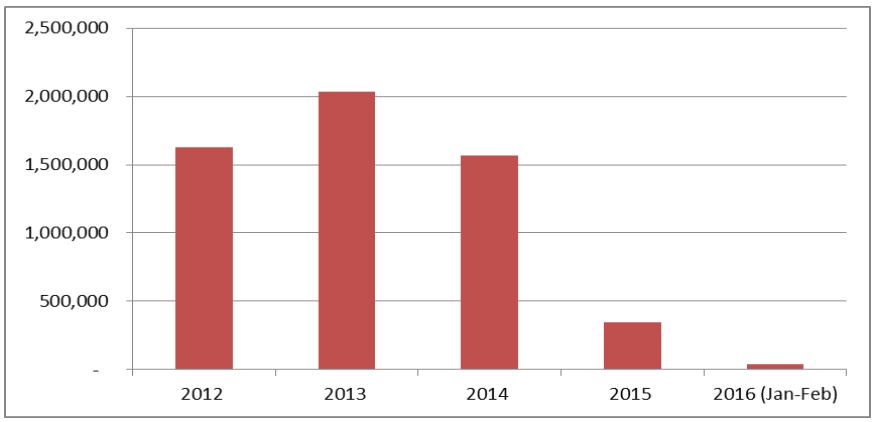
The implementation of Indonesia's palm oil levy has transformed Indonesia's biodiesel consumption. In early 2015, biodiesel consumption had dropped to zero due to low fossil fuel prices and an ineffective support program. Under the new program, biodiesel production jumped, pushing Indonesia's blend rate closer to 8 percent in 2016. This compares favorably with the previous record 6 percent set in 2014, just prior to the collapse in foreign and domestic demand. Post notes that although 8 percent falls significantly short of Indonesia's 20 percent mandate, this marks an aggressive jump from early 2015, when levels were at zero. Indonesian officials remain committed to reaching their 20 percent goal, which remains constrained by cheap fossil fuels and distribution challenges throughout the archipelago. Although Indonesia's biofuel program covers several sectors (including electricity generation, industry, and transport), consumption remains highly concentrated in the subsidized transportation (PSO) sector. PSO use is limited to high population areas, primarily in Java and Sumatra. Biodiesel consumption for electricity is low and is not expected to increase as Pertamina reports a growing reliance on coal-fueled power plants.

The first round of biodiesel procurement covered by the CPO fund subsidy was completed for the period of November 2015 to April 2016 and resulted in the creation of approximately 950 million liters. The second procurement will run from May to October 2016, and is expected to procure 1.5 billion liters of biodiesel. Post expects that consumption will remain below the 20 percent mandate, but will remain robust due to the success of the palm oil levy. As a result, Post estimates that biodiesel consumption will reach 2.2 billion liters in 2016, a sharp increase from 860 million liter in 2015. Multiple variables influence Post's 2017 outlook. These include the price of fossil fuels, the availability of CPO in an increasingly crowded refining industry, production variability due to weather, and supply challenges throughout the archipelago. As a result, 2017 consumption is forecasted to remain on track with 2016 consumption.

Trade

Indonesian biodiesel exports have fallen for three consecutive years as demand in China and Europe dried up due to the increasing competitiveness of fossil fuels and changes in duties. In 2014 exports fell from 1.7 to 1.3 billion liters, and 2015 exports further dropped to 341 million liters. As a result of the expectation that (despite some recovery in oil prices) biodiesel will remain less competitive with fossil diesel, Post expects that Indonesia's biodiesel exports will continue to fall, estimated at 200 million liters in 2016 and 100 million liters in 2017.

Figure 2. Indonesia Biodiesel Exports 2012-2016 (kiloliters)



Source: GTIS

Stocks

Indonesia's 2016 biodiesel stocks are expected to remain low due to rising biodiesel demand and low CPO yields in 2016. 2017 stocks may increase slightly assuming lower exports.

Production, Supply and Demand Statistics

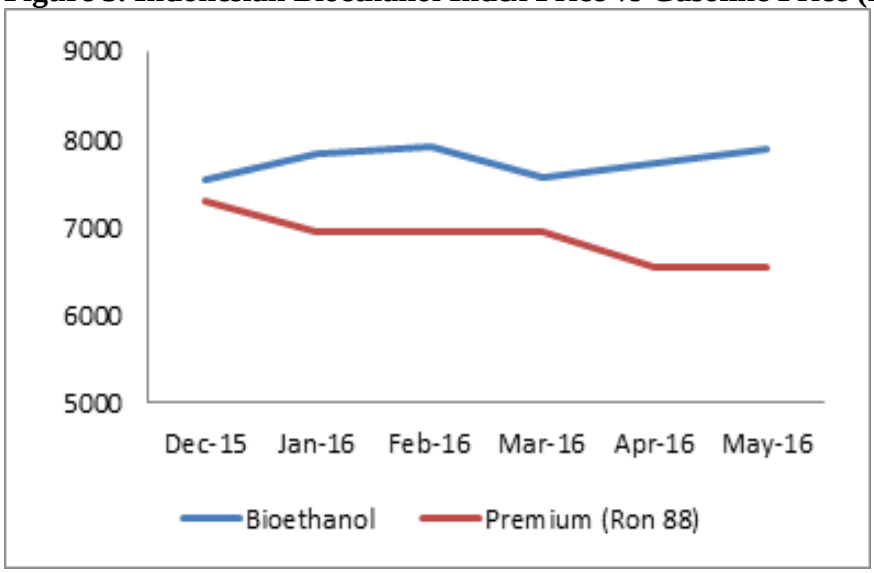
Biodiesel (Million Liters)										
Calendar Year	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Beginning Stocks	18	15	81	38	40	55	7	57	34	34
Production	630	330	740	1,800	2,200	2,800	3,000	1,180	2,450	2,600
Imports	0	0	0	0	0	0	0	0	0	0
Exports	610	204	563	1,440	1,515	1,800	1,350	343	200	100
Consumption	23	60	220	358	670	1,048	1,600	860	2,250	2,400
Ending Stocks	15	81	38	40	55	7	57	34	34	134
BalanceCheck	0	0	0	0	0	0	0	0	0	0
Production Capacity										
Number of Biorefineries	14	20	22	22	26	26	26	27	28	29
Nameplate Capacity	3,138	3,528	3,936	4,281	4,881	5,670	5,670	6,750	7,286	7,628
Capacity Use (%)	20%	9%	19%	42%	45%	49%	53%	17%	34%	34%
Feedstock Use for Fuel (1,000 MT)										
Crude Palm Oil	580	304	681	1656	2024	2576	2760	1086	2254	2392
Market Penetration (Million Liters)										
Biodiesel, transport use	18	48	176	286	637	996	1,520	817	2093	2256
Diesel, transport use	19,992	22,877	25,172	24,772	27,714	27,950	26,437	26,142	26,220	26,966
Blend Rate (%)	0.1%	0.2%	0.7%	1.2%	2.3%	3.6%	5.7%	3.1%	8.0%	8.4%
Diesel, total use	28,112	29,237	32,052	33,712	34,314	34,150	32,767	32,472	32,569	33,495

V. Ethanol

Production

Indonesia has virtually no fuel grade ethanol (FGE) production, having ended their fuel ethanol blending program in 2010. Ethanol industry contacts (including Pertamina representatives) explain that FGE distribution was ended due to inconsistent supply and price volatility, and that the price offered by Pertamina was too low. Post notes that under the former program, bioethanol prices were set by MEMR and based on the Argus average ethanol price, frequently resulting in a purchase price below cost of production.

Figure 3. Indonesian Bioethanol Index Price vs Gasoline Price (IDR per liter)

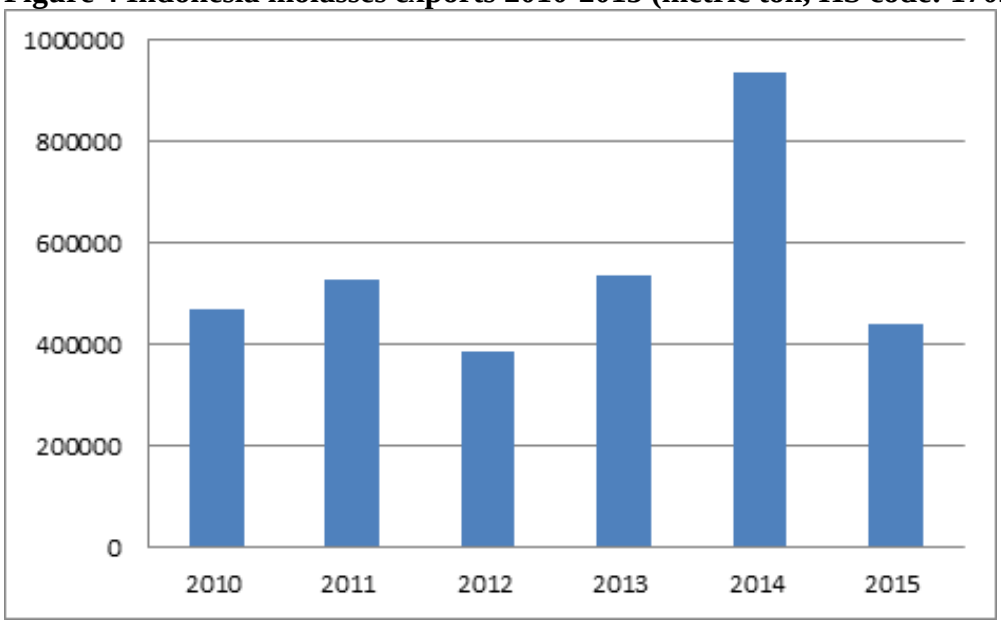


Source: *MEMR*

Indonesia is home to more than 50 sugarcane mills, providing a readily available supply of molasses for ethanol feedstock. Indonesia thus primarily manufactures molasses-based ethanol, although a small quantity is refined from cassava. According to FAS estimates, (see GAIN Report ID1614), Indonesian sugarcane production reached 27.1 MMT in 2014/15 and is expected to increase to 28 MMT in 2015/16 and 2016/17. Post thus expects molasses production to reach 1.4 MMT in 2016, assuming that sugarcane can yield 5 to 6 percent molasses.

Indonesia uses molasses for non-fuel ethanol, amino acid and monosodium glutamate production, and for export. Under normal conditions, Indonesia typically exports 33 percent of its molasses production, an expected 441 thousand MT in 2015 and 2016 (see Figure 4). Amino acid/monosodium glutamate typically consumes 20 to 30 percent of Indonesia's molasses production, while the remainder is used to produce non-fuel ethanol. Non-fuel ethanol applications include pharmacy and hospital products, cosmetics, perfume, and tobacco products. It is also used in the manufacture of acetic acid, ethyl acetate, and methylated spirit.

Figure 4 Indonesia molasses exports 2010-2015 (metric ton, HS code: 1703)



Source: *GTIS*

Indonesia's ethanol refinery capacity has fluctuated since 2007. While its most recent ethanol plant was commissioned in 2014, at least three plants closed between 2008 and 2013. Based on MEMR and association data, Post counts 14 ethanol plants, (operational and idle) with total capacity at 408 thousand KL a year. Only 3 out of 14 plants can produce FGE, with total FGE capacity at 100 thousand KL per year.

Based on the molasses production estimate and the above factors, post expects that Indonesian ethanol production will increase from 205 million liters in 2015 to 207 million liters in 2016.

Consumption

There has not been significant FGE consumption since the end of Indonesia's FGE blending program in in 2010.

Industrial ethanol is mainly used in products including perfumes, cosmetics, pharmaceutical goods and other chemical solvents. Industry contacts confirm that non-fuel ethanol demand is stagnant. Post thus expects ethanol consumption to reach 136 million liters in 2016, with consumption coming from the perfume, cosmetic, pharmacy and chemical solvent industries.

Trade

Industrial ethanol (IGE) exports registered a 29 percent drop in 2015, from 94 to 67 million liters. IGE exports are expected to reach approximately 60 million liters in both 2016 and 2017. January and February 2016 trade data shows Indonesia is on track to meet this target, having reached 11 million liters of export, or 18 percent of the total forecasted exports.

Stocks

Post expects that ethanol stocks will grow slightly based on expected increasing production and stagnant consumption. 2017 stocks are thus expected to reach 36 million liters.

Production, Supply and Demand Statistics

Ethanol Used as Fuel and Other Industrial Chemicals (Million Liters)										
Calendar Year	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Beginning Stocks	33	31	42	36	40	50	37	11	14	25
Fuel Begin Stocks	1	0	0	0	0	0	0	0	0	0
Production	169	172	175	200	205	207	202	205	207	207
Fuel Production	1	1.7	0	0	0	0	0	0	0	0
Imports	0	0	0	1	0	0	2	0	0	0
Fuel Imports	0	0	0	0	0	0	0	0	0	0
Exports	47	33	49	63	59	86	94	67	60	60
Fuel Exports	0	0	0	0	0	0	0	0	0	0
Consumption	124	128	132	134	135	135	135	136	136	136
Fuel Consumption	2	1	0	0	0	0	0	0	0	0
Ending Stocks	31	42	36	40	50	37	11	14	25	36
Fuel Ending Stocks	0	0	0	0	0	0	0	0	0	0
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
Production Capacity										
Number of Refineries	13	12	14	14	15	15	13	14	14	14
Nameplate Capacity	258	288	342	392	392	378	408	408	408	408
Capacity Use (%)	66%	60%	51%	51%	52%	55%	50%	50%	51%	51%
Feedstock Use for Fuel (1,000 MT)										
Molasses	676	688	700	800	820	828	808	820	828	828
Market Penetration (Million Liters)										
Fuel Ethanol	2	1	0	0	0	0	0	0	0	0
Gasoline	20,115	22,073	23,926	26,531	29,278	30,514	30,926	32,627	34,422	35,481
Blend Rate (%)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

VI Advanced Biofuels

Indonesia biofuel industry is uniquely focused on CPO-based biodiesel. There is currently no advanced biofuel industry of significance in Indonesia.