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Indonesia

Bio-Fuels

Biofuels Annual 2007

2007

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Report Highlights:

Biofuel production is expected to increase as new plants being built begin production. However, domestic consumption will be limited by a decrease in the mixture of biofuel with gasoline and diesel, increasing the amount of exports. Government efforts to foster a biofuel industry have seen greater success with encouraging production, but feedstock availability is not growing as quickly.

Includes PSD Changes: Yes
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Annual Report
Jakarta [ID1]
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Executive Summary

Biofuel is currently sold by Pertamina, the government-owned oil and gas company that until recently had a monopoly on retail sales of gas and diesel for transportation use. Pertamina's gasoline and ethanol mix includes 5 percent ethanol, which is sold in 2 retail stations, one in Jakarta and one in eastern Java. Pertamina's diesel and biodiesel mix includes 5 percent biodiesel, which is sold in over 220 stations, mostly in Jakarta. However, Pertamina announced it will decrease the biodiesel in its diesel blend to 2.5 percent following the decline in fossil fuel prices and the increase in crude palm oil prices, while the ethanol concentration will be decreased to 3 percent.

There are two main issues facing the Indonesian biofuel industry, the cost of producing biofuel versus the cost of fossil fuels and the competition for feedstock for fuel and food use. Indonesia has the potential to become a major producer of biofuel. However, there are challenges that the government must address before large scale production can occur. National policy encourages biofuel processing and there have been many announced plans to build processing plants. Preparations for increased processing without an accompanying increase in input availability for at least the short term is creating competition between food and fuel use for feedstock.

Indonesia produces crude palm oil and molasses, which are the primary feedstock used in Indonesian biofuel production. Jatropha and cassava are seriously being considered by Indonesian government officials because of the potential to offer employment in poorer areas not easily served by electricity and because there would be no competition between biofuel and food.

Production

In 2006, there were 2 biodiesel plants and 2 ethanol plants in production. By the end of 2007, FAS/Jakarta estimates there will be a total of 9 biodiesel plants and 4 ethanol plants in production. As a result, biofuel production will increase to 755,000 MT. By the end of 2009, annual biodiesel production could reach 1,000,000 MT and annual ethanol production should reach 390,000 MT. Production capacity will be higher, but the availability of feedstock will be a limiting factor. If available feedstock continues to be a problem or if export markets do not grow, then some producers may choose to halt plans to build production facilities.

Biodiesel Production:

Total production of biodiesel will reach 675,000 MT in 2007, though production capacity is higher. The raw material used most often to produce biodiesel in Indonesia is crude palm oil (CPO) because of the well established CPO industry and potential for the increase in production. Since Pertamina will decrease the biodiesel content by half, production will not reach full potential and exports are expected to grow. An increase in exports can already be seen because of more favorable prices in the international market. By law, Pertamina cannot pay more for its biodiesel than the international market price in Singapore. Estimates are that CPO would need to be closer to prices seen last year for a 5 percent mix to be cost competitive with fossil fuels.

Another potential feedstock is jatropha. It is still in the very early stage of development and currently there are concerns that it is not feasible for large-scale production. At least 2 companies are making serious preparations to use jatropha as a feedstock. Though using jatropha would remove the conflict between food and fuel, jatropha is more labor-intensive and produces less oil than CPO. At this time, Indonesian government efforts appear to be focused on using jatropha in villages where electricity is not cost-effective.

Plants	Oil per hectare	
	Kilogram	Liter
Oil palm	5,000	5,950
Coconut	2,260	2,689
Jatropha	1,590	1,892
Rapeseed	1,000	1,190
Peanuts	890	1,059
Sunflowers	800	952
Soybean	375	446
Corn (maize)	145	172

Source: National Seminar Biofuel, Department of Energy and Mineral Resource, Republic of Indonesia, May 05, 2006

Ethanol Production:

There are two bio-ethanol factories in Indonesia and both use molasses as raw material. Indonesian molasses is preferred because of its high sugar content. Most sugar mills in Indonesia are less-efficient state-owned enterprises and many still use Dutch colonial technology. Though corn has higher yield per hectare, it is too expensive to make production cost effective.

Ethanol producers face several challenges, one of which is disposing liquid waste. Another is that alcohol is strictly prohibited in Indonesia for religious reasons, so sales of ethanol are heavily regulated with high tariffs and taxes.

Indonesian government officials and industry are also looking at cassava as a feedstock for ethanol. Since molasses is also used to produce monosodium glutamate, cassava may be an attractive alternative. At least 2 companies are currently making plans to use cassava as a feedstock.

Currently in Indonesia, 1 ton of molasses yields about 250 liter and 1 ton of cassava yields about 155 liter of anhydrous ethanol.

Planned Production:

At the beginning of 2007, 67 contracts committing to biofuel development were signed by industry and government with an estimated investment value of \$12.4 billion. However, many of these announced plans are for companies with no experience in biofuel production or a related business. In addition the higher price of inputs, the lower price of fossil fuel, and the lack of significant growth in domestic consumption discourage further investment. The incentives provided by the government include favorable interest rates for buying land, which provides some businesses an opportunity to buy land at better than market rates.

Consumption

Indonesia's interest in biofuel also comes from concern over a depletion of oil reserves and a recent sharp increase in retail fuel prices. Government estimates show Indonesia's oil reserves being depleted in less than 20 years. Also, fuel was subsidized until last year by the government. With a worldwide increase in fuel prices and the end of the government fuel subsidy, retail prices for fuel sharply increased.

Pertamina is the only seller of biofuel for transportation at the retail level, so announced plans to decrease the amount of biodiesel and ethanol used in its blends will have a direct impact on domestic consumption.

Pertamina sells a mixture of 5 percent biodiesel with petroleum diesel in 210 petrol stations in Jakarta and 12 petrol stations in Surabaya. Due to the high price of the raw materials, such as CPO and methanol, Pertamina is reducing the biodiesel mixture to 2.5 percent.

Pertamina sells a mixture of 5 percent ethanol with gasoline in 1 petrol station in Malang, East Java and 1 petrol station in Jakarta. Pertamina is also reducing the ethanol mixture to 3 percent.

Fuel Consumption 2006 (in Kiloliter)		
	Transportation	Industry
Gasoline	17,000,000	35,000
Diesel	11,000,000	15,000,000

Source: Ministry of Energy and Mineral Resources

According to government plans, jatropha oil will largely be used to create villages that are energy self-sufficient. The jatropha oil will substitute for kerosene, popularly used for stoves. Plans are to create 1,000 self-sufficient energy villages utilizing 1 million kiloliters of jatropha oil by 2010.

Trade

Indonesia exports biodiesel in the form of FAME (Fatty Acid Methyl Ester), which is to be blended with diesel in the destination country. Most Indonesian exports of biodiesel are to China and other Asian markets. There are also sales to the European Union and the United States. Biodiesel sales to the European Union are limited because of concerns over the freezing point of biodiesel from CPO. Ethanol sales to the United States are limited because of competition with Brazil, which has an advantage due to lower freight costs.

Initial trade reports for 2007 indicate that Indonesian exports to China of CPO derivatives are increasing. It is expected that the trend will continue. Recent price increases in Indonesia for other CPO-derived products including cooking oil, have seen sharp increases, suggesting that CPO supplies in Indonesia are under pressure. In addition, Malaysia and Indonesia are the major suppliers of CPO to China. However, Indonesia is the producer that has the capability to continue supplying the Chinese market at China's current import levels.

The main export market for Indonesian ethanol is Japan. It is expected that the trend of Indonesian ethanol replacing Brazilian product in this market will continue.

There are no specific harmonized tariff codes for biodiesel and ethanol. Therefore, FAS/Jakarta assumes Indonesian biodiesel exports are under 1516.20, which is the best category for FAME and other CPO-derivatives, and ethanol is under 2207.10, which includes ethanol with 80 percent purity and higher.

Policy

Despite government allocations of \$2.8 billion towards biofuel development, the five banks appointed for the program have only realized about \$310,000 in investment, despite an interest rate subsidy of 5 percent.

Indonesia established a National Team for Biofuel Development, which has the goals of alleviating poverty, create jobs, and encourage economic development. The national team is an independent team that coordinates with government ministries, the private sector, and non-governmental organizations to foster the development of biodiesel from CPO and jatropha and ethanol from molasses and cassava.

The National Team of Biofuel Development 2010 targets are:

1. Create 3.5 millions jobs for the unemployed.
2. Increase income for on-farm and off-farm workers in biofuel sectors up to Regional Minimum Wages levels.
3. Develop biofuel plantations on 5.25 million hectares land.
4. Create 1,000 self-sufficient energy villages and 12 special biofuel zones.
5. Reduce fossil fuels by at least 10 percent.
6. Save \$10 billion in foreign exchange reserves.
7. Improve biofuel local demand and exports.

The Team is to develop 12 special biofuel zones in order to simplify the bureaucratic requirements for biofuel investment:

1. Pacitan – Wonogiri – Wonosari (Central and East Java): cassava
2. Garut – Cianjur – South Sukabumi (West Java): cassava
3. Lebak – Pandeglang (West Java): jatropha
4. Lampung – South Sumatera – Jambi (southern part of Sumatera): cassava, sugarcane, jatropha, oil palm
5. Riau (southern part of Sumatera): oil palm
6. Aceh (northern part of Sumatera): cassava, sugarcane, jatropha
7. East Kalimantan: jatropha, oil palm
8. Sulawesi: cassava, sugarcane, jatropha, oil palm
9. Nusa Tenggara: cassava, Jatropha curcas
10. North and West Papua: oil palm
11. Merauke – Mappi – Boven Digul – Tanah Merah (Papua island): cassava, sugarcane, jatropha, oil palm

Local governments are also to develop feedstock potential appropriate to their area.

Note:

US\$ 1 = Rp. 8,800 as of May 30, 2007.

Density biodiesel: 0.88 gr/cm^3 ; bioethanol: 0.79 gr/cm^3

1 MT of biodiesel = 1.136 Kiloliter

1 MT of ethanol = 1.267 Kiloliter

PSD Table

Quantity of Feedstock

Quantity of Feedstock Use In Biofuel Production					
Biodiesel Vegetable Oil	2003	2004	2005	2006	2007
	(in MT)				
Soybean Oil	0	0	0	0	0
Rapeseed Oil	0	0	0	0	0
Palm Oil	11,500	14,000	15,400	15,900	17,100
Coconut Oil	0	0	0	0	0
Animal Fats	0	0	0	0	0
Recycled vegetable oil	0	0	0	0	0
Other	0	0	0	0	0
Ethanol					
Corn	0	0	0	0	0
Wheat	0	0	0	0	0
Sugarcane	0	0	0	0	0
Sugar beet	0	0	0	0	0
Rye	0	0	0	0	0
Molasses	0	0	0	27,000	23,436
Wood	0	0	0	0	0
Cassava/tubers	0	0	0	0	0

Biofuels Production

Biofuel Production/Consumption/Trade (000 MT)					
	2003	2004	2005	2006	2007
Biodiesel					
Beginning stocks	0	0	0	0	0
Production	0	0	8	70	675
Imports	0	0	0	0	0
Total supply	0	0	8	70	675
Exports	0	0	6	46	573
Consumption	0	0	2	24	102
Ending stocks	0	0	0	0	0
Ethanol					
Beginning stocks	0	0	0	0	0
Production	0	0	0	36	100
Imports	0	0	0	0	0
Total supply	0	0	0	36	100
Exports	0	0	0	30	90
Consumption	0	0	0	6	10
Ending stocks	0	0	0	0	0

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