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Biodiesel Demand and Supply Outlook

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Bio-Fuels

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Report Highlights:

In 2011, under the Thai Government's current biofuel policy, all diesel sold in Thailand must be B5 biodiesel. If implemented, Thailand will need to import 200,000 tons of feedstock in 2011 to meet demand. These imports would continue until 2015 when domestic production is expected once again to offset imports.

Executive Summary:

In June 2010, the Government is scheduled to replace the compulsory production of B2 with B3 and by 2011 it intends to implement compulsory B5 use for all diesel consumption.

Under this scenario, Post estimates that demand for B100 palm oil biodiesel will increase sharply from 655 million liters in 2010 to 935 million liters in 2011, translating to an increased demand for crude palm oil (CPO) from 618,000 tons to 882,000 tons in 2011.

The government has encouraged oil palm cultivation to meet its policy goals. However, new plantings have fallen short of the program's goals. Post's analysis of the proposed policy indicates that, in order to meet demand, Thailand will require to import 200,000 tons of feedstock (CPO or stearin) in 2011. These imports would continue until 2015 when increasing domestic supplies are expected to meet the required demand. Insufficient domestic supplies could lead to escalating domestic prices that would affect other end-users such as cooking oil refining operations.

Key Development: Production Mandates and Tax Incentives

In 2005, Thailand began a campaign to promote biodiesel production and consumption to ease its reliance on fossil fuels. Initial production of biodiesel was insignificant until February of 2008, when the Government adopted a policy requiring compulsory production of B2 biodiesel (high-speed diesel with the two percent of B100 content by weight). It extended this policy by providing tax breaks for the use of B5 biodiesel, which resulted in retail prices lower than those for B2 (See Table 1.).

Table 1: A Breakdown of Retail Prices for B2 and B5 Biodiesel As of May 10, 2010

	B2 Biodiesel (Baht/liter)	B5 Biodiesel (Baht/liter)
Ex-Refinery Prices	19.77	20.08
Excise Tax	5.31	5.04
Municipal Tax	0.53	0.50
Oil Fund Fee	0.85	-0.80
Conservation Fund Fee	0.05	0.25
Wholesale Prices	26.51	25.07
Value Added Tax	1.86	1.76
Wholesale Prices + VAT	28.37	26.83
Marketing Margin	1.42	1.74
Value Added Tax	0.10	0.12
Retail Prices	29.89	28.69

Source: Ministry of Energy

Note: Conservation fund fee is not consistent. Upon a cross-check, the Thai official is not able to explain.

Due to this price differential, sales of B5 biodiesel increased sharply from 23 percent of total high-speed diesel sales in 2008 to 45 percent in 2009 when average B5/B2 price difference was increased to

2.06 baht/liter. However in January and February of 2010, the B5 market shares dropped to 44 percent and 41 percent, as the price differential contracted to 1.20 baht/liter. The movement in the spread is due to fluctuations in world oil prices and the government's changes in the application of the oil fund fee to meet its portfolio goals.

By June 2010, the government will modify its requirement so that the compulsory production of B2 is replaced with B3 as the government foresees sufficient crude palm oil (CPO) production to implement this policy. By 2011, the entire diesel supply sold in the country must be B5.

Demand

The table below forecasts biodiesel sales from 2009-2015 which has been translated to estimate the demand for B100 biodiesel and feedstock. Feedstock demand will grow 7.5 percent in 2010 and will have the highest growth rate in 2011 of 43 percent. The demand estimates are based on government production mandates of B2 (which began in 2008), B3 (anticipated to begin in June 2010), and B5 (anticipated to begin in 2011). Feedstock for B100 production is palm oil products including crude palm oil (CPO), refined bleached deodorized palm oil (RBD), and stearin.

Table 2: Demand for Feedstock Based on Biodiesel Sales

Year	Biodiesel Sales (Million Liters)	Demand for B100 (Million Liters) 1/	Demand for feedstock (CPO/RBD/Stearin) (Thousand Metric Tons) 2/	%Δ in Feedstock
2009	18,214*	609*	575	NA
2010	18,400	655	618	7.5
2011	18,700	935	882	42.7
2012	19,200	960	901	2.2
2013	19,500	975	920	2.1
2014	20,000	1,000	943	2.5
2015	20,600	1,030	972	3.1

* = actual biodiesel sales and B100 demand in 2009

1/ Estimated market shares for B2, B3, and B5 in 2010 = 25:35:40

Estimated B5 market share from 2011-2015 = 100%

2/ 1.0 liter of B100 production is derived from 1.06 kgs of CPO/RBD/Stearin

CPO = Crude Palm Oil, RBD = Refined Bleached Deodorized palm oil

Supply

Biodiesel production in Thailand relies on two key industries: palm oil production for feedstock and B100 processing industry for blending material.

1) Outlook of Feedstock Supplies from Palm Oil Industry

In 2005, the Cabinet approved a budget of 1,300 million baht (approx. USD 34 million) to promote palm production by providing low-interest loans tied in with a sectorial development plan. This plan was set by a joint working group from the Ministry of Agriculture and Cooperatives and the Ministry of Energy, "Committee on Biofuel Development and Promotion" (CBDP), which aimed at expanding the palm growing area by 400,000 hectares from 2008 to 2012 or 80,000 hectares annually. Additionally, the committee set goals of increasing palm harvest from 19 tons/hectare to 22

tons/hectare, and the crushing rate of crude palm oil from 17 percent to 18.5 percent by 2012. To achieve the plan, the RTG provided low-interest loans to participating oil palm farmers. This development was reported in the [2009 Biofuel Annual GAIN Report](#).

However, increasing palm plantings to meet demand has been challenging. Harvested palm area reported by Office of Agricultural Economics (OAE) increased by 33,600 hectares in 2008, 48,700 hectares in 2009, and an estimated 45,000 hectares in 2010, compared to the annual target of 80,000 hectares. Slower-than-expected expansion is attributed to more attractive returns from rubber production. The RTG adjusted its campaign by promoting palm plantation in non-rubber areas in the North and Northeast regions of Thailand. The growing area in these two regions is estimated at 2,000-3,000 hectares and should come into production in 2012.

Based on the OAE figures and projections, the following assessment on production, supply and demand table for palm oil from 2009-2015 have been developed.

Table 3: Supply, Production, and Demand for Crude Palm Oil in Thailand (2009-2015)

Marketing Year Begin	2009 01/09	2010 01/10	2011 01/11	2012 01/12	2013 01/13	2014 01/14	2015 01/15
Area Planted	500	530	550	590	620	650	690
Area Harvested	450	470	490	510	540	580	610
Trees	0	0	0	0	0	0	0
Beginning Stocks	140	40	62	70	57	87	94
Production	1345	1450	1600	1700	1850	1950	2050
MY Imports	7	50	200	150	100	50	0
MY Imports from U.S.	0	0	0	0	0	0	0
MY Imports from the EU	0	0	0	0	0	0	0
TOTAL SUPPLY	1492	1540	1862	1920	2007	2087	2144
MY Exports	67	20	30	40	30	30	30
MY Exports to the EU	8	8	8	10	10	10	10
Industrial Consump for Non-Biodiesel	330	340	355	370	390	410	430
Industrial Consump for Biodiesel	575	618	882	901	920	943	972
Food Use Dom. Consumption	440	460	480	500	525	550	580
Feed Waste Consumption	40	40	45	52	55	60	65
TOTAL Dom. Consumption	1452	1478	1792	1863	1920	1993	2077
Ending Stocks	40	62	70	57	87	94	67
TOTAL DISTRIBUTION	1492	1540	1862	1920	2007	2087	2144

As of May 2010

Under the current government plans to enforce compulsory B5 production in 2011, the domestic supply is insufficient to meet the government's requirements, unless Thailand imports 200,000 tons of feedstock (CPO or stearin) in 2011 or ease the implementation of the B5 regulation. Imports could continue until 2015 when domestic supply is expected to meet the demand.

2. Current Status of B100 Processing Industry

In Thailand, crude palm oil (CPO), RBD palm oil, and palm stearin are currently used to produce biodiesel. In 2005, the Office of the Board of Investment (BOI) of the Ministry of Industry provided a framework that provides tax incentives for B100 biodiesel processors. These incentives take form as waivers of import duties on machinery and accessories, and corporate income tax for eight years. Due to these incentives, 14 B100 processing plants were established from 2005-2009. However, the industry quickly expanded and the current production capacities far exceed actual B100 demand. Details on individual plant capacity and actual production as of November 2009 reported by

Department of Energy Business (DEB) are provided in the table below, which indicates a 25 percent capacity utilization.

Table 4: A List of Biodiesel Plants in Thailand and Their Capacities

Processing Plant	Location	Production Capacity (Liters/day)	Average Actual Production (Liters/day) in Nov 2009
1. Bangchak Petroleum	Bangkok	50,000	2,967
2. Bioenergy Plus	Ayudhaya	100,000	0
3. Absolute Energy	Prachinburi	800,000	188,724
4. Patum Vegetable Oil	Patumthani	1,400,000	576,989
5. Bangkok Alternative Energy	Chachoengsao	200,000	41,667
6. Green Power Corporation	Chumporn	200,000	90,203
7. A.I. Energy	Samutsakorn	250,000	41,173
8. Weerasuwan	Samutsakorn	200,000	11,185
9. Thai Oleo Chemical	Rayong	685,800	307,000
10. New Biodiesel	Suratthani	220,000	93,162
11. Pure Biodiesel	Rayong	300,000	111,787
12. Siam gulf Petrochemical 1/	Petchaburi	1,200,000	0
13. E-Ether	Chiang Rai	50,000	1,300
14. Bangchak Biofuel 2/	Ayudhaya	300,000	0
TOTAL		5,955,800	1,466,157

Note: Plants no. 1, 9 and 14 belong to two major petroleum oil refineries, i.e. PTT and Bangchak

1/ Stop operation in Feb 2009

2/ Began operating in Dec 2009

Source: Department of Alternative Energy, Ministry of Energy

Industry sources reported that nearly all B100 producers have suffered continued losses since 2008. At least 4 plants are currently suspending their operation. The losses of B100 processors are caused by high production costs due to capacity under-utilization and an oligopolistic market structure that favors B100 buyers, all of whom are petroleum oil refineries.

Although production of B100 is closely adjusted to actual demand, which currently stands at 1.7-1.8 million liters per day, B100 producers are at disadvantage as the few petroleum refineries seem able to influence market prices. Trade sources cited that actual prices paid to CPO B100 producers are 2-3 baht/liter and 3-4 baht for stearin B100 below reference prices¹. Prices for stearin B100 are sold at 1-2 baht/liter below CPO B100 due to a presence of “cloud point” appearance in stearin-derived B100. Due to this situation, all producers sold their products below cost for most of 2009.

Some B100 producers who own feedstock processing plants (i.e., CPO crushing plants or cooking palm oil refinery) have enjoyed lower production costs than processors without feedstock processing. The latter group struggled to reduce their production costs by switching from CPO raw material to cheaper stearin in 2008. Nevertheless, this switch pushes stearin prices higher resulting in the disappearance of the price differential over CPO as prices increased from 14-15 baht/kg in late 2008 to 27-28 in mid 2009.

The table below illustrates cost difference for B100 derived from two main feedstocks, CPO and stearin, and average Reference Prices.

Table 5: B100 Production Cost and Margin

Month	Reference Prices for B100 announced by the Committee (1)	Average Cost for B100 derived from CPO (baht/liter) (2)	Margin b/w Reference Prices and Cost (baht/lit) (3) = (1)-(2)	Average Cost for B100 derived from stearin (baht/liter) (4)	Margin b/w Reference Prices and Cost (baht/lit) (5) = (1)-(4)
2009					
January	24.82	25.00	-0.18	17.37	7.45
February	24.89	27.46	-2.57	19.49	5.40
March	26.96	23.38	3.58	20.06	6.90
April	24.96	25.62	-0.66	23.98	0.98
May	29.73	29.78	-0.05	27.97	1.76
June	31.00	27.82	3.18	28.84	2.16
July	27.89	24.25	3.64	26.98	0.91
August	27.31	26.00	1.31	25.57	1.74
September	27.88	24.20	3.68	25.22	2.66
October	25.45	23.12	2.33	22.68	2.77
November	26.87	25.46	1.41	25.76	1.11
December	29.77	28.19	1.58	27.35	2.42
Average	27.29	25.86	1.44	24.27	3.02
2010					
January	31.45	27.70	3.75	27.62	3.83
February	29.53	27.10	2.43	27.13	2.40
March	30.53	27.27	3.26	27.86	2.67

Note: Average cost for B100 = feedstock price X 3.00/1.06

Conclusion

- Increasing palm plantings to cope with demand has been challenging. To meet demand under the Government's current policy, Thailand will need to import feedstock from 2011-2014 or must opt to modify its implementation plan.
- Possible insufficient domestic CPO supplies may lead to escalating domestic prices for CPO and stearin.
- The prevailing high under-utilization of production capacity for all B100 plants should not attract any newcomers in this industry in the next 3-5 years. In addition, existing producers with limited funding may be out of business or sell them to new investors.

¹ Reference prices are calculated and announced on a weekly basis by Energy Policy and Planning Office (EPPO), Ministry of Energy, to reflect B100 production cost at a certain period. The government uses these reference prices to calculate an Oil Fund fee. However, both B100 producers and buyers use the reference prices as a basis for negotiating actual prices for their trade.