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Biofuels Annual

Philippine Biofuels Situation and Outlook

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Report Highlights:
The Philippines is a major producer and user of renewable energy (RE) and has for years required biodiesel and ethanol in local petroleum diesel fuel and gasoline. In 2011, 41% of all Philippine energy was renewable. Biofuels comprised just 2-3% of total RE production. As the country is the worlds' top coconut oil producer, there have been no compliance issues meeting the mandated 2% biodiesel blend. Nor are any problems anticipated with meeting the 5% mandate currently scheduled to take effect by the end of 2013. Compliance with the 10% mandated ethanol blend in gasoline, however, is another story. Inadequate capacity of existing sugarcane distilleries, low productivity, and high production costs erode the competitiveness of locally grown sugarcane. Challenges to local production are compounded by commitments under regional free agreements that will open the door to Thai sugar and ethanol. As a

result, investors are hesitant to establish more ethanol refineries, and imported ethanol is expected to fill in the gap (estimated at 83% in 2013) between local production and mandated requirements for the foreseeable future.

Post:
Manila

Executive Summary:

The Philippines is a global leader in renewable energy (RE) use and production. When the Renewable Energy Act or Republic Act 9513 (RA 9513) was signed in 2008, the country was already the second largest producer of geothermal energy (next to the U.S.), and had established the first commercial wind farm in Southeast Asia. It had likewise set up the first grid-connected solar photovoltaic power plant in the region. In 2011, RE sources accounted for 41% of the country's primary energy supply. The Philippine government (GPH) has set a goal to triple RE capacity through 2030 under the Philippines energy plan.

The Philippines Biofuels Act of 2006 (Republic Act 9367) mandated the blending of biodiesel and ethanol in all locally distributed diesel and gasoline (currently at 2% and 10%, respectively). Sugarcane and coconut oil are the preferred Philippine ethanol and biodiesel feedstocks, respectively. Since 2007, when RA 9367 took effect, compliance with the mandated biofuels blends has been mixed, with biodiesel doing well and ethanol encountering more challenges.

The Philippines success in biodiesel is primarily due to it being the world's top coconut oil producer. In 2012, there were nine biodiesel producers operating with an aggregate annual capacity of 393 million liters (Ml). There have been no compliance issues with the mandated 2% biodiesel blend in diesel fuel due to adequate feedstock and refineries. The local coconut industry successfully lobbied for a higher 5% blending requirement, which has been incorporated in the country's national energy and biofuels programs. While the new 5% blending requirements is scheduled to take effect by the end of 2013, some analysts think this could be delayed if coconut oil prices are too high.

Compliance with the current mandated 10% ethanol-gasoline blend, on the other hand, continues to be unmet due to the inadequate capacity and competitiveness of existing sugarcane distilleries. The Philippines' four ethanol refineries have a combined annual capacity of 133 Ml, but produced just 16 Ml in 2012, roughly 6% of total ethanol consumption. Despite the incentives offered to potential biofuel (and RE) investors and an assured market, investments have been inadequate. Although the country is a major sugarcane producer, low productivity and high production costs erode the competitiveness of locally grown sugarcane. Local average sugarcane production of 60 tons/hectare is one of the lowest in Asia. These competitive challenges are compounded by trade liberalization commitments under existing regional free trade agreements, specifically, the ASEAN-FTA or AFTA. Under the AFTA, Philippine tariffs on sugar will go from 18% in 2013 to 5% in 2015. As a result, imported ethanol is expected to satisfy the gap between local production and mandated blend requirements.

Author Defined:

II. Policy and Programs

Fuel Use Projections (Liters - specify unit)									
Calendar Year	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Gasoline Total	3,819	3,921	4,023	4,125	4,227	4,329	4,431	4,533	4,635
Diesel Total	7,382	7,499	7,616	7,733	7,850	7,969	8,086	8,203	8,320
On-road	5,832	5,924	6,017	6,109	6,202	6,295	6,388	6,480	6,573
Agriculture									
Construction/mining									
Shipping/rail									
Industry									
Heating									
Jet Fuel Total	1,752	1,787	1,821	1,855	1,889	1,924	1,958	1,993	2,027
Total Fuel Markets	12,953	13,206	13,460	13,713	13,966	14,222	14,475	14,728	14,981

*Please see Statistical Section

The lead agency responsible for the Philippine Biofuels Program is the Department of Energy (DOE). The DOE's energy strategy for the country is outlined in the Philippine Energy Plan 2012-2030 (PEP 2012-30) and National Biofuels Plan (NBP 2013-2030). The PEP 2012-2030 reflects the Philippine government's (GPH) mission to ensure the delivery of secure, sustainable, sufficient, affordable and environment-friendly energy to all economic sectors. The NBP 2013-2030, on the other hand, is a preliminary assessment of the previous National Biofuels Program for the period 2007-2012 (NBP 2007-2012), and outlines the short-, medium- and long-term plans of the National Biofuels Board (NBB). The NBB is chaired by the DOE. Both the PEP and the NBP are often reviewed and assumptions adjusted and revised. Unless otherwise specified, energy figures in this report are largely based on the PEP 2012-30 and NBP 2013-2030.

The Biofuels Act that was signed in January 2007 made the Philippines the first country in Southeast Asia to have biofuels legislation in place. The Biofuels Act was aimed at reducing dependence on imported fuels, enhancing the quality of the environment, and creating opportunities for countryside development. RA 9367 mandated a minimum 1% biodiesel blend in all diesel fuels by February 2007, to increase to a 2% blend after 2 years. RA 9367 also mandated that by February 2009, at least 5% ethanol shall comprise the annual total volume of gasoline sold and distributed by oil companies in the country, increasing to a 10% blend (with certain exempt gasoline grades) by February 2011. Implementation of the 10% blend was subsequently extended by the Philippine Department of Energy (DOE) to August 2011 by virtue of Department Circular No. 2011-02-0001 (refer to Ethanol, Production Section). This suspension of implementation led to a sharp decline in production that year. Despite market incentives, compliance with the ethanol blend using locally produced ethanol has fallen far short of target levels.

The Philippines was 60% energy sufficient in 2011 with supply reaching 39.4 million tons of oil equivalent (MTOE). Of total domestic energy, RE sources accounted for 41 %, broken down as follows: geothermal (22%), biomass (12%), hydro (6%), biofuels (1%), and wind and solar sources accounting for the balance (< 1%). Oil accounted for 31%, coal for 20% and natural gas 8% of overall energy in 2011.

PRIMARY ENERGY SUPPLY - 2011

	(%)
Oil	31
Geothermal	22
Coal	20
Biomass	12
Natural Gas	8
Hydro	6
Wind & Solar	0
Biofuels	1
TOTAL	**100**

Source: Philippine Energy Plan 2012-2030

On the demand side, final energy consumption in 2011 was at 23.0 MTOE with oil products accounting for 49%, followed by biomass (21.1%), electricity (21%), coal 8%, biofuels 1% and natural gas 0.3%.

While transportation continued to be the dominant energy consuming sector in 2011, comprising almost 35% of total energy demand, residential surpassed industrial as the nations #2 energy consumer.

FINAL ENERGY CONSUMPTION – 2011		
by Sector	%	MTOE Equivalent
Transport	34.7	7.98
Residential	26.1	6.00
Industrial	25.9	5.96
Commercial	11.9	2.74
AFF	1.3	0.30
Note - Total Energy Consumption (MTOE) = 23.0		

Source: PEP 2012-2030 and Post computations (of MTOE equivalent)

Within the transportation sector in 2010 (latest data available), road transport accounted for 79% of the overall sectors' energy consumption followed by international civil aviation (11%), water transport (8%), domestic air and rail transport (3%). Petroleum products supplied 97.9% of the sector's total energy demand in 2010, with diesel taking the biggest share (48%), followed by gasoline (32%). Diesel is mainly used by the local public utility vehicles.

Many parts of existing roads are in poor condition, and only a minority of the overall network is paved (i.e., national roads and highways). The current Aquino administration is pursuing programs that hopefully will provide the public with quality infrastructure facilities by 2030. Central to its infrastructure development program is a public-private partnership (PPP) initiative. The GPH also aims to attain better interconnection between major islands. As an archipelago of more than 7,100 islands, water transport plays a major role in the movement of cargo and people.

The Philippines is one of the fastest growing economies in the ASEAN region, and increased energy demand an inevitable result. According to the 5th edition of the APEC Energy Demand and Supply Outlook, the country's final energy demand is expected to expand at an average annual rate of 2.9% from 2010 to 2035. This would translate to a total final energy demand of 49 MTOE by 2035, more than double the 2010 level of 23.8 MTOE. (Post, however, estimates strong economic growth will cause energy demand to increase more rapidly than 2.9% per year).

According to the same study, the Philippine transport sector is projected to grow at an average annual

rate of 3.3% through 2035. Inclusive of international transport, the sector is projected to account for 42% share of total energy consumption, and dominate total final energy demand through 2035. Post utilizes a more modest growth of total fuel use (2.53%) in the Fuel Use Projections Table due to delays in the implementation of PPP-infrastructure development projects. A more detailed description of assumptions used is provided in the Statistical Section.

RE sources (including biofuels) have played a considerable role in the Philippines primary energy supply for a number of years. In 2008, when the Renewable Energy Act or Republic Act 9513 (RA 9513) was signed, the country was world's second largest producer of geothermal energy (next to the U.S.). It was also the first country in Southeast Asia to establish a commercial wind farm as well as the first grid-connected solar photovoltaic power plant.

By 2030, the GPH aims to triple RE capacity. Specific RE targets are provided in the following table and provide measurable targets of the National Renewable Energy Program 2011-2030 (NREP). Launched in June 2011, the NREP sets indicative interim targets for RE development during the 2011-2030 period, and is consistent with the objectives of the PEP 2012-30.

ENSURE ENERGY SECURITY				
Triple the RE capacity by 2030				
Sector	**Short Term**	**Medium Term**	**Long term**	**TOTAl**
	(2011-2015)	(2016-2020)	(2021-2030)	(MW)
Geothermal	220	1100	175	1495
Hydropower	341.3	3161	1891.8	5394.1
Biomass	276.7			276.7
Biofuels	2011-DC on E10	2020-PNS for B20 & E85	2025-DC on B20 & E85	
	2012-Mandatory E10 to all gasoline	2020-DC on B10 & E20		
	2014-PNS for B5			
	2015-DC on B5			
	2015-Mandatory B5 to all diesel			
Wind	200	700	1445	2345
Solar	50	100	200	350
Ocean power	0	35.5	35	70.5
TOTAL (MW)	**1088**	**5096.5**	**3746.8**	**9931.3**

Notes: 1. DC – Department Circular
2. PNS – Philippine National Standard

Source: NREP 2011-2030

As an incentive, RA 9513 provides Feed In Tariffs or FITs (i.e., energy supplied to the grid) to producers of RE at a guaranteed fixed price. The DOE in June 2011 approved the following FITs:

- Biomass - P7 ($0.17) per KWh
- Hydro - P6.15 ($0.15) per KWh
- Wind - P10.37 ($0.25) per KWh
- Ocean energy - P17.65 ($0.42) per KWh

- Solar power - P17.95 ($0.42) per KWh

Local RE developers will be allowed to put up a total of 760 MW within a 3-year period, following the issuance of the FITs broken down as follows:

- Biomass - 250 MW
- Hydro - 250 MW
- Wind - 200 MW
- Ocean energy- 10 MW
- Solar power- 50 MW

In line with its plan to triple RE capacity by 2030, the DOE aims to have 30% of all public utility vehicles on alternative fuels as part of its drive to promote a low-carbon future, according to the PEP 2012-2030. To achieve this, it intends to expand the number of compressed natural gas and auto-LPG vehicles, deploy more electric vehicles and reach 20% biofuels blending by 2030. The following biofuel mandated blends are being targeted through 2030.

Targeted Biofuel Blends, 2013-2030					
Target Blends	2013-2015	2016	2020	2025	2030
Bioethanol	E10	E10	E10	E20	E20/E85
Biodiesel	B5	B5	B10	B20	B20

Source: National Biofuels Plan 2013-2030

III. Ethanol

Ethanol Used as Fuel and Other Industrial Chemicals (Million Liters)									
Calendar Year	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Beginning Stocks	0	0	0	0	0	0	0	0	0
Fuel Begin Stocks	0	0	0	0	0	0	0	0	0

Production									
Fuel Production	0	0	1	23	10	4	16	50	70
Imports									
Fuel Imports	0	3	13	64	140	215	248	248	251
Exports									
Fuel Exports	0	0	0	0	0	0	0	0	0
Consumption									
Fuel Consumption	0	3	14	88	151	219	264	298	321
Ending Stocks									
Fuel Ending Stocks	0	0	0	0	0	0	0	0	0
Production Capacity									
Number of Refineries	0	0	1	2	3	3	4	4	5
Nameplate Capacity	0	0	9	49	79	79	133	133	163
Capacity Use (%)	0%	0%	11%	48%	13%	5%	12%	38%	0
Co-product Production (1,000 MT)									
Co-product A	0	0	4	107	47	19	73	231	323
Co-product B	0	0	0	0	0	0	0	0	0
Feedstock Use (1,000 MT)									
Feedstock A	0	0	15	358	156	64	242	769	1,077
Feedstock B	0	0	0	0	0	0	0	0	0
Feedstock C	0	0	0	0	0	0	0	0	0
Feedstock D	0	0	0	0	0	0	0	0	0
Market Penetration (Million Liters)									
Fuel Ethanol	0	3	14	88	151	219	264	298	321
Gasoline	3,819	3,921	4,023	4,125	4,227	4,329	4,431	4,533	4,635
Blend Rate (%)	0.0%	0.1%	0.3%	2.1%	3.6%	5.1%	6.0%	6.6%	6.9%

Note: 2013 and 2014 numbers are Post's estimates

Production, Ethanol

In 2012, the Philippine ethanol industry had 4 active players with a combined capacity of 133 million liters (Ml). Only one new refinery started operations in late 2012. It is so far the country's largest bioethanol facility with an annual capacity of 54 Ml. Despite over 130 Ml capacity, production of ethanol in 2012 was estimated by the GPH to reach just 15.7 Ml.

Philippine ethanol production utilizes sugarcane and molasses for its feedstock. The Sugar Regulatory Administration (SRA) uses a 65 liter/metric ton (Li/MT) conversion rate in the Ethanol PSD Table with a sugarcane co-product (bagasse) recovery rate of 300 kilos (kg) per ton cane. The country is a major sugarcane producer, which is most abundant bioethanol feedstock in the Philippines. Roughly 420,000 hectares are planted with sugarcane. In 2011, sugarcane production reached a record 2.4 million tons. There are an estimated 29 sugarmills with an aggregate milling capacity of 185,000 tons of cane per day. In addition, the local sugar industry has 14 sugar refineries with a total daily capacity of 8,000 tons. The SRA of the Philippine Department of Agriculture is mandated to secure both the production of sugar and feedstock for ethanol under the Biofuels Act.

Following is the combined production history of the accredited ethanol producers, according to the NBP 2013-2030, and are the basis for the production numbers in the Ethanol Table. Since 2007, or when the Biofuels Act was signed, local production has reached a cumulative total of 54 million liters only. Local ethanol production has consistently been below the required volumes needed to meet the mandated ethanol blends.

Actual Bioethanol Production, 2007-2012	
Year	Local Production (in Million Liters)
2007	0.0
2008	0.97
2009	23.28
2010	10.17
2011	4.14
2012*	15.74
TOTAL	**54.30**

*Preliminary data

Source: National Biofuels Plan 2013-2030

Ethanol output in 2011 declined considerably as a result of the DOE's suspension of the implementation of the 10% blend for 6 months. Originally scheduled in February 2011, the E10 blend was suspended to give local gas stations time to make appropriate distribution and logistical adjustments.

Philippine ethanol production is expected to increase through 2015, although analysts predict output will still fall short of demand requirements mainly due to inadequate competitiveness, investments, and plant/refinery capacity. According to industry contacts it takes at least 18 months to build an ethanol plant and the next plant expected to operate commercially is expected to open in by 2014. It reportedly will have an annual capacity of 30 Ml. Two more plants with a combined capacity of 79 Ml are expected to be operational by 2015. Aggregate capacity of the 7 operating refineries in 2015, however, is estimated at 242 Ml, or roughly 65% of demand (refer to CONSUMPTION Section). As a result, significant ethanol imports are expected through at least 2015.

Beyond 2015, the NBP calls for construction of 26 ethanol facilities, each with a capacity of 30 Ml, to satisfy the ethanol requirements (i.e. 1,024 Ml) through 2030. The schedule for plant construction is provided in the following table.

Indicative Bioethanol Plant Capacity Addition at 30 Million Liters per Annum per Plant		
Year	No. of Bioethanol Plants Required	Combined Annual Production Capacity (in Million Liters)
2016	5	150
2019	1	30
2020	15	450
2021	1	30
2023	1	30
2024	1	30
2027	1	30
2029	1	30
TOTAL	**26**	**780**

Source: National Biofuels Plan 2013-2030

Analysts report that for this ambitious target to be met, significant structural changes are necessary in order to make investments in ethanol plant construction attractive. Competitiveness of the local sugarcane industry due to low productivity is the greatest challenge. Although a major sugarcane producer, the Philippines has one of the lowest average sugarcane yields in Asia. Industry sources report that in April 2013 a metric ton of sugarcane sold for about P2,200 ($55/ton at $1=P40) ex-farm. In comparison, Thai farmers received 1,154 baht/ton ($34/MT) in 2012. High production costs are

compounded by further trade liberalization under existing free trade agreements (see Ethanol, TRADE Section).

Consumption, Ethanol

Currently, an estimated 90% of all local gasoline sold are E10, and use ethanol as its octane booster, according to industry contacts. Tightness in available ethanol supply and inadequate distribution infrastructure constrain full implementation of the E10 blend. The local petroleum industry is deregulated, and gasoline and diesel prices vary. According to industry contacts, most local fuel companies use the Means of Platts Singapore as the benchmark in their pricing policy.

In 2012, according to data from the Philippine Land Transportation Office (LTO), there were roughly 7.5 million registered motor vehicles (MVs) in the Philippines. With an estimated population of 100 million in 2012, there would be around 7-8 vehicles for every 100 Filipinos. Since 2010, the number of registered MVs has increased by an average 6.1%, according to LTO data. The number of registered MVs is likely to continue increasing as a result of rising incomes and low interest rates. For the first 3 months of 2013, MV sales reached over 40,000 units as more optimistic consumers fueled demand, according to a press article. MV sales are expected to reach 210,000 units for the entire 2013. (Although the LTO data does not break down MVs into vehicle-type, the number of registered motorcycles/tricycles has visibly been increasing in recent years due to its affordability and practicality given the worsening traffic situation in major urban centers).

There have been no reported problems associated with motor engines running on biofuels. Major car brands in the Philippines with engines made from 1996 onwards can run on biofuels without any issues, according to industry contacts. Motorcycle engines also appear to have no problem, as evidenced by increasing sales. In 2009, the DOE's Renewable Energy Management Board (DOE-REMB) assured the public it would act on formal complaints (should engine trouble arise) from the use of biofuels. To date, it has yet to receive a single valid complaint, according to the same contact.

Fuel ethanol consumption has been increasing consistently since 2007. Following is ethanol supply-demand table that summarizes the 5-year history of ethanol production, importation and consumption.

Bioethanol Supply-Demand (in Million Liters), 2007-2012					
Year	Blend	Local Production	Importation	Total Supply	Domestic Consumption
2007	-	0	3.18	3.18	3.18
2008	-	0.97	12.56	13.53	13.53
2009	5%	23.28	64.24	87.52	87.52
2010	5%	10.17	140.40	150.57	150.57
2011	10%	4.14	215.00	219.94	219.94
2012*	10%	15.74	248.40	264.14	264.14
TOTAL		**54.3**	**683.78**	**741.86**	**741.86**

*Preliminary

Source: National Biofuels Plan 2013-2030 and Post's estimates

Trade, Ethanol

Mainly due to inadequate local ethanol production, ethanol imports have consistently been growing since 2007. Countries that are covered by regional FTAs with the Philippines have dominated ethanol imports in recent years.

Following is the ethanol supply and demand outlook for 2013 through 2030 per the NBP 2013-2030 with the required import volumes for designated timelines. The values are preliminary and minor variances between supply requirements and fuel displacement exist. How gasoline demand and import volumes were derived is unclear. More revisions are still expected.

Bioethanol Supply-Demand Outlook (in Million Liters) 2013-2030					
Year	Gasoline Demand	Bioethanol Blends (Targets)	Supply Requirements	Required Volume for Importation	Fuel Displacement
2013	3813.18	10%	381.36	248.36	381.36
2014	3839.31	10%	383.92	250.92	383.93
2015	3818.61	10%	381.84	169.44	381.86
2020	4328.87	10%	873.00	-	865.70
2025	4712.28	20%	936.00	-	942.45
2030	5084.05	20%/85%	1024.00	-	1016.80

Source: National Biofuels Plan 2013-2030

Post uses the following preliminary import estimates from the Philippine DOE (as reported by the SRA) in the Fuel Ethanol PSD Table. Ethanol falls under 2207.20.11 or Ethyl Alcohol Strength by Volume of Exceeding 99%, according to the Philippine Tariff Commission (PTC). However, there are no entries under 2207.20.11 in the Global Trade Atlas (GTA).

The majority of ethanol imports in 2012 were brought in through Subic Freeport, a Special Economic Zone of the Philippine Economic Zone Authority (PEZA). There are 2 ethanol companies registered with PEZA and as such, enjoy special incentives that include tax holidays and credits. The countries of origin of the ethanol imports, however, are not specified. In 2012, ethanol imports from Thailand dominated overall imports and dramatically increased (89%) to 90 Ml, from the 24 Ml import level in 2011. The huge drop in U.S. ethanol exports to the Philippines is attributed to the AFTA.

Ethanol Imports (Million Liters), 2011-12			
Country of Origin	2011	2012	% Change
Singapore	17.8	23.0	29
Philippines (Subic)	67.3	93.0	38
Indonesia	3.2	-	
USA	56.1	6.9	-88
Vietnam	9.8	6.2	-37
Korea	36.3	3.5	-90
Australia	-	27.1	
Thailand	24.4	88.8	264
TOTAL	**215.0**	**248.4**	**16**

Source: Philippine Department of Energy as provided by the Sugar Regulatory Administration

Executive Order No. 61 signed October 2011 modified MFN tariffs for various products. Ethanol tariffs were left unchanged at 10%, and will remain at this level through 2015. However, if certified by the DOE that the imported ethanol will be used for the DOE's Fuel Ethanol Program (i.e. fuel-blending purposes), an additional a 1% tariff will be imposed. However, under the AFTA, the tariff will drop to 5%.

For sugar, MFN tariffs are currently at 50% through 2015. Under the AFTA, sugar duties are currently

at 18%, to go down to 10% in 2014 before declining to 5% in 2015. The decreasing tariff schedule is a deterrent to investments, and a major concern of the local sugarcane industry.

Ending Stocks, Ethanol

No ending fuel ethanol stocks are expected through 2014.

IV. Biodiesel

Biodiesel (Million Liters)									
Calendar Year	2006	2007	2008	2009	2010	2011	2012	2013	2014
Beginning Stocks	0	0	0	1	7	6	16	29	29
Production	3	49	66	137	124	133	138	190	390
Imports	0	0	0	0	0	0	0	0	0
Exports	0	0	0	0	0	0	0	0	0
Consumption	3	49	64	131	125	123	125	190	375
Ending Stocks	0	0	1	7	6	16	29	29	44
Production Capacity									
Number of Biorefineries	8	8	8	10	8	9	9	9	9
Nameplate Capacity	350	350	350	436	350	393	393	393	393
Capacity Use (%)	0.9%	14.0%	18.8%	31.3%	35.3%	33.9%	35.1%	48.4%	99.3%
Feedstock Use (1,000 MT)									
Feedstock A	3	49	66	137	124	133	138	190	390
Feedstock B	0	0	0	0	0	0	0	0	0
Feedstock C	0	0	0	0	0	0	0	0	0
Feedstock D	0	0	0	0	0	0	0	0	0
Market Penetration (Million Liters)									
Biodiesel, on-road use	3	49	64	130	123	123	125	185	350
Diesel, on-road use	5832	5924	6017	6109	6202	6295	6388	6480	6,573
Blend Rate (%)	0.1%	0.8%	1.1%	2.1%	2.0%	2.0%	2.0%	2.9%	5.3%
Diesel, total use	7,382	7,499	7,616	7,733	7,850	7,969	8,086	8,203	8,320

Production, Biodiesel

As the world's second largest coconut producer, coconut is the most abundant feedstock for biodiesel in the Philippines. Based on PCA data, an estimated quarter of the 13.7 million hectares of farmland in the country is planted with coconut. Out of the 79 provinces which comprise the Philippines, 68 produce coconuts. There are over 340 million nut-bearing trees in the Philippines.

The Philippines is the world's top coconut oil producer and exporter. There are an estimated 50 active CNO mills in the Philippines, according to industry contacts. Of this number, around 20 operate and cater to the export market and roughly 30 concentrate in servicing domestic CNO needs.

Coconut methyl ester (CME) is the main Philippine biodiesel feedstock, and is an oleochemical derived from coconut oil (CNO). CNO is derived from copra, the dried meat of the coconut. Copra meal and glycerine are by-products of the CNO extraction process. Oleochemicals are used in the manufacture of soaps, detergents and other cosmetic items and toiletries. The following copra: CNO: CME conversion is used in this report based on the Coconut Industry Development Roadmap (2011-2016) of the Philippine Coconut Authority (PCA).

1 kg. copra = 0.63 kg. CNO
1kg. CNO =1 liter CME

According to the NBP 2013-2030, there are 11 biodiesel refineries registered with the Philippine Board of Investments. However, only 9 CME biodiesel producers are operating with an aggregate annual capacity of approximately 393 Ml. The following table provides outlines CME output for 2007-2012, and is the basis for the production numbers in the Biodiesel PSD. A 1% blend mix is estimated to require roughly 70,000 Ml of biodiesel. Since the approval and implementation of the Biofuels Law in 2007, CME production has been adequate to meet blend-requirements, and consistently been below aggregate capacity. The NBB has plans to raise the mandated blend rate to 5% sometime in 2013.

Actual CME Production, 2007-2012 (in Million Liters)	
Year	Actual Production
2007	49.10
2008	65.67
2009	136.52
2010	123.55
2011	132.99
2012*	125.00
TOTAL	**572.99**

*Preliminary

Source: National Biofuels Plan 2013-2030

Even before RA9367 was implemented in 2007, the GPH had required the use of CME-blended diesel by all GPH vehicles as a preparatory move prior to its implementation. The 2006 production (and consumption) figures in the PSD are Posts' estimates and reflect the biodiesel used during this preparatory stage.

There have been no major issues in complying with the mandated biodiesel blend using locally produced CME since the implementation of RA 9367, and the PCA continues to be optimistic on the industry's capability to supply the copra required to make CNO (for CME production) when the current blend requirement of 2% is raised.

Indicative Biodiesel Plant Capacity Addition at 44 Million Liters per Annum per Plant		
Year	No. of Bioethanol Plants Required	Combined Annual Production Capacity (in Million Liters)
2020	10	440
2023	1	44
2025	20	880
2027	1	44
2030	1	44
TOTAL	**33**	**1452**

Source: National Biofuels Plan 2013-2030

Consumption, Biodiesel

The GPH had required the use of CME-blended diesel by all GPH vehicles as a preparatory move prior to the implementation of RA9367. The small volume of CME consumed during this trial (estimated at 3 Ml) is reflected in the 2006 column in the Biodiesel PSD.

RA 9367 mandated the use of a minimum 1% biodiesel blend in all diesel fuels by February 2007, to

increase to a 2% blend by 2009. Since 2007, there have been no compliance-related issues with using CME as the preferred biodiesel feedstock. Following is the historical biodiesel consumption at the initial blend rates of one and 2% per the NBP 2013-2030.

Biodiesel Demand (in Million Liters), 2007-2012		
Year	Biodiesel Blend (in Accordance with RA 9367)	Actual Domestic Consumption
2007	1%	48.48
2008	1%	64.48
2009	2%	130.93
2010	2%	124.51
2011	2%	122.97
2012*	2%	67.02
TOTAL		**558.39**

*Preliminary

Source: National Biofuels Plan 2013-2030

The improving economy and the increasing number of Philippine MVs are expected to result in increasing diesel demand through 2030. The following table outlines projected biodiesel demand given specific blends and their corresponding biodiesel requirements through 2030.

Biodiesel Supply-Demand Outlook (in Million Liters) 2013-2030				
Year	Diesel Demand	Biodiesel Blends (Targets)	Supply Requirements	Fuel Displacement
2013	7095.18	5%	392.60	354.76
2014	7214.23	5%	392.60	360.71
2015	7382.23	5%	392.60	369.11
2020	7968.81	10%	840.88	796.88
2025	8746.34	20%	1770.00	1749.27
2030	9087.52	20%	1858.00	1817.50

Source: National Biofuels Plan 2013-2030 and Post's estimates (2013 & 2014 fuel displacement)

The NBP 2013-2030 assumes a 5% blend mandate in 2013, increasing to 10% in 2010, and 20% by 2030. The considerable increase in 2013 production and consumption figures in the Biodiesel PSD Table is premised on the adoption and implementation of a 5% mandated blend in the fourth quarter of this year. At a 5% blend level, production output will likely approximate the current capacity of existing CME plants in 2014.

Trade, Biodiesel

Net energy imports in 2010 accounted for 42.5% of the total energy supply, reaching 17.3 MTOE or 8.5% higher than the 2009 level of 16.0 MTOE, according to the PEP 2011-2030. Comprising net imported energy in 2010 are 79.1% oil and oil products; 20.3% coal; and, 0.6% biofuels.

According to EO 61, CME is classified under the tariff heading 3824.90.90B. There are no records in the GTA under this heading, however. There are also no records under 2710.20. It is unlikely that any importation of CME for fuel use was, or will be made during the timelines specified in the Biodiesel PSD, since there is no provision for biodiesel importation in the Biofuels Act.

Most items under the grouping of 2710 and 3824.90.90 are levied a 3% MFN tariff through 2015 but may be imported duty-free if coming from ASEAN-member countries through 2015 under the AFTA.

Copra (12.03) imports, on the other hand, are subject to a 10% MFN duty for the period 2011-2015. Theses imports are duty-free under the AFTA.

Ending Stocks, Biodiesel

Biodiesel stocks increased considerably in 2012 as the local industry anticipated and prepared for the shift to a higher 5% blend (but did not materialize). Stocks are likely to increase further in 2014 due to the expected implementation of the higher blend-mandate.

V. Statistical Information

- Gasoline and diesel numbers in the Fuel Use Projections for the years 2015 and 2020 were based on estimates provided in the Bioethanol and Biodiesel Supply-Demand Outlook Tables in the Consumption Section.
- The difference between 2015 and 2020 diesel and gasoline demand estimates was obtained, and divided by 5 to arrive at annual increments for gasoline and diesel (102 Ml and 117 Ml, respectively). These increments were used to compute for diesel and gasoline demand estimates for years 2016 to 2019, and 2021 to 2023.
- On-road diesel use was obtained by multiplying total diesel use by 78.6% (which approximates the energy consumption of road transport use road in the PEP 2011-2030).
- The sum of gasoline and diesel use estimates was divided by 62% (the demand percentage share of gasoline and diesel in the total petroleum products demand, PEP 2011-2030) to arrive at total fuel use.
- Jet Fuel values were derived by multiplying total fuel use by 9.7%, or the percentage of kerosene/Avturbo in the total petroleum products demand, PEP 2011-2030.