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Report Highlights:

To combat the spread of the COVID-19 pandemic, the Philippine government placed much of the country in various forms of quarantine, which in turn sharply eroded the demand for both the ethanol-gasoline and on-road biodiesel-diesel fuel pools in 2020. Year-over-year, the former is projected to drop 16 percent, while the later falls 21 percent. A positive development for both biofuel markets, the blend rates for ethanol are expected to hold largely unchanged year-over-year. Post expects 2020 fuel ethanol imports, essentially all from the United States, to decline 12 percent to 225 million liters, which is in line with lower domestic consumption. Actual blending achieved continues to fall short of the original mandate schedules.

Executive Summary:

Philippine fuel ethanol and biodiesel blends (10 and 2 percent, respectively) are mandated by the Biofuels Act of 2006 or [RA 9367](#) and Department Circulars from the Department of Energy (DOE) that set current blend mandates for [fuel ethanol](#) and [biodiesel](#). Starting with the [Philippine Energy Plan \(PEP\) 2012-2030](#), the Philippine government's (GPH) target was to raise the biofuels mandated blends to E20 and B10 by 2020. However, inadequate investments in new biofuel plants and distribution infrastructure, inadequate tax policy, and no other support programs for biofuels have forced the GPH to review its plans and targets. This is embodied in the [2018-2040 PEP](#), which recently was approved after public review by energy stakeholders. As with the 2017-2040 PEP, the updated plan recommends maintaining the current blend mandates, i.e., E10 and B2 and revisiting biofuels blends and feedstock availability (while continuing biofuels feedstock research and development programs) in the medium- to long-term.

Fuel ethanol demand is a function of the mandated blend which fell below target after 2014 and stagnated. A growing fuel pool has permitted some further rise in volume use over the last decade, but that increase slowed considerably after 2014 until COVID-19 significantly lowered fuel demand in 2020 and forced a year-over-year drop. Imports, which initially dominated ethanol supply through 2015, have since covered close to half of total domestic use as local production increased consistently since 2012. Although Section 5.2 of the Biofuels Act allows ethanol imports only up to four years after the 2009 blend implementation (up to 2013), inadequate local production has required continued importation. The quota allocation scheme of locally produced ethanol, domestic feedstock (molasses from sugar cane) limitation for local fuel ethanol production, and efforts to maintain E10, which have fallen somewhat, combine to make the Philippines one of the most open economies for fuel ethanol imports. The Philippines also imports about 50 million liters/year of nonfuel-grade ethanol presumably mostly used as other industrial chemicals and not for beverage use. The Philippines exports virtually no ethanol as it is a high-cost producer with effectively no exportable supply.

Biodiesel imports are prohibited and exports are minor due to tight supplies. Biodiesel consumption is met entirely by local production, which has consistently met and slightly exceeded the 2 percent blend (B2) since 2009. Not implemented was a B5 blend in 2015 due to high coconut oil (CNO) prices and therefore, the higher cost of biodiesel-blended diesel at the pump without subsidy support. In 2020, advocates in the Philippine government and the biofuels industry continued the push for an increased biodiesel blend mandate as set by the PEP, but the COVID pandemic has delayed any possible discussions on changes to current practice. The robust growth in international demand for CNO plus the low efficiency of the domestic coconut industry, coupled with the inability to import has resulted in limited biodiesel expansion.

The COVID-19 pandemic has deeply affected the Philippine economy, the movement of people, and fuel demand. Starting in mid-March, the government placed the national capital and many parts of the country into a form of community quarantine, with people permitted outside the home for only essential activities. The quarantine levels have eased in the following months, although vehicle use remains much lower than normal. Post expects a decline in the Philippines' ethanol-gasoline and on-road biodiesel-diesel pools of 16 and 21 percent from 2019 to 2020, respectively. Renewable fuel blend rates in both are expected to hold nearly steady, however, resulting in drops in fuel ethanol and biodiesel of similar magnitudes.

II. Policy and Programs

Signed in January 2007, the Biofuels Act or Republic Act ([RA 9367](#)) made the Philippines the first country in Southeast Asia to have biofuels legislation in place. Molasses from sugarcane is now primarily used in Philippine ethanol production, whereas the industry initially used mostly cane juice. The feedstock for biodiesel is coconut oil (CNO). The current official blend mandates are 10 percent (E10) and 2 percent (B2) for fuel ethanol and biodiesel, respectively. This target blend rate was first achieved for ethanol in 2014, but there has been difficulty fully meeting it since. The actual rate for biodiesel has remained consistently at two percent over the last decade. The Biofuels Act gives priority to local ethanol over imports, but the mandated blend historically has largely been met through imports. Biodiesel imports are not allowed under the Biofuels Act.

RA 9367 seeks to develop indigenous renewable energy (RE) to reduce dependence on imported oil; mitigate greenhouse gas emissions; increase rural employment; and ensure the availability of RE without detriment to the environment and food security. Implemented in June 2007, RA 9367 provides fiscal incentives to biofuels producers and distributors including income tax holidays, duty-free importation, value added tax (VAT) exemptions, among others. Unlike in the United States where the Environmental Protection Agency has a significant role in biofuels policy, the Philippine Department of Environment and Natural Resources (DENR) has no such involvement provided by RA 9367. Meanwhile, the DOE must ensure that fuel quality standards and guidelines for biofuels (as well as biofuel-blended gasoline and diesel) are compliant with Philippine National Standards. In addition, the Biofuels Act provides that water effluents used in production shall conform to the Philippine Clean Water Act, subject to the monitoring and evaluation of the DENR.

RA 9367 created the National Biofuels Board (NBB), a cabinet-level body that ensures biofuel policy is consistent with the goal of balanced economic growth. The NBB is tasked with reviewing and recommending to DOE any changes to the biofuels blend mandates. The following table shows the fuel ethanol blend targets and implementation dates since inception. The actual blend mandate as established by DOE, however, has remained at 10 percent despite the target of E20 by 2020 as noted in the Philippine Energy Plan (PEP).

ETHANOL TARGETS	Blend
Year	%
2009	5
2011	10
2015	10
2020	20
2025	20/85*
2030	20/85*

*aspirational & voluntary goal
Source: DOE

For biodiesel, RA 9367 mandated the use of a minimum one percent biodiesel blend in all diesel fuels (off-road and on-road) by February 2007, to increase to a two percent blend by 2009. Following are DOE's biodiesel blends targets through 2030:

BIODIESEL TARGETS	BLENDS
Year	%
2007	1
2009	2
2015	5
2020	10
2025	20
2030	20

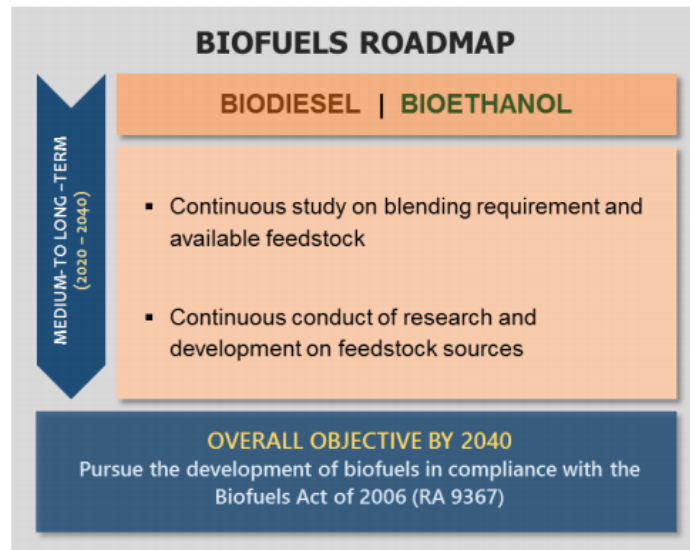
Source: DOE

As noted in the [Implementing Rules and Regulations of RA 9367](#), the NBB may only lower the biofuel blends within the first four years of implementation. (i.e., until 2011) Hence, the five and two percent blend mandates for ethanol and biodiesel, respectively, cannot be decreased thereafter.

As an aspirational goal, the DOE wants to make available an 85 percent ethanol blend for voluntary promotion by 2025. Attaining this goal is unlikely and is manifest in the 2020-2040's biofuels roadmap below, which is included in the DOE's PEP. Not specified in the roadmap are concrete measures for moving beyond the current fuel ethanol and biodiesel blends of E10 and B2. The PEP is the basis of the country's biofuels strategy expressed in the National Biofuels Plan (NBP). The PEP and the NBP are 'living documents' and regularly reviewed and adjusted.

The DOE recently finalized the PEP for 2018-2040 after [receiving public comments](#) in August, 2020. The revised [PEP](#) calls for the DOE, NBB, and other stakeholders to revisit the blend mandates and to pursue additional research, including on the economic impacts of increased blending.

Figure 52. BIOFUELS ROADMAP (2020-2040)



Source: [PEP 2018-2040, Chapter V – Renewable Energy](#)

The Renewable Energy (RE) Act or [RA 9513](#) was passed in 2008. The country at the time was the world's second largest producer of geothermal energy and the first country in Southeast Asia

to establish a commercial wind farm and a grid-connected solar photovoltaic power plant. Under RA 9153, a Feed in Tariff (FIT) system is provided for RE providers for a period of 20 years. Each RE technology was given a different allocation and rate over a period of three years.

In February 2017, Philippine President Rodrigo Duterte signed the Paris Agreement on Climate Change. The Philippines has committed to reduce its greenhouse gas emissions by 70 percent by 2030 but needs technical and financial support. By 2040, the GPH aims to have RE installed capacity at 20,000 MW.

A major program of the Duterte administration is a comprehensive tax reform package. The first tranche, the Tax Reform for Acceleration and Inclusion (TRAIN), or [RA 10963](#), was signed on December 27, 2017. TRAIN lowered personal income tax rates while imposing new excise taxes on petroleum products and motor vehicles, among others, starting January 1, 2018.

Local academia, industry, and biofuels stakeholders remain interested in studying the possibility and feasibility of increasing the blend mandate from E10 to E15 and further to E20, and potentially allowing up to E85. Due to challenges arising from COVID-19, such discussions are on hold but are expected to resume once the country's situation improves.

Import Policy Including Duties/Export Taxes and Levies

The DOE rationalizes the distribution of locally produced ethanol by determining the volume of production and allocating this quantity to local oil companies on a monthly basis. Oil companies are required to purchase the entire monthly allocation before they can import ethanol. The quota allocation system for locally produced ethanol ensures that imports do not displace locally produced ethanol. Although Section 5.2 of the Biofuels Act allows ethanol imports only up to four years after the 2009 blend implementation or 2013, inadequate local production has necessitated continued importation. The quota allocation scheme, domestic feedstock limitation for local fuel ethanol production, and efforts to maintain E10 combine to make the Philippines one of the most open economies for ethanol imports.

Fuel ethanol tariffs (2207.10 and 2207.20) under various free trade agreements within ASEAN, including the Philippines, fell to zero in 2016 and remain duty free. Likewise, Most Favored Nation (MFN) tariffs for World Trade Organization (WTO) member countries remain at zero percent in 2020. A duty of one percent is imposed if the ethanol is used for fuel-blending purposes under the Philippine Fuel Ethanol Program, according to the DOE.

Biodiesel imports above B30 to B100 (HS 382600) are levied a three percent MFN tariff while petroleum oils containing B1 to B30 (HS 271020) are duty-free. Biodiesel imports, however, remain prohibited under the Biofuels Act.

COVID-19 policy impacts

Months into the pandemic and strict community quarantine limiting fuel demand, Philippine oil companies called for a suspension of the E10 blend mandate. They argued that ethanol refineries should shift production to ethyl alcohol to increase the country's supplies of hand sanitizers. The Philippine Food and Drug Administration issued interim guidelines for provisional licenses to

operate and certificates of product notification for all ethanol and isoproponal (petroleum-based) products via [FDA Memorandum Circular 2020-001](#).

Although no changes to the Biofuels Act were made, over 1.5 million liters (most recent data January-June 2020) of 70/95 percent alcohol were produced by Ethanol Producers Association of the Philippines (EPAP) members and donated to local government units, offices, and schools.

On May 2, 2020, President Duterte issued [Executive Order No. 113, s2020](#) raising the tariff rate on imported crude oil and petroleum products by an additional ten percent. Citing the need to augment government revenues to combat the COVID-19 pandemic, the increased duty is to stay in place for six months or until international oil prices increase to certain trigger levels. Imported ethanol is not assessed the higher duty, but imported gasoline blended with ethanol is charged the additional ten percent.

III. Gasoline and Diesel

Fuel Use (Million Liters)										
Calendar Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 ^f
Gasoline Pool	3,865	4,098	4,358	4,505	5,174	5,692	6,199	6,383	6,907	5,750
Diesel Pool	6,696	7,004	7,394	7,778	8,793	9,535	10,159	10,158	10,516	8,623
On-road	5,566	5,819	6,187	6,579	7,334	7,701	8,086	8,200	8,413	6,646
Jet Fuel Pool	380	454	536	673	551	737	630	724	777	497
Fuel Pools Total	10,941	11,556	12,288	12,956	14,518	15,964	16,988	17,265	18,200	14,870

^f = forecast; fuel pools include biocomponents
Source: DOE, with Post estimates for 2020

The local industry is deregulated, with gasoline and diesel prices varying by company and area. Diesel is the primary transport fuel used in the Philippines and has a price advantage over gasoline. Although environmental consciousness is growing, price considerations remain the dominant factor in motor vehicle sales and fuel use in the Philippines.

Local gasoline stations generally offer regular, mid-grade, and premium or high-octane gasoline. These have octane ratings of 91, 95, and 97-octane or higher, respectively. Low to mid octane gasoline engines dominate Philippine gasoline-powered vehicles. The growth rates for both ethanol-gasoline and biodiesel-diesel pools have remained unusually high compared to most countries and is expected to continue given little progress on other initiatives to shift demand toward public transport or to natural gas or electricity for public or private transport.

Flexi-fuel

Post estimates that the number of flexi-fuel vehicles (capable of using E85) is insignificant. In 2007, Ford Motor Company Philippines, Inc. (FMCPI) opened a new P4 billion (\$74 million) assembly plant in Santa Rosa, Laguna which manufactured and subsequently sold FFVs to the market. In 2012, FMCPI announced the cessation of its operations citing "lack of supply base and economies of scale." On March 2014, Mitsubishi Motors Philippines Corporation (MMPC) acquired the assembly plant, but opted not to produce FFVs from this location. Moreover, in

February 2020 Honda Cars Philippines, Inc. decided to close its own car manufacturing operations (non-FFV) in Santa Rosa, Laguna due to low sales.

Public Utility Vehicles (PUVs)

The Philippine Congress has [defined](#) the PUV as “a motor vehicle considered as a public transport conveyance or common carrier duly registered with the Land Transportation Office and granted a franchise by the Land Transportation Franchising and Regulatory Board.” Many forms of PUVs operate in the Philippines, including buses, taxis, and the ubiquitous jeepneys, which can seat about twelve people. The following details various developments in the PUV sector:

Compressed Natural Gas (CNG)

In 2004, [Executive Order No. \(EO\) 290](#) entitled “*Implementing the Natural Gas Vehicle Program for Public Transport*” initiated the pilot testing of locally sourced natural gas as fuel for 200 public utility buses using compressed natural gas (CNG) from the Malampaya gas field (located 65 kilometers northwest of the island of Palawan). While the test proved it was technically feasible to use CNG for public utility buses, the establishment of CNG depots was a major economic challenge due to the absence of supply pipelines. Likewise, while Malampaya provides virtually all the country’s natural gas requirements, supply is projected to be short of demand starting 2022. The DOE had estimated a market potential of 16,000 public units of utility buses shifting to CNG.

Liquefied Petroleum Gas (LPG)

In 2010, an estimated 17,500 taxi units were running on liquefied petroleum gas (LPG). The availability of new car models (for taxis), low gasoline prices (in 2014-2015) and the negative health perception, however, dampened the interest of fleet operators to convert to LPG. The numbers have been declining, as a result. From 17,500 in 2010, LPG taxis declined to 9,718 units in 2015, dropping further to 8,415 units in 2016. The number of refilling stations also declined, from 218 stations in 2014 to 192 stations in 2015-2016, according to the DOE. Despite this, the DOE asserts that LPG vehicles will form part of the public transport sector being promoted by the department, along with electric and other natural gas-fueled vehicles.

Electric Vehicles

Unconfirmed estimates place the number of electric vehicles (EVs) in the Philippines at 2,000 units. In 2006, EO 488 was issued to support the manufacturing of EVs by reducing tariffs for EV components. Although EVs, mostly PUVs, can be seen on some roads in major urban centers, charging stations are grossly inadequate. The first oil company had its EV charging facility installed only in late 2017. Based on data from the Finance Department in 2017 there were nine EV manufacturers but only three availed of the fiscal incentives. Industry forecasts EVs to comprise 10 percent of the total 200,000 PUVs over the next five years, but this is not expected to happen under the present policy environment.

Although EVs are already exempt from the TRAIN excise taxes (mentioned in the Policy section), there are ongoing efforts in the Philippine Senate to consolidate several bills filed to accelerate the development of the e-vehicle industry. All the bills provide fiscal incentives to EV (and other green vehicles) producers such as the removal of import duties and other fiscal perks. The DOE has been supportive and has proposed additional non-fiscal incentives such as free

charging and parking, as well as exemption from number coding and other traffic management schemes.

Public Utility Vehicle Modernization Program

On June 19, 2017, the Philippine Department of Transportation (DOTR) officially launched the country's Public Utility Vehicle (PUV) Modernization Program. Involved is the phase out of PUVs, including jeepneys or PUJs (i.e., jeeps used as public utility vehicles), aged 15 years and older, to be replaced with more environment-friendly vehicles with more efficient engines (i.e., Euro-4 compliant or electrically powered) by 2020. There are an estimated 220,000 jeepney units operating throughout the country. The PUV Modernization Program also aims to consolidate the number of operators, franchises, vehicles with the end result being larger passenger capacity and higher fuel efficiency PUVs operating at reduced GHG emissions. Electric PUVs could be part of the program, but are not required in the current phase-out.

The Land Bank of the Philippines estimates that each jeepney replacement will cost around P1.4 million (\$27,500) to ₱1.6 million (\$31,400). The actual cost of a jeepney, however, may reach P2.1 million or \$41,200 (based on an interest rate of 6 percent per annum and a payment period of 7 years). Some transport groups have criticized the program as "anti-poor" and have strongly opposed the program. The PUV modernization plan is about two years behind schedule, according to a media article, and the DOTR has stated it will continue to implement the program despite the pandemic and criticism from some groups.

In 2020 the Congressional Policy and Budget Research Department of the House of Representatives issued a policy brief titled "[Looking into the Implementation of Public Utility Vehicle Modernization Program](#)." It concluded that the program has focused too much on vehicle replacement and that the adequate level of financial support has yet to be determined to incentivize operators to make the necessary investments.

COVID-19 Effects

Responding to the COVID-19 pandemic, President Rodrigo Duterte on March 16, 2020 placed the island of Luzon under "enhanced community quarantine," effectively imposing lockdown conditions. The order restricted the movement of people (with some exceptions) and suspended mass transportation. The Luzon quarantine included the setting up of checkpoints, banning of public events, closure of commercial businesses, schools and universities, among others. Private establishments involved in food processing, preparation, and distribution plus others providing basic necessities could remain open but only with a skeletal workforce. In the following months, the quarantine restrictions were reduced, including the resumption of private shuttles and transport network vehicle services on June 1, 2020. Jeepneys, a major form of public transportation, were gradually allowed to operate, although with new health requirements that limited seating. Finally, on October 9, 2020 the Inter-Agency Task Force on the Management of Emerging Infectious Diseases eased the movement restrictions across areas of differing quarantine levels.

The months of business and school closures and movement restrictions had a significant impact on fuel demand; Post estimates that overall fuel consumption in 2020 will drop 18 percent compared to 2019. On-road fuel use, both ethanol-gasoline use and biodiesel-diesel use, are

expected to decline by over twenty percent due to the significant restrictions on transportation. Off-road fuel usage from sectors such as agriculture, manufacturing, and other industries were deemed essential and permitted to operate throughout the pandemic. It is expected, for the most part, that year-over-year biofuel blending levels will remain unchanged in 2020, so annual percentage declines for biofuel use will track the overall expected decreases in the fuel pools.

IV. Ethanol

Ethanol Used as Fuel and Other Industrial Chemicals (Million Liters)										
Calendar Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020f
Beginning Stocks										
Fuel Begin Stocks	0	0	0	0	0	0	0	0	0	0
Production										
Fuel Production	4	35	72	115	168	230	235	296	346	275
Imports										
Fuel Imports	215	248	297	339	311	260	276	285	257	225
Exports										
Fuel Exports	0	0	0	0	0	0	0	0	0	0
Consumption										
Fuel Consumption	219	283	369	454	479	490	511	581	603	500
Ending Stocks										
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
Refineries Producing Fuel Ethanol (Million Liters)										
Number of Refineries	3	4	4	8	8	10	10	12	12	12
Nameplate Capacity	79	133	133	222	222	282	282	380	380	380
Capacity Use (%)	5.1%	26.3%	54.1%	51.8%	75.7%	81.6%	83.3%	77.9%	91.1%	72.4%
Co-product Production (1,000 MT)										
Bagasse	0	144	150	150	45	17	12	3	88	30
Feedstock Use for Fuel Ethanol (1,000 MT)										
Sugar Cane	0	480	500	500	150	55	40	10	294	100
Molasses	16	20	155	340	650	930	950	1,200	1,340	1,100
Sugar	0	2	10	5	0	0	0	0	0	0
Market Penetration (Million Liters)										
Fuel Ethanol Use	219	283	369	454	479	490	511	581	603	500
Gasoline Pool	3,865	4,098	4,358	4,505	5,174	5,692	6,199	6,383	6,907	5,750
Blend Rate (%)	5.7%	6.9%	8.5%	10.1%	9.3%	8.6%	8.2%	9.1%	8.7%	8.7%

f = forecast

Source: DOE and SRA, with Post estimates for 2020

Consumption

Fuel ethanol demand is a function of the mandated blend and fuel pool size. Volume use has risen over the last decade but slowed considerably after 2014 with no further blend increases – and in fact some decline – supported only by growth in the ethanol-gasoline fuel pool. Blend enforcement remain concerns mainly due to the archipelagic and geographical terrain of the Philippines. The distribution infrastructure is inadequate and is a challenge to inefficient feedstock production and milling operations. As a result, high prices characterize vital links in the domestic ethanol production-distribution system.

Greatly reduced fuel demand owing to movement restrictions to control the spread of COVID-19 placed strong downward pressure on gasoline prices. However, on May 2, 2020 President Duterte signed [Executive Order No. 113](#), temporarily placing an additional 10 percent value-added tax on imported crude and refined oil to boost government revenue to combat the pandemic.

The following table shows the retail pump price range for the common gasoline grades for October 2, 2019 and October 8, 2020, as well as corresponding ethanol reference price indexes from the previous month. Local gasoline (RON 91, 95, and 97) prices declined over 11 percent from an average of P52.84 (\$1.05) per liter in October 2019 to P46.8 (\$0.93) per liter in October 2020. Local ethanol prices, on the other hand, stayed flat from P58.93 (\$1.17) per liter in October 2019 to P61.45 (\$1.17) per liter in October 2020. Due to gasoline’s drop in price, the pump-price difference of ethanol and gasoline has further widened from negative P6.09 (\$0.12) per liter in 2019 to P11.9 (\$0.24) in 2020.

LOCAL GASOLINE VS. LOCAL ETHANOL PRICES, Manila		
	Price Range (P/Liter)	
Gasoline	Oct. 2, 2019	Oct. 8, 2020
RON 97	49.60-56.25	46.10-51.32
RON 95	50.10-56.55	42.00-50.40
RON 91	49.05-55.47	41.50-49.55
	Average for Sep. 2019	Average for Sep. 2020
Ethanol	58.93	58.70

Source: [DOE](#) and [SRA](#)

Locally produced ethanol remains significantly more expensive than imported ethanol, as Philippine producers face high prices for domestic molasses. The average cost of imported ethanol in August 2020 (most recent data available) was P18.87 (\$0.37), or less than one third the price of local ethanol at 58.93 (\$1.17). Import prices have increased, however, as imported ethanol was around P17 (\$0.33) per liter around the same period in 2019.

Production

Fuel-grade ethanol output in 2020 is projected to decrease 20 percent to 275 million liters from 346 million liters in 2019. This drop mirrors the decline in consumption due to reduced fuel demand from the movement restrictions placed to limit the spread of COVID-19. Year to date production through September is 192.67 million liters, according to preliminary data from SRA. For 2021, production is expected to make a partial recovery as the country reopens, vehicle use increases, and restrictions are loosened. There are currently 12 fuel ethanol plants operating with a combined capacity of 380 ML, which is unchanged since 2018. As reported by the DOE in its [list of accredited bioethanol producers](#), three additional limited capacity ethanol plants are in various stages of development and would add 68 million liters of combined capacity once completed. They are not expected to be finished until at least 2021. Ethanol plants in the Philippines are small in scale by international standards for commercial operations supplying fuel ethanol.

Competitiveness of the local sugarcane industry remains a major challenge. The Philippines has one of the lowest average sugarcane yields in Asia. Post expects total raw sugar production in MY 2020/21 (September/August) to reach 2.2 million metric tons (MMT), up 4.7 percent from the previous year, with cane production expected to be about 23.5 MMT. The industry has switched from sugarcane to a molasses-based industry around 2015. High and increasing sugar prices (and consequently of molasses) is a serious constraint. From Sep. 6, 2020 to Oct. 11, 2020, the average mill site price was P10,536 (\$211) per ton or 13 percent lower than the P12,153 (\$238) per ton from a similar period in 2019.

Close to 80 percent of total molasses in the country is used for ethanol production. A proposal to import molasses to augment local feedstock supply is being studied at the Philippine Senate as local ethanol producers can only import molasses when approved by the SRA. There have been no developments since last year, however, likely due to the challenges of COVID-19.

Trade

Fuel ethanol imports in 2020 are projected to decline 12 percent to 225 million liters from 257 million liters in 2019 due to weakened fuel demand. In recent years the United States has been the predominant ethanol supplier with over 90 percent market share. Year to date import data from DOE and SRA through September 2020 show 97 percent of imports arriving from the United States, amounting to 154 million liters.

Based on U.S. export data, the Philippines remained the sixth largest market for U.S. fuel ethanol in 2019 with U.S. shipments of 250 million liters valued at \$94 million, 17 percent lower in volume and 25 percent lower in value than 2018. U.S. ethanol exports to the Philippines in 2020 through August show an even larger decline (over 30 percent), reflecting the challenging environment facing most foreign markets this year for U.S. biofuels. According to industry contacts, Philippine imports of non-fuel/industrial ethanol were approximately 7.5 million liters in 2019. Trade through September of 2020 has already reached 38.6 million liters and will likely surpass 50 million liters by December. This would equate to an over six-fold increase in industrial ethanol imports from 2019.

Fuel Ethanol Imports (million liters)					
Country of Origin	2016	2017	2018	2019	2020*
Australia	16.60	3.85			
South Korea	1.91	5.69		6	3.99
USA	241.04	263.07	284.59	251.35	154.15
Vietnam		2.96			
Total	259.55	275.56	284.59	257.35	158.14

Source: SRA and DOE

*Through September 2020

HS codes 2207.10 and 2207.20

V. Biodiesel

Biodiesel (Million Liters)										
Calendar Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020f
Beginning Stocks	7	17	18	20	29	32	41	57	68	90
Production	133	138	155	172	204	227	220	220	242	175
Imports	0	0	0	0	0	0	0	0	0	0
Exports	0	0	0	0	0	0	0	4	2	0
Consumption	123	137	153	163	201	218	204	205	218	185
Ending Stocks	17	18	20	29	32	41	57	72	90	80
Balance Check	0	0	0	0	0	0	0	0	0	0
Production Capacity (Million Liters)										
Number of Biorefineries	9	9	9	11	11	11	11	11	12	12
Nameplate Capacity	350	393	393	585	585	575	575	575	608	608
Capacity Use (%)	38.0%	35.1%	39.4%	29.4%	34.9%	39.5%	38.3%	38.3%	39.8%	28.8%
Feedstock Use for Fuel (1,000 MT)										
Coconut Oil	122	127	142	158	187	208	202	202	220	165
Market Penetration (Million Liters)										
Biodiesel, on-road use	123	137	153	163	201	218	204	205	218	185
Diesel, on-road use	5,566	5,819	6,187	6,579	7,334	7,701	8,086	8,200	8,413	6,646
Blend Rate (%)	2.21%	2.35%	2.47%	2.48%	2.74%	2.83%	2.52%	2.50%	2.59%	2.78%
Diesel, total use	6,696	7,004	7,394	7,778	8,793	9,535	10,159	10,158	10,516	8,623

f-forecast; diesel use includes biodiesel

Source: DOE, with Post estimates

Consumption

The DOE forecasts that 2020 biodiesel consumption will decline 15 percent to 185 million liters, from 2019's 218 million liters. The estimate is based on the DOE's Assumption for Impact of COVID19 to Energy Supply and Demand projections as detailed in the PEP 2018-2040. On-road use likewise will decrease by over 18 percent during the same period, as movement restrictions heavily affected transportation. The end result is no significant year-over-year change in biodiesel blending is expected.

CNO prices started to decline in 2018 due to an oversupply in global vegetable oils, remained flat through 2019, and have strengthened in 2020. The weighted traded price of CNO from January-July 2020 increased 7.6 percent from the same period in 2019, reaching \$835/metric ton, according to the PSA as prepared by UCAP Research.

Following are comparative diesel and coconut methyl ester (CME) prices for October 2019 and October 2020. Local diesel pump prices declined over 28 percent from P44.95 (\$0.88) per liter in October 2019 to P32.36 (\$0.65) per liter in October 2020. CME prices vary due to geography and copra seasonality. From 2019 to 2020, however, CME prices remained flat at an average of P52.5 (\$1.05) per liter from 2019 to 2020.

LOCAL DIESEL VS. CME PRICES		
As of Q3 2020		
	Price Range (P/Li)	
	2019	2020
Diesel	44.95	32.36*
CME	35-70 (avg. 52.5)	35-70 (avg. 52.5)**

*Latest data available, October 2020

** Latest data available, September 2020

Source: [DOE](#)

In 2019, there were efforts to implement the stalled biodiesel mandate of 5 percent (B5). A prominent Senator on March 4 urged the Department of Energy and the NBB to study the merits of a proposal to reach B5 and look for next steps to move the industry forward. In a resolution dated July 19, 2019, representatives from various coconut stakeholder groups urged the GPH to immediately implement the B5 blend. The resolution came after a roundtable discussion initiated by the Philippine Coconut Authority (PCA) as part of the agency’s efforts to address low copra prices. Those efforts stalled in 2020 due to the pandemic and the restrictions on movement.

Industry contacts from a major Quick Service Restaurant have noted that there was an attempt to produce biodiesel from used cooking oil. The pilot project found that it was not economical and was not pursued further. Post has not heard of other sources of feedstock being used as an alternative to CME, such as tallow from slaughter houses. Allowing biodiesel imports (while at the same time supporting existing feedstock industry expansions and efficiencies) would require a change in the Biofuels Act, which currently has little support in Congress. All these could augment local CME supply, if short, and be options to meet an increased B5 blend.

Production

An estimated 50 active CNO mills operate in the country, and around 20 cater to the export market while roughly 30 concentrate on servicing domestic CNO needs, according to industry contacts. Virtually all domestic biodiesel is made using CNO, also known as coconut methyl ester (CME), an oleochemical derived from coconut oil. CNO is obtained from crushing copra, the dried kernel/meat from coconuts. Oleochemicals derived from CNO are also used in the manufacture of soaps, detergents, and other cosmetic items and toiletries.

According to the DOE’s [list of accredited biodiesel producers](#), there are 12 registered biodiesel refineries in 2020, with one new plant in Mindanao becoming operational in 2019. The aggregate annual capacity has expanded to 607.9 million liters, up nearly six percent from the previous 575 million liters in 2018. Seven CME producers operate on the island of Luzon, while five are located on Mindanao island. The DOE notes that 12 refineries produced a record 241.5 million liters of CME in 2019, 10 percent higher than the previous year. Through September of this year the Philippines has produced 137.8 million liters; Post projects total production will reach 175 million liters in 2020, or about 28 percent less than 2019.

Hovering around the two percent blend level, capacity utilization increased to nearly 40 percent in 2019 of total aggregate capacity of 608 million liters. Capacity use is expected to decline in 2020 to only 29 percent, however, due to weakened demand across the transportation sector.

The Philippine Statistics Authority's (PSA) [most recent quarterly bulletin](#) shows January-June 2020 coconut (with husk) production at 6.4 million MT, down 3.4 percent from last year's level. Area planted and number of coconut-bearing trees have declined about one percent from 2019 to 2020. Industry notes that two years of increasing nut bearing is usually followed by declining output and that coconut trees are likely on the verge of stress. This 'rest' period should be ending now and reverting to increased production for MY 20/21. Production could also be buoyed by increased precipitation by the expected La Niña in late 2020 and early 2021.

On a long-term basis, copra productivity remains constrained by predominantly old and unproductive coconut palms or trees, which constitute an estimated 20 percent of overall Philippine coconut trees. Coconut trees have a long lifespan (80-90 years) and start to bear nuts after 6-10 years but take around 15-20 years to reach their peak.

Trade

CNO is the country's top agricultural export. Year to date data through July 2020 show CNO exports in 2020 have declined 29 percent to 494,943 MT from 697,570 in 2019, according to PSA data prepared by the United Coconut Association of the Philippines. Per an industry contact, traders have opposed increasing the existing two percent blend to avoid trade disruptions and satisfy longstanding export commitments to their preferred buyers.

There is minimal exportable supply of biodiesel given feedstock limitations, and the Biofuels Act does not permit biodiesel imports. No biodiesel exports are expected through 2021, as a result. However, if imports were permitted, the B5 blended goal for 2015-2019 set in 2007 legislation could be achieved with its associated human health and carbon emission reduction benefits.

VI. Advanced Biofuels

According to a local expert, algal biodiesel would be necessary to augment feedstock supply in order to comply with the higher mandate, assuming imports remain banned. However, commercialization of price competitive algal biodiesel is not foreseen in the near- to medium-term.

On the other hand, there is limited information on current research and development for ethanol made from cellulose, or cellulosic fuel. One company is conducting [contained use/laboratory research](#) on genetically engineered yeast in a pilot trial for boosting cellulosic ethanol production (i.e., bagasse from sugarcane). Also lacking are demonstration plants that could prove the commercial viability of advanced biofuels technology. The development of commercial cellulosic fuel will likely entail a much longer time, closer to 2030.

VII. Notes on Statistical Data

The numbers on the Fuel Use Projections, Ethanol and Biodiesel Tables are guided by the following assumptions:

- Fuel use figures through 2019 are provided by the Philippine DOE, while the 2020 projections were calculated by Post.
- On-road diesel was derived by multiplying total diesel use for transport by 75-80 or the estimated percentage of on-road transport over total transport.
- Ethanol imports are based on data from the DOE and SRA.
- Post assumes ethanol stocks to be nil due to tightness in local supply.

Co-product production and feedstock use numbers are Post's estimates using the following conversion factors:

- Sugarcane co-product (bagasse) recovery of 300 kilos (kg) per ton of cane.
- For biodiesel, a ton of CNO yields around 1,090 liters of CME.
- A ton of sugarcane yields roughly 60 liters of fuel ethanol.
- A ton of molasses yields roughly 245 liters of ethanol.
- A ton of sugar yields around 500 liters of ethanol.

Attachments:

No Attachments