



Bangchak Corporation Plc.

Management Discussion & Analysis of Business Operation

For the 4th quarter and year ended December 31th, 2019



Greenovate
our Tomorrow

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Executive Summary

Summary of the Company and its subsidiaries' operating results for the year ended 31th December 2019

Unit: THB Million	Q4/2019	Q3/2019	QoQ	Q4/2018	YoY	2019	2018	YoY
Total Revenue	50,146	46,481	8%	48,781	3%	190,489	192,025	-1%
Accounting EBITDA	2,420	2,141	13%	(317)	862%	8,709	10,201	-15%
<i>Refinery and Trading Business Group</i> ^{1/}	1,073	631	70%	(1,421)	175%	2,871	3,928	-27%
<i>Marketing Business Group</i> ^{2/}	359	680	-47%	465	-23%	2,279	2,177	5%
<i>Power Plant Business Group</i> ^{3/}	795	710	12%	570	40%	2,964	3,569	-17%
<i>Bio-Based Product Business Group</i> ^{4/}	374	296	26%	68	449%	1,000	692	44%
<i>Natural Resource Business Group</i> ^{5/}	(57)	(101)	44%	94	-161%	(36)	117	-131%
<i>Others</i> ^{6/}	(124)	(75)	-66%	(92)	-35%	(369)	(282)	-31%
Net profit attributable to owners of the parent	620	370	68%	(1,546)	140%	1,732	2,463	-30%
Basic earnings per share (Baht)	0.38	0.27		(1.12)		1.18	1.79	

Note: 1/ EBITDA from Refinery Business of the Company, BCP Trading Pte. Ltd. and share of profit from associated companies

2/ EBITDA from Marketing Business of the Company, Bangchak Green Net Co.,Ltd., Bangchak Retail Co., Ltd., and share of profit from associated companies

3/ EBITDA from Power Plant Business of BCPG Plc., its subsidiaries, and share of profit from associated companies

4/ EBITDA from BBGI Plc., its subsidiaries, and share of profit from associated companies

5/ EBITDA from Natural Resources business of Nido Petroleum Pty. Ltd., BCP Energy International Pte. Ltd., BCP Innovation Pte. Ltd., BCPR Co., Ltd. and share of profit from associated companies

6/ Others items and elimination

As for performance in Q4/2019, Bangchak Corporation Plc. ("the company") and its subsidiaries earned revenue from selling of goods and rendering of service of THB 50,146 million (8% QoQ, 3% YoY), recorded EBITDA of THB 2,420 million (13% QoQ, 862% YoY), and recorded net profit of THB 620 million **of which the net profit attributable to owners of the parent THB 620 million** (68% QoQ, 140% YoY). Earnings per share was THB 0.38.

As for 2019 performance of the company and its subsidiaries, it is still affected by the fluctuations in oil price of the global market, where the oil business is in on a downward trajectory following slowing global economy due to the trade war between the US and China. The Dubai crude price in 2019 averaged at 63.51 \$/BBL, a decline of 6.14 \$/BBL or 10% compared to previous year. This has led to performance from 2018 to 2019 of the refinery industry, including the company's, to decline. In 2019, the company and its subsidiaries to earn THB 190,489 million (-1% YoY) in revenue from selling of goods and rendering of service, recorded EBITDA THB 8,709 million (-15% YoY), and recorded net profit of THB 1,732 million **of which the net profit attributable to owners of the parent THB 1,732 million** (-30% YoY). Earnings per share was THB 1.18, with performance from each business group as follow:

Refinery and Oil Trading Business Group, the refinery had an average crude run of 112.6 KBD or 94% utilization rate; the average crude run was higher than 2018 which underwent Turn Around Maintenance, and was able to average crude run at a historic high rate of 123.5 KBD during this past September. Meanwhile, Operating GRM declined by 1.69 \$/BBL from the previous year, which was affected by the crack spread of finished product and referenced crude oil price of every products; stemming from a state of excess supplies of finished products in the market, and declining demand from the

receding state of the global economy. Furthermore, crude oil price in the global market has been fluctuating throughout the year, especially between the periods of May to September 2019, where crude oil price declined from the tensions generated by the escalating trade war between the US and China. In tandem with the appreciating THB compared to the USD. As a result, the refinery business recorded an Inventory Loss of THB 1,253 million (including a reversion of lower of cost or market (LCM) THB 689 million) in 2019, which adversely affected the performance of the refinery business. As for the oil trading business operated by BCPT Trading Pte., Ltd. saw improvements in performance from last year. The amount of trade and transaction of crude oil and finished product increased from the move to expand transactions with its trade partners and introducing new products, under the company's strategic plan to expand the business.

Marketing Business Group recorded total sales volume increased 5% YoY, mainly from the retail market increasing by 7% YoY, stemming from the company's strategy to focus on expanding its customer base, and to actively push the sales of the B20 and B10 diesel with special grade within Bangchak service stations to increase availability coverage. The company developed the "Bangchak Hi-Diesel B20 S" and "Bangchak Hi-Diesel S B10" which upgraded the quality of fuel with the Green S technology that would bring out maximum engine performance. The products were well-received by customers. The company is able to continuously grow its market shares in terms of throughput per station, the company's cumulative market share of 2019 is at 16.0% and recorded an all-time high market share of 16.5% in September. Moreover, improvements were made to quality of service, and expanded the locations of service stations simultaneously with expansion of Non-Oil businesses, the total number of service as of the end of 2019 is more than 1,200 locations across the country. In terms of Net Marketing Margin, it declined from the previous year resulting from crude oil price in the global market increased during Q1/2019 and Q4/2019, and B100 product cost rose near the end of the year causing inconsistency between the retail price at service stations and rising finished product costs.

Power Plant Business Group recorded increase in electricity sales 24% YoY from the entire year's realization of revenue from the cooperative solar projects in collaboration with the War Veterans Organization of Thailand (WVO), and the commencement of commercial operation of the "Lom Ligor" wind power plant project, and the Solar Power Plant project in conjunction with the private floating solar "Bang Pa-In". Furthermore, the company extended its investment into the hydro power plant project in Laos PDR "Nam San 3A" which BCPG Plc. has acquired 100% shares as of the previous September. Thus, currently, the total PPA is 405.61 MW. The company realized a share of profit from associated companies THB 355 million, an increase from the geothermal power plant business in Indonesia. However, performance declined compared to 2018 due to the previous year realizing profit of THB 793 million from the divestment of the Nikaho and Nagi project to the Infrastructure Fund in Japan.

Bio-Based Product Business Group, by **the Biodiesel Business** reported production and sales volume of B100 products increased from the previous year with respect to the various measures taken by the government sector to solve the excess crude palm oil dilemma, including policies to promote the use of Biodiesel fuel (B100) within the energy sector. This has increased the demand for consumption of the product, consequently increasing the price of B100 products. Concurrently, the company prepared the production of B100 to follow the new standard of Monoglyceride content not exceeding 0.4%. Together with ability to efficiently manage raw material cost, gross profit was improved from the previous year.

Moreover, the company was able to efficiently manage raw material cost, improving gross profit from the previous year. As for **the Ethanol Business**, the quantity produced and sold increased from the previous year due to the KSL Green Innovation Plc. plant at Bo Ploy district, Kanchanaburi province increasing its production capacity from 66 million liters per year to 99 million liters per year, and the plant located at Nam Pong district, Khon Kaen province increased its production capacity from 45 million liters per year to 49.5 million liters per year. Moreover, the Bangchak Bioethanol (Chachoengsao) Co.,Ltd. also increased its production capacity. In addition to the improvement of raw material cost management - leading to increase

in gross profit, even though the average selling price of Ethanol declined due to domestic ethanol stock remaining at high levels.

Natural Resources Business Group recorded declines in performance due to in 2018, the business realized gains from the share divestment of Nido Production (Galoc) Pty.Ltd which held the rights to the Galoc oil field THB 78 million. With respect to the divestment, there was not realized revenue from Nido. Most of its 2019 performance derived from administrative expenses. The company realized share of profit from its investment in OKEA THB 26 million, even though share of profit from operation in this fiscal year was a loss, due to loss from the depreciated Norwegian Krone (NOK), and the impairment on Technical Goodwill from investments in the Gjøa field. However, the company realized gains from changes in investment interest at THB 82 million from initial public offering, resulting in an increase in share of profit from associated companies.

Important Events in 2019

January

- Important change in accounting policy from the International Financial Reporting Standards 15, Revenue from Contract with Customers (IFRS 15) which was enforced on the 1st January, 2019. The Group adopted protocols from IFRS 15 by way of realizing cumulative effect from the enforcement of the protocol from the first day of adoption (the 1st January 2019). The Company group did not restate any of its information representing 2018, of which IFRS 15 did not have any significant effect towards the Group's other revenue accounting policy, except for the sales of steam according to the Minimum take or pay contract of an associated company's group in Indonesia. Revenue recognition according to IFRS 15 will be realized once the business has accomplished its obligations. Therefore, the Company restated its financial statement as of the 1st January, 2019, with effect of the financial statement as follow:

Asset:	Investments in associated company declined	THB 54 million
Shareholder's equity:	Retained Earnings declined	THB 38 million
	None controlling interest declined	THB 16 million

- The annual general meeting of the BCP Innovation Pte.Ltd. approved a resolution to increase its registered capital from USD 42 million (attributed to 42 million shares, valued at USD 1 per share) to USD 45 million (attributed to 45 million shares, valued at USD 1 per share). The share capital has been paid up in full.
- The Company, via its Bangchak Initiative and Innovation Center or BIIC has invested in additional Startups through BCP Innovation Pte.Ltd., a subsidiary of the Company in January 2019. The company has invested in Enevate Corporation situated in California, USA, a reputable company of which specializes in vehicle lithium battery production technology. With its advanced innovation, it is able to sustain charges 10 times faster than normal charging

February

- The company started selling B20 Diesel in Bangchak Service Stations under the "B20 for large vehicles, reducing pollution, and saves money" campaign introduced by the Ministry of Energy for large vehicles, to help ease the pollution, and is a method to support farmers producing which is currently in a state of market oversupply and are selling at low price levels.

March

- The Company detected an irregularities in the Hydrocracking Unit's gas compressor, the unit's operation had to be temporarily halted to undergo a thorough examination and repair efforts on the compressor was carried out.

April

- On 5th April 2019, the Labor Protection Act was amended to include a requirement that an employee who is terminated after having been employed by the same employer for an uninterrupted period of twenty years or more, receives severance payment of 400 days of wages at the most recent rate. The Group has therefore amended its retirement plan in accordance with the changes in the Labor Protection Act. As a result of this change, the provision for retirement benefits and past service cost recognized during the second quarter of 2019 in the

consolidated and separate financial statements increased by an amount of Baht 140 million and Baht 133 million, respectively.

- The Extraordinary General Meeting of shareholders of BCP Innovation Pte. Ltd., a subsidiary of the Company, approved the increase in the registered capital from USD 45 million (divided to 45 million shares valued at USD 1 per share) to USD 46 million (divided to 46 million shares valued at USD 1 per share). The subsidiary had called up for the share subscription and received full payment at paid-up capital.
- The Company via Bangchak Initiative and Innovation Center or BIIC, had invested in additional Startups through BCP Innovation Pte. Ltd., a subsidiary of the Company, which has increased its investments in Bonumose, a company specializes in the production of healthy sugar from plant based material with high carbohydrate content. The technology is considered high potential, adding value to agricultural products, and able to add value to the Company's Bio-based business.
- Lom Ligor Co., Ltd., (a subsidiary of BCPG PLC.), an operator of the Wind Power Plant Project "Lom Ligor" with PPA capacity of 8.965 MW (Installed capacity of 10 MW) situated at Pakphanang district, Nakhon Si Thammarat province, has commenced its commercial electricity sales to the Provincial Electricity Authority on the 11th April 2019. The project receives revenue in electricity selling rate under an Adder scheme at the rate of THB 3.50 per unit for a period of 10 years.

June

- OKEA ASA ("OKEA") offered its share to the initial public offering (IPO) by issuing 15,000,000 shares in the Norwegian Stock Exchange (Oslo Stock Exchange) with an offering price of NOK 21 per share. BCPR purchased additional ordinary share under conditions which were part of the initial investment agreement, along with a purchase of IPO shares. In addition to this IPO, Greenshoe option was exercised and ended on 17th July 2019. As a result, BCPR held 47,477,563 ordinary shares with voting rights or equivalent to 46.62% of registered share capital of OKEA.
- The Company debuted the "Hi-Diesel B20S" product which is raised the quality of the B20 Diesel through the Green S technology resulting in increased cetane levels, boosting engine power, and a more effective engine cleanser, allowing the engine to operate at peak performance. B20S products are sold in Bangchak service stations at the same price as the original B20 Diesel product, offering consumers quality fuel at a bargain price, and acts as incentive to adopt B20 products.
- The Company debuted its line of B10 Diesel in Bangchak service stations under the name of "S B10", piloted in 2 service stations during the first month of its debut, and expanding availability to 12 service stations, currently comprising of 7 Bangkok locations, 2 more locations in its vicinity, and 3 up-country locations, i.e. Phetchabun, Nakhon Pathom, and Udon Thani. With further plans to expand B10 Diesel's availability in Bangchak service stations for nationwide coverage within the 1st March 2020, as a way to further pursue the policy to drive B10 sales continuously.

July

- The Company halted operations of the Hydrocracking Unit for 30 days from mid-July to mid-August, in order to maintain the unit's efficiency coinciding with the Company's crude run plan, while other units in the refinery were still operating as normal.

August

- The Company announced its interim dividend payment for the first six-month period of 2019 to the Company's shareholders at THB 0.50 per share, totaling THB 688 million. The dividend has been paid to the shareholders on 10th September 2019.
- The Company established BANGCHAK VENTURES PTE LTD. in Singapore, with registered capital of USD 100,000 under the goal of investing in Startup businesses pertaining to innovation, and the Company holds 100% shareholding.

September

- BCPG Indochina Company Ltd. (Subsidiary of BCPG Plc.) invested in a hydropower plant project in Laos PDR with total installed capacity of 69 MW. The indirect subsidiary acquired of 100% share of Nam San 3A Power Sole Co., Ltd. ("Nam San 3A") from Phongsuthavy Roads and Bridges Construction and Irrigation Sole Co., Ltd. for an amount of not exceeding USD 174 million (approximately THB 5,352 million). Nam San 3A is a Build-Operate-Transfer concessionaire to develop and operate the Project, and is a contracting party to the power purchase agreement with Take-or-Pay Condition with Électricité du Laos ("EDL"). The contract duration is 27 years starting from 29th January 2016.

October

- The Company issued subordinated perpetual debentures for a total credit facility of Baht 10,000 million which are name registered, unsecured, unconvertible, with a bond holder representative and no predetermined repayment schedule. The repayment schedule is a bullet payment upon the dissolution of the Company or upon the exercise of the issuer's call option as stipulated in the agreement. The interest rate for 1st - 5th year is a fixed rate of 5 percent per annum and with revisions every 5 year. The interest payment schedule is semi-annual for which the Company has an ability to indefinitely postpone the interest payment. The Company completed the sales of 10 million units, totally Baht 10,000 million debenture on 17th October 2019.

November

- The company approved the share repurchase program for financial management purpose in the maximum amount not exceeding THB 2,100 million and the number of the share to be repurchased is approximately 5.00% of the total issued shares. The repurchase on the Stock Exchange of Thailand period covers the duration of 6 months, starting from 6th December 2019 to 5th June 2020.

December

- The Company reported the result its Share Repurchase Program for Financial Management Purposes (Treasury Stocks). Since the start of the program until the 30th December 2019, the cumulative number of shares repurchased was 16,492,800 shares, with the total value of THB 431,860,810, or 1.20% of paid-up shares.

Statement of Income

Consolidated Statement of Income (Unit: Million Baht)	Q4/2019	Q3/2019	QoQ	Q4/2018	YoY	2019	2018	YoY
Revenue from sale of goods and rendering of services	50,146	46,481	8%	48,781	3%	190,489	192,025	-1%
Cost of sale of goods and rendering of services	(47,130)	(44,034)	7%	(48,357)	-3%	(180,257)	(180,594)	-0.2%
Gross Profit	3,017	2,447	23%	424	612%	10,232	11,431	-10%
Interest income and dividend income	59	31	90%	16	262%	158	55	186%
Other income	81	97	-16%	129	-37%	337	1,260	-73%
Selling and administrative expenses	(2,266)	(1,730)	31%	(2,148)	5%	(7,614)	(7,376)	3%
Exploration and evaluation expense	4	(0.1)	N/A	(15)	128%	(1)	(45)	99%
Gain (loss) from crude and product oil price hedging contract	140	6	N/A	(138)	N/A	147	(442)	N/A
Gain (loss) from foreign currency forward contracts	2	(4)	N/A	95	N/A	13	162	N/A
Gain on foreign exchange	274	115	N/A	52	N/A	614	415	N/A
Loss from impairment of assets	(34)	-	N/A	(15)	N/A	(34)	(441)	N/A
Share of profit of associate and JV	52	38	36%	21	144%	404	254	59%
Profit/(loss) before finance costs and income tax expense	1,329	1,001	33%	(1,579)	N/A	4,257	5,273	-19%
Finance costs	(425)	(412)	3%	(405)	5%	(1,701)	(1,545)	10%
Profit/(loss) before income tax expense	903	589	53%	(1,984)	N/A	2,556	3,728	-31%
Income tax (expense) credit	(36)	(38)	-4%	509	-107%	(68)	(493)	-86%
Profit for the period	867	551	57%	(1,475)	N/A	2,488	3,235	-23%
Owners of the parent	620	370		(1,546)		1,732	2,463	
Non-controlling interests	247	181		71		757	772	
Earnings per share (Baht per Share)	0.38	0.27		(1.12)		1.18	1.79	

The company and its subsidiaries reported a consolidated net profit of THB 2,488 million, a decline of 23% YoY. Net profit attributable to owners of the parent was THB 1,732 million, a decline of 30% YoY and earnings per share was THB 1.18, mainly due to the following reasons:

1. Revenue from sales of goods and rendering of services totaled at THB 190,489 million, a decrease slightly, mainly from petroleum related businesses. For the Company, it was affected by average selling price per unit that significantly declined with respect to global oil price. While the company's total product sales volume rose 4% YoY, additionally, trade transaction for crude oil and finished product under BCPT Trading Pte., Ltd. rose 71% YoY.
2. Gross profit was recorded at THB 10,232 million, a decline of 10% YoY, mainly from Total GRM which was USD 4.55 per barrel, compared to USD 5.61 per barrel in 2018 due to the crack spread of every category of finished product and referenced crude oil price declining. Also in 2019 the refinery business incurred inventory

Loss of THB 1,253 million (including a reversion lower of cost or market (LCM) THB 689 million), which declined from the previous year which recorded Inventory Loss of THB 1,489 million (including lower of cost or market (LCM) THB 689 million). Furthermore, Net Marketing Margin in 2019 declined from THB 0.78 per liter to THB 0.75 per liter, result from fluctuations of oil price throughout the year and B100 product cost that rose sharply near year's end. Whereas, the company was unable to adjust its retail price at service station to adequately correspond with rising costs.

3. Other incomes were recorded at THB 337 million, a decline of 73% YoY. In 2018, BCPG Plc. recorded a profit from selling of solar power plant assets to infrastructure fund in Japan at THB 793 million, and recorded insurance compensation for the damages from typhoons in Japan of THB 104 million.
4. Selling and administrative expense was THB 7,614 million, an increase of 3% YoY. Mostly from the personnel expenses in the company group, and the provision for employee benefits from the Labor Protection Act, which was amended on the 5th April 2019, requiring employees who had provided services for an uninterrupted period of twenty years or more to be entitled to severance valued at 400 days' worth of their final wage rate from 300 days.
5. Gains from foreign exchange was THB 614 million due to the appreciation of Thai Baht, leading to most gains being generated from accounts payable, and loans from foreign currencies.
6. Loss from asset impairment THB 34 million, most of the loss was incurred from impairment of Material Supplies, and fixed asset attributed to the company. In 2018 loss was incurred from impairment of petroleum exploration and production assets of the Galoc
7. Share of profit from associated companies was THB 404 million, comprising of (1) Star Energy Holdings Pte. Ltd. THB 328 million (2) PetroWind Energy Inc. THB 27 million (3) Ubol Bio Ethanol Plc. THB -9 million (4) Bongkot Marine Services Co., Ltd. THB 32 million (5) OKEA ASA THB 26 million.
8. Finance cost was THB 1,701 million, an increase of 10% YoY, mostly attributed to finance cost of the company from issuing a debenture in the amount of THB 4,000 million coupon rate of 2.13 - 3.42% with 2-7 years maturity, and issued another debenture in the amount of THB 7,000 million coupon rate of 4.04% with 10 year maturity in August and December 2018, respectively. However, during April 2019 a previous debenture worth THB 4,000 million reached maturity.

Summary of the Company and its subsidiaries' performance by Business unit

1.) Refinery and Oil Trading Business Group

Crude Oil Price Situation

(Unit : USD/BBL)

Crude oil price	Q4/2019		Q3/2019	QoQ	Q4/2018	YoY	2019	2018	YoY	
	Max	Min	AVG	AVG	+/-	AVG				+/-
Dubai (DB)	67.90	57.40	62.03	61.26	0.78	68.30	-6.26	63.51	69.65	-6.14
Dated Brent (DTD)	69.37	57.81	63.08	62.00	1.08	68.81	-5.73	64.21	71.31	-7.10
DTD/DB	4.32	-1.83	1.05	0.74	0.30	0.52	0.53	0.70	1.66	-0.96

Crude Oil Price Situation

Dubai crude price in Q4/2019 on average, increased by 0.78 \$/BBL compared to Q3/2019. This is supported by the efforts of the OPEC members to lower the production quantity of crude oil, as to stabilize crude oil price. As well as Saudi Arabia's desiring to keep oil price at high levels, the rise in oil price levels is beneficial to the budget and Initial Public Offering of the Saudi Arabian state enterprise's Saudi Aramco company. Furthermore, during the 5th to the 6th December 2019, the OPEC members and their allies held a meeting in Vienna where they agreed to deepen the crude oil production quantity cut by another 0.5 million barrels per day from the previous agreed upon 1.2 million barrels per day reduction, therefore the total amount of crude oil production to be reduced is 1.7 million barrels per day from the beginning of 2020. Moreover, the OPEC members and their allies will reconvene to further establish their production policy in early March 2020. In addition, crude oil price is supported by the brisk pace of the trade negotiation between the US and China, the said news has renewed hope of the end of the trade war that has transpired for the past several months; expecting an increase in demand for oil.

Average Dubai crude price in 2019 compared to 2018 declined by 6.14 \$/BBL, the oil price was pressured throughout the year by a slowing global economy due to the trade war between the US and China, which inadvertently lowered global oil demand. This also coincides with the International Monetary Fund (IMF) estimating the world economy was on a direction towards the slowest growth since the 2008 financial crisis, and also revised their 2019 global economic growth estimate to just 2.9 percent. Also, the International Energy Agency (IEA) adjusted their estimate of global oil demand growth to just 1.0 million barrels per day, a reduction of 0.4 million barrels per day from the forecast made in early 2019.

Dated Brent and Dubai spread (DTD/DB) in Q4/2019 on average increased by 0.30 \$/BBL when compared to Q3/2019, due to the oil support received from the mounting demand of light crude in Asia, to prep for the production of the bunker oil with Sulphur content not exceeding 0.5% in 2020.

When comparing Dated Brent and Dubai spread (DTD/DB) average between 2019 and 2018, a decline of 0.96 \$/BBL, this is due to pressures from light crude supplies that has reverted to its excess position in the market compared to the previous year where supplies were tight. As such, crude production from the US which is the light crude increased to the level of 12.85 million barrels per day in late 2019.



Crack Spreads Situation

(Unit: USD/BBL)

Crack Spreads	Q4/2019			Q3/2019	QoQ	Q4/2018	YoY	2019	2018	YoY
	Max	Min	AVG	AVG	+/-	AVG	+/-			
UNL95/DB	20.62	7.08	12.97	11.63	1.34	4.92	8.06	9.07	10.57	-1.51
IK/DB	17.96	11.51	13.94	15.74	-1.80	15.74	-1.80	13.73	15.38	-1.65
GO/DB	17.71	11.64	14.32	15.34	-1.02	14.98	-0.67	13.72	14.68	-0.96
FO/DB	-5.82	-29.19	-18.59	1.11	-19.70	1.33	-19.92	-4.91	-2.64	-2.28

Crack Spreads Analysis

- Gasoline and Dubai crack spread (UNL95/DB) in Q4/2019 averaged at 12.97 \$/BBL, an increase of 1.34 \$/BBL when compared to the previous quarter, due to support from the still solid Gasoline demand from India, in which the region's domestic refineries are still closed for turnaround maintenance as to prepare for the production of clean fuel in 2020.

Gasoline and Dubai crack spread (UNL95/DB) in 2019 averaged at 9.07 \$/BBL, a decline of 1.51 \$/BBL compared to 2018, due to pressures from the tense situation engendered by the trade war between the US and China causing the Gasoline demand to retract and further pressure stems from the quantity of Shale Oil, which has a Gasoline yield of 52.2%, rising by 1.2 million barrels per day leading to supplies of Gasoline to remain in a state of market excess compare to 2018.

- Jet (Kerosene) and Dubai crack spread (IK/DB) in Q4/2019 averaged at 13.94 \$/BBL, a decline of 1.80 \$/BBL compared to the previous quarter. Due to pressure from slowing economic condition and the trade war between the US and China caused demand to lower within the air transport and tourism industries.

Jet (Kerosene) and Dubai crack spread (IK/DB) in 2019 averaged at 13.73 \$/BBL, a decline of 1.65 \$/BBL compared to 2018. This is due to pressure from supply build up after refineries increased production capacity during their preparation for the imminent adoption of the bunker oil with Sulphur content not exceed 0.5% in 2020.

- Gasoil and Dubai crack spread (GO/DB) in Q4/2019 averaged at 14.32 \$/BBL, a decline of 1.02 \$/BBL compared to the previous quarter. Due to pressure from increasing supplies from Chinese exports, in which the various refineries rushing to export in accordance to the 2019 quota they had received within the year. As well as Indian export numbers growing significantly from economic growth slowdown affecting the demand for Diesel within India to decline tremendously, combined with a longer than usual Monsoon season.

Gasoil and Dubai crack spread (GO/DB) in 2019 averaged at 13.72 \$/BBL, a decline of 0.96 \$/BBL compared to 2018. This is due to pressure from increasing supplies after refineries increased production capacity during their preparation for the imminent adoption of the bunker oil with Sulphur content not exceed 0.5% in 2020. Whereas demand for Diesel within the region has not increased in a capacity that is of significance to mirror estimates made by the market earlier, as traders switch their reserve stocks more towards the proportion of Low Sulphur Fuel Oil which has a lower price as oppose to Diesel fuel, and stocking supplies to readily cater to the market.

- Fuel Oil and Dubai crack spread (FO/DB) in Q4/2019 averaged at -18.59 \$/BBL, a decline of 19.70 \$/BBL compared to the previous quarter, this is due to the pressure from the demand of High Sulphur Fuel Oil that has successively plummeted prior to the enforcement of the usage of the bunker oil with Sulphur content not exceeding 0.5% by International Maritime Organization (IMO) which will start on the 1st January 2020.

Fuel Oil and Dubai crack spread (FO/DB) in 2019 averaged at -4.91 \$/BBL a decrease of 2.28 \$/BBL when compared to 2018, due to pressures from the demand for High Sulphur Fuel Oil that lowered in succession prior to the enforcement of the usage of the bunker oil with Sulphur content not exceeding 0.5% would be enacted.

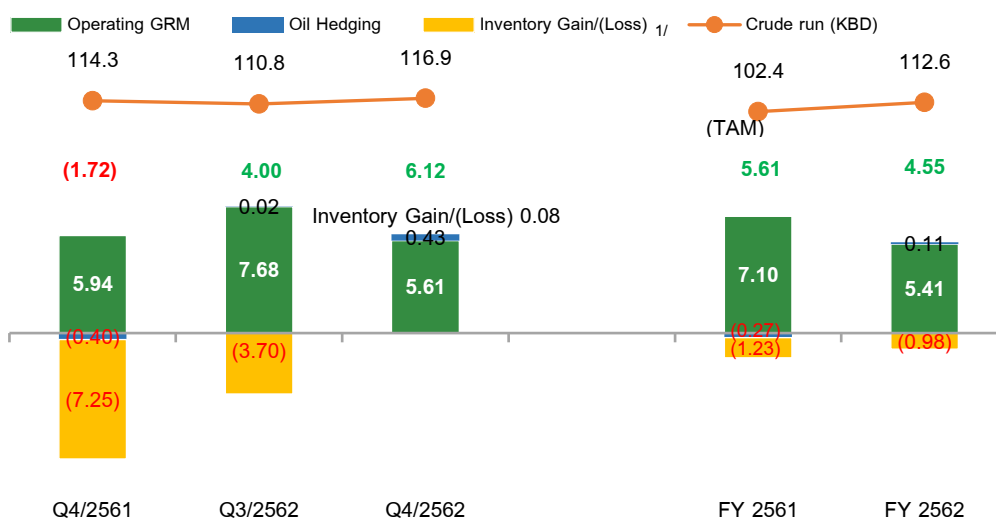
Refinery and Trading Business Group Performance

Refinery Business Performance	Q4/2019	Q3/2019	QoQ	Q4/2018	YoY	2562	2561	YoY
Average Crude Run (KBD)	116.9	110.8	6%	114.3	2%	112.6	102.4	10%
Utilization Rate (%)	97%	92%		95%		94%	85%	
Average FX (THB/USD)	30.45	30.89		32.98		31.22	32.49	
(Unit: Million Baht)								
Operating GRM	1,837	2,416	-24%	2,060	-11%	6,944	8,626	-20%
GRM Hedging	140	6	N/A	(138)	201%	147	(328)	145%
Inventory Gain/ (Loss) ^{1/}	26	(1,163)	102%	(2,517)	101%	(1,253)	(1,489)	16%
Total GRM	2,003	1,258	59%	(595)	437%	5,838	6,809	-14%
EBITDA	1,073	631	70%	(1,421)	175%	2,871	3,928	-27%

Note: 1/ Inventory Gain/(Loss) in the table included LCM

GRM and Crude Run

Unit: \$/BBL



Note: 1/ Inventory Gain/(Loss) in the table included LCM

Total Sales Volume in each market category of the Company	Q4/2019	Q3/2019	QoQ	Q4/2018	YoY	2019	2018	YoY
Marketing Business								
Retail	1,095	1,077	2%	1,025	7%	4,297	4,020	7%
Industrial	536	447	20%	501	7%	1,921	1,925	-0.2%
Total	1,631	1,523	7%	1,526	7%	6,218	5,945	5%
Wholesale Business								
Petroleum traders in accordance with section 7	147	151	-3%	149	-2%	584	622	-6%
Export	316	323	-2%	334	-5%	1,090	1,026	6%
Total	463	474	-2%	483	-4%	1,674	1,648	2%
Total Sales Volume	2,094	1,998	5%	2,009	4%	7,892	7,593	4%

Note: Sales volume does not include oil swaps between major oil companies (petroleum traders in accordance with section 7) and sales of crude oil products

Performance for Q4/2019, the refinery business recorded EBITDA THB 1,073 million, an increase of THB 442 million compared to Q3/2019 with the following factors affecting performance as follow:

1. The Bangchak refinery averaged its production in Q4/2019 at 116.9 KBD or 97% utilization rate, which is higher than the previous quarter's average production that experienced a temporary halt of the Hydrocracking Unit during the mid-July to mid-August. The refinery returned to full capacity after maintenance of the Hydrocracking Unit was completed. However, during the final month of the quarter there was a reduction in production capacity down to the level that is most economically optimal due to most of the crack spread between the finished product and referenced crude oil declined drastically. As well as, the crude cost increased with significance.

2. Within this quarter, the refinery's Total Gross Refinery Margin (Total GRM) was THB 2,003 million or 6.12 \$/BBL, an increase of 59% compared to Q3/2019 which had Total GRM of THB 1,258 million or 4.00 \$/BBL, mainly due to the following reasons:

- Operating GRM lowered THB 578 million, compared to Q3/2019, mainly from most finished product price and crude oil price crack spread adjusting downward from the slowing of the Global economy and the trade war between the US and China, lowering oil demand. With average Gasoil and Dubai crack spread (GO/DB) lowering 1.02 \$/BBL while the average Kerosene and Dubai crack spread (IK/DB) lowered by 1.80 \$/BBL. And the average Fuel Oil and Dubai crack spread (FO/DB) declined 19.70 \$/BBL due to the lowered demand for High Sulphur Fuel Oil from the preparation preceding the enforcement of the adoption of the Low Sulphur Fuel Oil under measures mandated by the IMO, combined with crude cost that rose from rising spread between the price of Dated Brent and Dubai (DTD/DB) average rising by 0.30 \$/BBL. As well as increasing the shipping freight cost, after the US announced their sanction of subsidiaries of the COSCO group, which is one of the largest transport and logistic company in China during late September 2019, effectively lowering the Operating GRM.
- During this quarter, the refinery received gains from crude and product oil price hedging contract THB 140 million due to the oil price volatility of the period, the company revised its portfolio to manage oil price fluctuation. Whereas in Q3/2019, the refinery realized gain of THB 6 million.
- The refinery business realized slight inventory gain even when crude price throughout the global market continue to increase since early October to December 2019 from the efforts of the OPEC members to

lower production quantity, and the trade negotiations between the US and China progressed smoothly. However, the average crude cost used for production in Q4/2019, partially reflects the high crude oil price during Q3/2019. However, inventory loss was logged in at THB 1,163 million in previous quarter (including a reversion of lower of cost or market (LCM) THB 15 million) from the average crude oil price which adjusted downward significantly since early August until early September.

3. BCP Trading Co., Ltd. ("BCPT") booked higher gross profit than in Q3/2019 from increases in its transactions in both terms of trade volume and transactions with new trade partners. During this quarter BCPT transacted trade of crude oil and petroleum product 7.58 million barrels, an increase of 0.78 million barrels (+12%) compared to the previous quarter. Most of the increase can be attributed to trade with partners abroad in the form of Overseas Trading (Out-Out) for Low Sulphur Fuel Oil products and fuel oils that were further refined to add more value to the product. Since the market has begun trading Low Sulphur Fuel Oil adhering to the IMO standards that would take effect on the 1st January 2020.

Performance comparison between 2019 and 2018, the refinery business group recorded EBITDA decreases of THB 1,057 million, with the following factors affecting performance:

1. The Bangchak refinery's average production rate in 2019 was at 112.6 KBD or 94% utilization rate of total refinery production which is higher than the average production capacity of 2018 that underwent a Turn Around Maintenance.

2. Total Gross Refinery Margin (Total GRM) declined THB 971 million compared to 2018, mainly due to the following reasons:

- Operating GRM decreased THB 1,682 million compared to 2018. Mainly from the crack spread of finished product and reference crude oil for every product declining. This is due to the market being in a state of excess supplies and market demand declining from the slowdown of the global economy. Gasoline and Dubai crack spread (UNL/DB) on average declined 1.51 \$/BBL, Gasoil and Dubai crack spread (GO/DB) on average declined 0.96 \$/BBL, Kerosene and Dubai crack spread (IK/DB) on average declined 1.65 \$/BBL, and demand for High Sulphur Fuel Oil declined before the measures introduced by IMO were to be enforced causing the Fuel Oil and Dubai crack spread (FO/DB) average to decline by 2.28 \$/BBL. Furthermore, the Thai Baht had appreciated 1.27 THB/USD when compared to 2018.
- During 2019, the refinery business made gains from crude and product oil price hedging contract THB 147 million, whereas in 2018 suffered a loss of THB 328 million from fluctuations of global oil price throughout the year.
- The refinery business encountered an inventory loss of THB 1,253 million (including a reversion of lower of cost or market (LCM) THB 689 million) from the fluctuations made by the oil price in the global market throughout the year 2019, especially from the period between May to September; the decline during the aforementioned period was a result of the tension caused by the trade war between the US and China escalating in intensity – leading to decline in oil demand. Moreover, the Thai Baht has appreciated. Whereas in 2018 inventory loss was recorded at THB 1,489 million (including lower of cost or market (LCM) THB 689 million) due to the sharp decline of crude oil price in the global market between November and December 2018 since the market being in a state of supply excess.

3. BCP Trading Co., Ltd. recorded higher gross profit from 2018 due to an increase in finished product and crude oil transactions by 10.82 million barrels (+71%) compared to 2018. The main products that were transacted include crude oil, Gasoline, and Fuel Oil. Within this year BCPT was able to expand their market to new regions such as Australia, Taiwan, and the US. As well as, trading new products such as Heavy Aromatic and Ethanol for instance. As such, BCPT is still going forward with the expansion of trade transactions with new partners, along the company's strategic plans to expand the business.

2.) Marketing Business Group

Marketing Business

Sales Volume (Million Liters)	Q4/2019	Q3/2019	QoQ	Q4/2018	YoY	2019	2018	YoY
Retail (Service Stations)	1,095	1,077	2%	1,025	7%	4,297	4,020	7%
Industrial	536	447	20%	501	7%	1,921	1,925	-0.2%
Total	1,631	1,523	7%	1,526	7%	6,218	5,945	5%
Sales volume in each product category (Million Liters)								
LPG	46	36	30%	41	13%	152	163	-7%
Gasoline	12	8	55%	10	19%	35	32	10%
Gasohol	437	428	2%	432	1%	1,705	1,672	2%
Jet Fuel	258	239	8%	204	27%	951	836	14%
Diesel	841	776	8%	795	6%	3,224	3,056	5%
Fuel Oil and Others	36	38	-4%	43	-16%	152	185	-18%
Total Sales Volume	1,631	1,523	7%	1,526	7%	6,218	5,945	5%
Total Marketing Margin (Baht/Liter)	0.70	0.77	-9%	0.85	-18%	0.75	0.78	-4%
EBITDA (Million Baht)	359	680	-47%	465	-23%	2,279	2,177	5%

Note: marketing margin of Bangchak only

Performance of Q4/2019 compared to Q3/2019, the Marketing Business Group recorded an EBITDA of THB 359 million which declined by THB 321 million compared to Q3/2019, with the following factors affecting performance:

1. Total sales volume of the marketing business increased 7% QoQ, mainly from the volume of fuel sold through the industrial market increasing 20% QoQ, with the sales push during periods when demand of customers within the industrial market was higher; due to the harvest season for the groups of agriculture customer approaches, as well as the traveling season kicking into gear. Combined with the fact that during this quarter, other domestic refineries had undergone Turn Around Maintenance, causing domestic supplies to drop. As for the retail market, sales volume increased 2% from the previous quarter, as such the retail market has plans to grow continuously from the expansion of their customer base from implementation of the strategies formed by the company. In addition, the amount of domestic demand for oil has grown substantially. This has led to the amount of Diesel and Gasohol product sales to rise significantly, whereas the previous quarter was within the rainy season bringing about flooding in various regions causing the frequency of automobile use and consumption of oil to falter.

2. Net marketing margin declined compared to the previous quarter due to finished product cost rising following the hike of oil price in the global market, and the increase in the cost of the B100 products near the end of the year. Whereas, the company was unable to adjust retail price at service stations to adequately coincide with the rising cost of oil products. Moreover, the declined margin was also affected from unadjusted oil price upward as a gift for the Thai people during the New Year celebrations from the 27th December 2019 to the 3rd January 2020.

3. The company has been operating under the strategy to expand its customer base and to garner higher throughput per stations, by expanding the number of standard sized service stations to cover more areas with high potential. There was a total 17 new stations opening in this quarter. As a result, the company's market retail shares through service stations has continuously increased, with the cumulative market share of 2019 at 16.0%. During this quarter, the company has also expanded the number of service stations with B10 Diesel availability in accordance with policies mandated by the



Ministry of Energy that stipulates that the B10 Diesel will become the standard High-Speed Diesel fuel since the 1st January 2020. Moreover, the company has developed the specification of the B10 Diesel with the Green S technology, simultaneously adding the S Super Booster additive to improve engine combustion performance, and the S Super Purifier as a cleaning agent for fuel injectors; in order to yield highest quality B10 Diesel product. As well as contributing to the lowering of the PM 2.5 pollutant, the company has proceeded to improve the quality of all Diesel products sold through the Bangchak service stations in the vicinity of Bangkok to be at Euro 5 standards, with Sulphur content measuring lower than 10 PPM, and has 5 times lower Sulphur content compared to the Euro 4 standard. The Euro 5 standards will be sold at the same price of the Euro 4 standard from the 15th December 2019 to the 29th February 2020.

4. Bangchak Retail Co., Ltd. (“BCR”) is still continuously developing and expanding the Inthanin coffee shop business. The coffee shops have been opened both inside and outside the perimeter of Bangchak service stations, in order to broaden its customer base and be able to better reach consumers. In this quarter, a total of 53 branches of Inthanin were opened. Branches were opened in hotels, universities, convenience stores, and department stores e.g. hotels in the Khao Sarn area, the Faculty of Science and Technology Thammasat University, Tesco Lotus, and Central Plaza Salaya, instance; as well as having exhibition booths at various exposition events. As for the SPAR convenience store, the brand established more varied sales promotion campaigns e.g. SPAR Aroi-Tua-Thai which brings foods and desserts from reputable proprietors to be sold in various branches, and participating in the “Taste, Shop, Spend” program launched by the government. Overall, from the expansion of branches, the development of store management, and activities to promote sales through various channels have led to BCR’s revenue to increase by 12%QoQ. As for the selling and administrative expenses rose from the increase in sales promotion associated with the long weekends and the end of the year, employee related expenses, as well as costs that varied with higher sales volume such as logistics cost. Within this quarter EBITDA declined by 7%.

5. It is a common occurrence for this quarter to bear higher selling and administrative expenses from employee related expenses, promotional expenses, also including the annual maintenance cost of service stations, which has caused EBITDA to decline from the previous quarter.

Marketing Business performance in 2019 recorded EBITDA of THB 2,279 million, an increment of THB 103 million when compared to 2018, with factors affecting operations as follow:

1. Total sales volume of the marketing business group grew 5% YoY, primarily from the sales volume of oil in the retail market adjusting upward 7% YoY, due to expansion of its customer base following the company’s strategy and the sales push for special grade B20 and B10 Diesel fuel within the Bangchak service stations to provide consumers with high quality oil that is environmentally friendly through the reduction of pollution emission from the combustion process, while serving to assist farmers. Whereas the industrial market recorded marginally lower oil sales compared to the previous year due to the intense competition brewing within the industrial market, and stock management within the refinery during the Hydrocracking Unit maintenance period – as to not affect the sales of the retail market.

2. Net marketing margin in 2019 declined 4% compared to 2018, during Q1/2019 and Q4/2019 the price of oil in the global market rose and the cost of B100 products also rose during the end of the year which has caused the retail price at service stations to become inconsistent with rising in finished product costs. While in Q4/2018, the price of oil in the global market dropped drastically due to pressures from the global oversupply of crude oil. This allowed the company to set its retail price to adequately match the product cost, combined with the intense state of the price driven competition in the industrial market, culminating in net marketing margin of 2019 to decline compared to the previous year.

3. The company’s cumulative market share in 2019 was at 16.0%, whereas the cumulative share in 2018 was at 15.6%, the number of BCP service stations as of year end 2019 amounts to 1,201 locations, with 48 new service

stations commencing operation. The company also promoted the sales of B20 Diesel in support of the “Bangchak B20 for large vehicles, reducing pollution, and saves money” campaign which began with the sales of B20 Diesel in service stations since Q1/2019 and began selling B10 Diesel in June 2019. Furthermore, the company developed the “Bangchak Hi-Diesel B20S” product and the “Bangchak Hi-Diesel S B10” product that exalted the qualities of the product with the Green S technology, which helps engines run at peak performance. Moreover, the company has increase the B10 and B20 Diesel availability in more of its service stations, which has been well-received by customers.

4. The Non-oil business, under the supervision of Bangchak Retail Co., Ltd. (“BCR”) is still developing and expanding its business continuously. As of 2019, the number of SPAR convenient stores was 46 locations, which has received numerous successive sales promotion campaign, as well as a revamp of the product mix to serve customer demands with higher precision such as ready meal products. Meanwhile, the number of Inthanin Coffee Shops was 600 locations, with 111 locations opening in 2019, in which their locations are situated in areas with high potential e.g. universities, convenience stores, supermarkets, department stores, including branches in office buildings. The expansion of branches, the development and improvement of store management, and the various sales promotion campaigns has led to BCR to increase revenue by 34% YoY and recorded a rise in EBITDA by 30% YoY.

3.) Power Plant Business Group

Power Plant Business Performance	Q4/2562	Q3/2562	QoQ	Q4/2561	YoY	2562	2561	YoY
Solar Power Business – Thailand	75.63	65.75	15%	73.03	4%	286.59	270.00	6%
<i>Phase 1-3 (118 MW – Adder 8 THB)</i>	66.25	57.57	15%	64.53	3%	251.63	244.90	3%
<i>Cooperative Solar (12 MW – FIT 5.66 THB)</i>	5.07	4.61	10%	4.89	4%	19.21	18.84	2%
<i>Government Solar (8.94 MW – FIT 4.12 THB)</i>	3.60	3.26	10%	3.55	1%	14.17	6.20	129%
<i>Solar rooftop (0.80 MW)</i>	0.33	0.30	11%	0.06	N/A	1.19	0.06	N/A
<i>Private floating Solar – Bang Pa In (2.1 MW)</i>	0.39	N/A	N/A	N/A	N/A	0.39	N/A	N/A
Solar Power Business – Japan (14.7 MW)	3.52	5.00	-30%	3.92	-10%	18.00	41.83	-57%
Wind Power Business – Thailand (9.0 MW - Adder 3.5 THB)	3.19	4.29	-26%	N/A	N/A	10.02	N/A	N/A
Hydro Power Business - Laos (69.0 MW)	64.34	7.70	N/A	N/A	N/A	72.04	N/A	N/A
Total Electricity Sales (Million kWh)	146.69	82.74	77%	76.95	91%	386.65	311.83	24%
Revenue (Million Baht)	981	790	24%	815	20%	3,427	3,320	3%
Share of profit (loss) from associated companies								
Wind Power Plant	(7)	16	-141%	11	-164%	27	39	-32%
Geothermal Power Plant	54	107	-49%	(8)	N/A	328	164	99%
EBITDA (ล้านบาท)	795	710	12%	570	40%	2,964	3,569	-17%

Performance of the Power Plant business in Q4/2019 recorded an EBITDA of THB 795 million an increase of THB 85 million when compared to Q3/2019, with the following factors affecting operations as follow:

1. Solar power plant projects in Thailand recorded total electricity sales increase by 15% QoQ, mainly due to higher average irradiation hours, which is a result of the clear weather and lower amount of rainfall from the previous quarter, as well as commercial operation of a private floating solar - Bang Pa In commenced in November 2019 (PPA 2.1 MW).

2. Solar power plant projects in Japan recorded a decrease in electricity sales by 30% QoQ, due to Japan transitioning into its winter season, leaving little exposure to light, as well as bouts of clouds and fogs spread throughout various areas, causing to a lower average irradiation hours.

3. Wind power plant project in Thailand, “Lom Ligor”, recorded lower electricity sales by 26% QoQ, due to faltering wind speed that was sweeping through the project location, causing to the power plant to produce less electricity than the previous quarter.

4. Hydro power plant project in Laos “Nam San 3A”, recorded electricity sales of 64.34 Million kWh, an increase by 56.65 Million kWh from the previous quarter. Due to Q4/2019 being the first quarter to realize full performance after 100% shares of the project was acquired by BCPG Plc. in late September 2019.

5. Recorded shares of profit from investments in associated companies in amount of THB 48 million, which was lower than the previous quarter by THB 76 million, with details as follow:

- Share of loss from the wind power plant business in the Philippines was recorded at THB 7 million, comprised of share of profit from operation THB 1 million, and an amortization in rights in agreement to sell electricity in amount of THB 8 million. As such share of profit from operation declined from the previous quarter by THB 23 million, mainly due to Q4/2019 experiencing unusually lower wind speed compared to Q3/2019 which was under the influence of tropical depressions that swept through more frequently than usual.

- Share of profit from the geothermal power plant in Indonesia was THB 54 million, attributed to share of profit from operation THB 146 million, and an amortization in right in agreement to sell electricity THB 91 million. Share of profit from operation declined from the previous quarter THB 54 million, mainly due to longer maintenance shutdown period of the Geothermal Power Plant, compared to the previous quarter.

Performance in 2019 of the Power Plant Business recorded EBITDA of THB 2,964 million, a decline of THB 605 million when compared to 2018, with the following factor affecting operation as follow:

1. Solar power plant projects in Thailand recorded increased total electricity sales 6% YoY, mainly due to clear weather and lower rainfall compared to the previous year. In tandem with the full revenue recognition of two cooperative solar projects in collaboration with the War Veterans Organization of Thailand (WVO) (PPA 8.94 MW), which have commenced commercial operations since July 2018. Also, commercial operation of a Private floating Solar - Bang Pa In commenced in November 2019 (PPA 2.1 MW).

2. Solar power plant projects in Japan recorded a decrease in electricity sales by 57% YoY, mainly attributed to a reduction in production after the divestment of the Nikaho and the Nagi project (total PPA 19.3 MW) to the Infrastructure Fund in Japan during September 2018 and realized gain from the selling of asset in the amount of THB 793 million.

3. Wind power plant project based in Thailand, "Lom Ligor", recorded electricity sales of 10.02 Million kWh. The Lom Ligor project commenced commercial selling of its electricity since the 11th April 2019 to the Provincial Electricity Authority with PPA 8.965 MW.

4. The Hydro Power Plant project in Laos PDR "Nam San 3A" sold electricity in the amount of 72.04 Million kWh. The project started to realize revenue from the selling of electricity in late September 2019 after BCPG Plc. acquired 100% of its shares.

5. Recorded the share of profit from investments in associated companies THB 355 million, compared to the same period of the previous year which increased by THB 151 million, due to the following factors:

- Share of profit from the wind power plant business in the Philippines was THB 27 million, attributed to share of profit from operations THB 59 million, and an amortization in right in agreement to sell electricity THB 32 million. Share of profit from operation declined THB 14 million due to drops in wind speed blowing through the project location when compared with the previous year and an increase in interest expense followed a higher of the policy rate in the Philippines. However, the associated company has already negotiated to the similar level as before.
- Share of profit from the geothermal power plant business in Indonesia was THB 328 million, attributed to share of profit from operations THB 703 million, and an amortization in right in agreement to sell electricity THB 375 million. Share of profit from operations lowered by THB 58 million, mainly due to longer planned maintenance shutdown period in 2019. However, net share of profit increased by THB 164 million due to 2018 recorded full amortization of deferred issuance cost resulted from refinancing activity in the amount of THB 123 million and a tax provision in an amount of THB 84 million.

4.) Bio-Based Product Business Group

Performance of the Bio-based Product Business Group in Q4/2019 recorded EBITDA was THB 374 million, an increase of THB 78 million when compared to Q3/2019. As for performance in 2019 recorded EBITDA of THB 1,000 million, an increase of THB 308 million when compared to 2018.

Biodiesel Business

Biodiesel Business Performance	Q4/2019	Q3/2019	QoQ	Q4/2018	YoY	2019	2018	YoY
B100 Production Volume (Million Liters)	78.49	79.51	-1%	69.11	14%	299.38	264.10	13%
B100 Sales Volume (Million Liters)	87.53	86.94	1%	73.99	18%	327.69	281.08	17%
Revenue (Million Baht)	1,543	1,604	-4%	1,401	10%	5,875	6,186	-5%
Gross Profit (Million Baht)	209	66	220%	43	384%	393	349	13%
Average Sales Price (Source: Department of Energy Business, Ministry of Energy)								
B100 (Baht/Liter)	25.25	21.74	16%	21.85	16%	22.21	24.16	-8%
Crude Palm Oil (CPO) (Baht/Kg.)	22.47	16.85	33%	16.94	33%	18.10	19.59	-8%

Performance comparison between Q4/2019 and Q3/2019 are as follow:

1. B100 product production volume in Q4/2019 was at 78.49 million liters, and the B100 product sales volume was at 87.53 million liters, both production and sales volume remain in the high level similar to the numbers attained during previous quarter. A result of government policy to advocate the adoption of B20 and B10 Diesel, in support of higher consumption of the biodiesel fuel (B100) in the energy sector.

2. Average selling price of B100 product increased significantly from the previous quarter, which corresponded to the rising price of crude palm oil, resulting from measures taken by the government sector to propagate the usage of the B10 Diesel. Combined with the quarter being a low crop season for palm coming into the market, which shrank the amount of domestic crude palm oil stock. Moreover, increasing in the average B100 product price should subsequently resulted in this quarter recording higher revenue from sales. However, due to adjustment to the recognition of revenue from the sales of B100 product, this has caused revenue from sales in this quarter to be recorded at THB 1,543 million, a decline of 4% from the previous quarter.

3. Gross profit in Q4/2019 recorded at THB 209 million, an increase of 220% QoQ. Mainly from the average selling price of B100 product that adjusted upward from the previous quarter, in tandem with the ability to proficiently manage raw material cost; leading to inventory gain in the Biodiesel business during this quarter.

Performance comparison between 2019 and 2018 are as follow:

1. B100 production volume in 2019 was 299.38 million liters, an increase of 13% YoY, which coincided with the direction of the amount of B100 product sold that rose by 17% YoY. Mainly attributed to the increase in B100 product purchase order made by Bangchak with respect to the government sector's advocacy for the increase in consumption of Biodiesel fuel (B100) within the energy sector, and from the capacity improvements made to the production process which allowed for full capacity utilization.

2. Average selling price of B100 product declined from the previous year, in the same direction as the crude palm oil price that declined. However, in the latter half of 2019, price started to climb as a result from various measures



taken by the government sector to alleviate the excess crude palm oil problem in the market e.g. the Electricity Generating Authority of Thailand (EGAT) has offered to buy and use crude palm oil as fuel in electricity generation. The government sector has increased measures to facilitate the use of B10 and B20 diesel, as well as, designating the B10 diesel as the standard diesel type in the market. The B100 price (according to announcements made by the Department of Energy Business) has adjusted upward to peak levels during late December 2019 at 34.86 THB/Liter, and from adjustment to the recognition of the sales of B100 products affected revenue from sales declined 5% YoY, despite the B100 product sales volume increasing.

3. Gross profit in 2019 was recorded at THB 393 million, an increase of 13% YoY, although sales revenue from B100 product declined. However the outstanding adeptness to manage raw material cost has caused the Biodiesel business to achieve an Inventory Gain.

Ethanol Business

Ethanol Business Performance	Q4/2019	Q3/2019	QoQ	Q4/2018	YoY	2019	2018	YoY
Production Volume (Million Liters)								
Bangchak Bioethanol (Chachoengsao) (BBE)	12.84	13.15	-2%	12.34	4%	46.84	44.57	5%
KSL Green Innovation (KGI)	30.81	40.02	-23%	13.96	121%	147.64	105.19	40%
Ethanol Sales Volume (Million Liters)	44.51	51.18	-13%	32.31	38%	189.43	149.17	27%
Revenue (Million Baht)	969	1,096	-12%	744	30%	4,138	3,602	15%
Gross Profit (Million Baht)	142	182	-22%	5	N/A	503	281	79%
Average Sales Price (Source: Department of Energy Business, Ministry of Energy)								
Ethanol (Baht / Liter)	22.04	21.96	0.4%	23.31	-5%	22.08	23.70	-7%

Performance comparison between Q4/2019 and Q3/2019

1. Total production volume of Ethanol product was at 43.65 million liters, a decline of 18% QoQ, with the decreasing in production volume of the KSL Green Innovation Plc. ("KGI") by 23%, due to the plants at the Bo Ploy district, Kanchanaburi province and Nam Pong district, Khon Kaen province underwent their turnaround maintenances. Whereas, the Bangchak Bioethanol (Chachoengsao) Co., Ltd. ("BBE") also underwent maintenance to improve production capacity, leading to production to quantity to decline by 2%

2. Total ethanol sales volume was recorded at 44.51 million liters, a decline of 13% QoQ, mainly from KGI's volume of Ethanol sales volume lowering by 17% QoQ, corresponding with KGI's plans for its turnaround maintenance.

3. Average selling price of Ethanol product was similar to levels attained in the previous quarter. However due to the declined in amount of Ethanol product volume sold, has caused this quarter to realize lower revenue by 12% QoQ.

4. Gross profit from the Ethanol business declined 22% QoQ, as a result from the amount of Ethanol product sold declining in conjunction with KGI's turnaround maintenance plan.

Performance comparison between 2019 and 2018.

1. Total production volume of Ethanol product was at 194.48 million liters, an increase of 30% YoY. By which KGI produced 147.64 million liters, an increase of 40% YoY due to the increase in the production capacity of the plant at the Bo Ploy district, Kanchanaburi province from 66 million liters per year to 99 million liters per year, and the plant at Nam Pong district, Khon Kaen province expanded from 45 million liters per year to 49.5 million liters per year.

Furthermore, BBE production volume was 46.84 million liters, an increase of 5% YoY, due to improvements made to the capabilities of the production process.

2. Total ethanol product sales volume was at 189.43 million liters, an increase of 27% YoY, primarily from increased sales volume by KGI following the capacity expansion which allowed it to accommodate the demand for Ethanol in Thailand which rose by 6% YoY (information provided by the Department of Energy Business) which corresponds with the trajectory of the consumption of Gasohol fuel that has been expanding with each passing year, and the increase in new car models that supports E20 and E85 Gasohol fuel with high Ethanol mixture.

3. Average selling price of Ethanol product declined from the previous year which adjusted following to the decreasing in raw material cost. Moreover, the amount of Ethanol produced into the market exceeded consumption demand, leading to high Ethanol stocks, and an Ethanol price competition occurred. However, the increased in sales volume has led to 2019 to earn more revenue from sales by 15% YoY.

4. Gross profit from Ethanol business increased 79% YoY due to declining in both raw material and processing cost of KGI, comparing to previous year. Moreover, BBE had the efficiency in raw material cost management.

5.) Natural Resources Business Group

Natural Resources Business Group Performance	Q4/2562	Q3/2562	QoQ	Q4/2561	YoY	2562	2561	YoY
EBITDA (THB Million)	(57)	(101)	44%	94	-161%	(36)	117	-131%
Share of Profit from OKEA (THB Million)	4	(88)	104%	(3)	N/A	26	(3)	N/A
Production Volume - Net to OKEA (KBD)	17.02	18.13	-6%	N/A	N/A	18.66	N/A	N/A
Net Sold Volume - Net to OKEA (KBD)	13.84	16.70	-17%	N/A	N/A	19.48	N/A	N/A

Performance of Natural Resources Business Group in Q4/2019 recorded an EBITDA loss of THB 57 million, an improvement of THB 44 million from Q3/2019, by the following operating factors

1. Realized increased share of profit from associated company OKEA

- Within this quarter sales of petroleum products proceeded under normal circumstances, with 1 cargo of crude oil from the Draugen field and natural gases coming via pipeline from the Gjoa field. Although profits from operations was on a downward direction within this quarter, but the business group realized gain from the depreciating US Dollar against Norwegian Krone (NOK). Furthermore, tax expenses also declined, leading OKEA to see improvements in its profit this quarter.
- This quarter recorded Technical Goodwill from the Gjoa Field due to gas prices fluctuating at low levels. (according to practices in Norway, a test on impairment of Technical Goodwill on investments in the Gjøa and Draugen field has to be carried out every quarters.)

2. Recorded a gain on foreign exchange forward contract at THB 24 million. Whereas, in the previous quarter the gain on foreign exchange forward contracts was THB 1 million.

Performance comparison between 2019 and 2018 of the Natural Resources Business Group recorded EBITDA decline of THB 153 million, by the following operating factors.

- In 2019, OKEA recorded production and sales within proximity of the plan. Whereas, rising in the exploration expenses, and realized loss from foreign exchange rate with the depreciating Norwegian

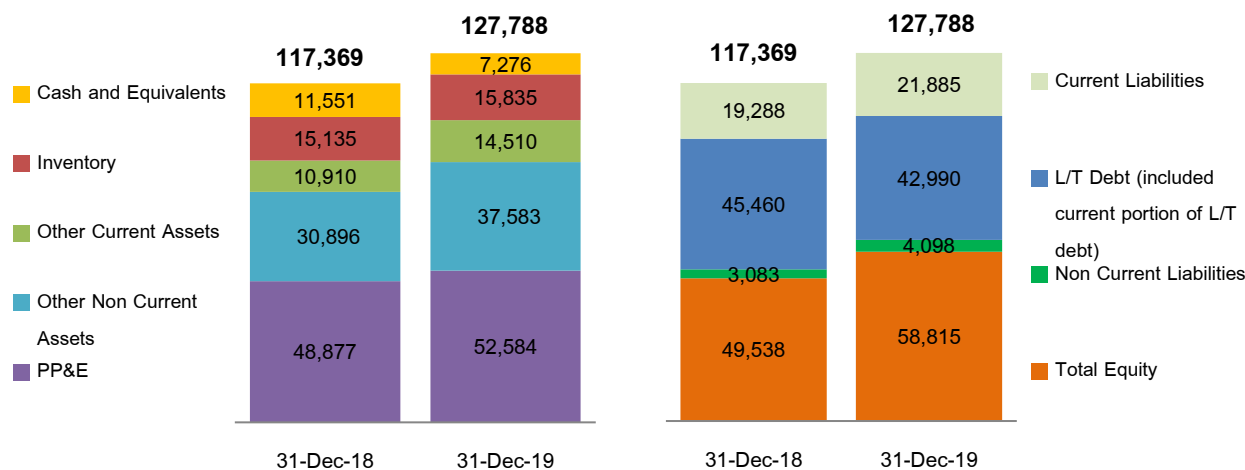
Krone (NOK). Also, there was an impairment loss on Technical Goodwill at Gjøa field, resulting in share of loss from operation of OKEA. However, gain from changes in investment interest were recorded THB 82 million from OKEA's initial public offering (IPO) of its shares, which affected share of profit from associated company OKEA at THB 26 million.

- The Natural Resources Business Group recorded gain on foreign exchange forward contract from THB 75 million to THB 118 million in 2019.
- In 2019, its performance was not realized revenue from Nido due to the divestment of Nido Production (Galoc) Pty. Ltd, which held the rights to the Galoc oil field, to Tamarind Galoc Pte.Ltd, and realized profit from divestment approximately THB 78 million. Then, the administrative expenses was mainly in the performance.

Statement of Financial Position

Financial Position of the Company and its subsidiaries (Consolidated)

Unit: THB million



Assets

As of 31st December 2019, the Company and its subsidiaries recorded Total Assets in the amount of THB 127,788 million, an increase of THB 10,419 million compared to 31 December 2018, changes in assets are as follows:

- Cash and cash equivalents decreased by THB 4,275 million. Details are stated in analysis of the Cash Flow Statement.
- Inventories increased by THB 700 million, mainly from the increase in the company's inventory stock of crude oil and finished product while the average cost of product is reduced and the company has the reversion of lower of cost or market (LCM) THB 689 million.
- Other current assets increased THB 3,599 million, mainly from:
 - Trade accounts receivable increased by THB 2,069 million, mainly increase in quantity and price of BCPT's finished product in December 2019.
 - Oil fuel fund subsidies receivable increased THB 907 million, due to the rise in sales volume and average compensation rate of B20
- Other non-current assets rose by THB 6,687 million, mainly due to:
 - Long term loan to related parties increased by THB 837 million, mostly from long term loan to LAC, according to contractual obligations.
 - Other long term investments increased by THB 254 million, primarily from the Company's subsidiary BCP Innovation Pte. Ltd.'s investment in 5 additional Startup businesses for USD 11.5 million or approximately THB 357 million. Moreover, there was an additional investment in LAC of USD 0.5 million or approximately THB 17 million. While there was a decreasing adjustment in Fair value on available-for-sale investment (LAC) by THB 37 million. (Fair value on available-for-sale investment (LAC) rose THB 5 million, and the effect of exchange rate decreased by THB 42 million). LAC share price increased from CAD 4.31 as of 31st December 2018 to CAD 4.16 as of 31st December 2019.

- Goodwill and intangible assets increased THB 318 million and THB 4,836 million, respectively. This was a result of BCPG Plc.'s investment in hydro power plant, Namsan 3A Power Sole Co.,Ltd, in Laos PDR by acquiring 100% shareholding in September 2019.
5. Property, plant and equipment net increased by THB 3,707 million. (Depreciation for the period was THB 4,478 million.) There were investments made chiefly in Efficiency, Energy, and Environment Enhancement Project (3E) and investments for equipment in preparation for the refinery's annual turnaround maintenance in 2020 in amount THB 5,800 million. Investment in power plant business (BCPG) both in Japan and Thailand of THB 1,478 million, and Bio-based products business of the BBGI group's additional investment of THB 1,101 million to expand the ethanol production plant's capacity and the construction of its refined glycerin plant.

Liabilities

As of 31st December 2019, the Company and its subsidiaries has Total Liabilities of THB 68,973 million, an increase of THB 1,142 million, changes in liabilities are as follows:

1. Current Liabilities increased by THB 2,597 million, mainly contributed by:
 - Trade Accounts Payable increased by THB 3,876 million, mainly from increase in crude purchase volume and price in December 2019 when compare with the previous year.
 - Excise tax and oil fuel fund payable decreased by THB 2,145 million because Excise Department change payment period of excise tax. The department has shifted the payment due to be sooner than prior year.
 - Long-term provisions increased by THB 733 million, from BCPG Plc's investment in hydro power plant in Laos PDR.
2. Long term loans from financial institutions and debentures (including current portion of long term debt) decreased by THB 2,470 million, comprised of debenture repayment at maturity by THB 4,000 million, loan repayment by THB 4,879 million, and the Company and its subsidiaries loan drawdown by THB 6,817 million. There was also adjustments for the effects of exchange differences on translating financial statement resulted in a gain of THB 408 million.
3. Other non-current liabilities increased by THB 1,015 million, mainly from the provisions for employee benefits from changes in principal actuarial assumptions, as well as the Labor Protection Act, which was amended on the 5th April 2019, requiring employers to increase remuneration to a terminated employee who had provided services for an uninterrupted period of twenty years or more to be entitled to severance valued at 400 days' worth of their final wage rate, and the liabilities on long-term lease

Equities

As of 31st December 2019, the Company and its subsidiaries' total equity was THB 58,815 million, increased by THB 9,277 million. The increment was mainly from the net profit for the year of THB 2,488 million, paid dividend by THB 1,760 million, effects from change in accounting policy resulting in a reduction of retained earnings by THB 54 million, while other comprehensive income decreased by THB 982 million (a result of differences in net fair value change in available for-sale investment (LAC) which increased by THB 5 million, translating financial statement, comprehensive income of associates, and principal actuarial assumptions which decreased by THB 987 million). Moreover, in 2019, there was an issuance of subordinated perpetual debenture net of THB 9,941 million, and treasury stock of THB 432 million. Total equity attributable to owners of the parent was THB 51,604 million, and book value per share (exclude subordinated perpetual debenture) was THB 30.26.

Cash Flows Statement of the Company and its subsidiaries (Consolidated)

As of 31st December 2019, the Company and its subsidiaries recorded net cash from operating activities of THB 6,749 million, net cash used in investing activities of THB 14,554 million, net cash from financing activities of THB 3,712 million, and decrease from the effect of exchange rate changes on cash and cash equivalents in the amount of THB 182 million. As a result, net cash and cash equivalents decreased by THB 4,275 million. There was cash in the amount of THB 11,551 million as of 1st January 2019, resulting in remaining cash as of 31st December 2019 to be recorded at THB 7,276 million. Details for each activity are as follows:

Cash Flows (Unit: Million Baht)	2019	2018
Net cash from (used in) operating activities	6,749	5,950
Net cash from (used in) investing activities	(14,554)	(9,100)
Net cash from (used in) financing activities	3,712	4,725
Effect of exchange rate changes on cash and cash equivalents	(182)	(131)
Net increase (decrease) in cash and cash equivalents	(4,275)	1,445
Cash and cash equivalents as at 1 January	11,551	10,106
Cash and cash equivalents as at 31 December	7,276	11,551

Details of cash received and used are as follows:

- Net cash from operating activities in the amount of THB 6,749 million, mainly attributed to:
 - Cash received from operating activities was THB 8,899 million, which was generated from net profit of THB 2,488 million, added back non-cash expenses of THB 4,642 million, added back finance costs and income tax expense of THB 1,769 million.
 - Net cash used for operating assets and liabilities of THB 1,623 million, mainly from (1) trade accounts receivable increased by THB 2,198 million (2) other receivables increased by THB 1,267 million (3) inventory increased by THB 35 million (4) other non-current assets increased by THB 105 million. (5) trade accounts payable increased by THB 4,077 million (6) other payables and other liabilities decreased by THB 2,096 million.
 - Corporate income tax paid was THB 527 million.
- Net Cash used in investing activities of THB 14,554 million, mainly from:
 - Cash received from interest in the amount of THB 124 million.
 - Cash paid for investment in subsidiaries companies, associated companies and other investments of THB 5,506 million. Comprised of increasing in share of BCP Innovation Pte., Ltd. for invest in startup, BCPR increased its investment in OKEA's initial public offering (IPO) of its ordinary shares and BCPG's acquisition of Hydro power plant in Laos PDR.

- Cash paid for investment in Property, Plant and Equipment was THB 7,835 million. Mostly are asset under construction on the Efficiency, Energy, and Environment Enhancement Project (3E), investment for equipment in preparation for the refinery's annual turnaround maintenance in 2020, power plant business, and bio-based product business.
 - Cash paid for loan to related parties was THB 873 million, mainly comprised of loans to LAC, under contractual obligation.
 - Cash paid for the leasehold right and Intangible assets by THB 655 million.
3. Net cash from financing activities was THB 3,712 million, mainly from:
- Cash paid as finance cost in the amount of THB 2,073 million.
 - Dividend payment was THB 1,760 million, comprising of the Company's at THB 1,377 million, BCPG Plc.'s dividend payment to non-controlling interests in the amount of THB 383 million.
 - Cash paid for debenture repayments at maturity THB 4,000 million.
 - Cash received from subordinated perpetual debenture THB 10,000 million.
 - Cash paid for treasury shares THB 432 million.
 - Cash received from long term loans from financial institution amounted to THB 6,817 million.
 - Repayment of long-term loans from financial institutions THB 4,879 million.

Financial Ratios

Financial Ratios (Consolidated)

Profitability Ratios (%)	Q4/2019	Q3/2019	Q4/2018	2019	2018
Gross Profit Margin	6.02%	5.26%	0.87%	5.37%	5.95%
EBITDA Margin	4.83%	4.61%	-0.65%	4.57%	5.31%
Net Profit Margin	1.73%	1.19%	-3.02%	1.31%	1.68%
Return on Equity ^{1/} (ROE)	4.10%	-1.00%	5.59%		
Return on Assets (ROA)	3.47%	1.14%	4.56%		

1/ Profit and Total equity attributable to owners of the parent

	31 Dec 19	30 Sep 19	31 Dec 18
Liquidity Ratios (Times)			
Current Ratio	1.39	1.19	1.47
Quick Ratio	0.69	0.57	0.80
Financial Policy Ratios (Times)			
Interest Bearing Debt to Equity	0.82	1.08	1.02
Net Interest Bearing Debt to Equity	0.69	0.94	0.78
	Q4/2019	Q3/2019	Q4/2018
DSCR ^{2/} (Times)	2.10	1.50	1.77

2/ DSCR Calculation is not including long term debt prepayment

Financial Ratios Calculation

▪ Gross Profit Margin	=	Gross Profit / Revenue from sale of goods and rendering of services
▪ EBITDA Margin (%)	=	EBITDA / Revenue from sale of goods and rendering of services
▪ Profit Margin (%)	=	Profit attributable to owners of the parent / Revenue from sale of goods and rendering of services
▪ Return on Equity (%)	=	Profit attributable to owners of the parent (Yearly) / Total Equity attributable to owners of the parent (Average)
▪ Return on Assets (%)	=	EBIT (Yearly) / Total Asset (Average)
▪ Current Ratio (times)	=	Current Asset / Current Liabilities
▪ Quick Ratio (times)	=	(Cash & Equivalents + Short term investments + Trade Account Receivable) / Current Liabilities
▪ Interest bearing Debt to Equity (times)	=	Interest bearing Debt / Total equity
▪ Net Interest bearing Debt to Equity	=	(Interest bearing Debt – Cash and cash equivalents – Current investments) / Total equity
▪ DSCR	=	EBITDA (Yearly) / (Paid for long-term debt + Finance cost)

Note:

1/ Average Total Equity attributable to owners of the parent

Yearly = (Total Equity attributable to owners of the parent of the year before + Total Equity attributable to owners of the Company of this year) / 2

Quarterly = (Total Equity attributable to owners of the parent of the quarter of the year before + Total Equity attributable to owners of the parent of the quarter this year) / 2

2/ Average Total Assets

Yearly = (Total Assets of the year before + Total Assets of the Company of this year) / 2

Quarterly = (Total Assets of the Company of the quarter of the year before + Total Assets of the Company the quarter this year) / 2

3/ The numerator of ROE is defined as the Profit attributable to owners of the parent and have to be annualized.

4/ The numerator of ROA is defined as EBIT and have to be annualized.

5/ Interest Bearing Debt defined as Short-term loans + Long-term loans (including current portion of long-term loans) + Debentures (including current portion of long-term debentures) + Finance lease liabilities (including current portion of finance lease liabilities)

Environment Management Accounting (EMA)

Having the environmental concerns and social responsibilities, the Company has prepared the environmental management accounting report to publish in sustainability report since 2005, aiming to enable the benefit of its usage for other organizations as well as for the Company. The environmental cost accounting helps the Company to keep track with the information which is useful for enhancing the environmental management effectiveness and resource utilization.

The Environmental Cost Accounting report covers refinery business unit, Bangchak and Bang Pa-in Oil distribution Centre.

(Unit: Million Baht)

Environment Management Accounting : EMA	2019	2018	Δ
Material Costs of Product Outputs			
: Crude oil, ethanol, biodiesel, chemical, energy and utilities in production	103,177.73	103,551.72	(373.98)
Material Costs of Non-Product Outputs			
: Consist of slop and sludge oil, waste water, chemical surplus	68.64	111.94	(43.29)
Waste and Emission Control Costs			
: Maintenance cost of environmental control equipment and depreciation and other fees	340.36	315.48	24.89
Prevention and Other Environmental Management Costs			
: Monitoring and measurement cost, environmental management system expenses	16.86	9.38	7.49
Total Expenses	103,603.59	103,988.52	(384.90)
Benefit from by-product and waste recycling (Negative number means revenue)	(18.36)	(15.62)	(2.75)

Total environmental cost in 2019 decreased from 2018 by approximately THB 384.90 million (-37% YoY) mainly due to Material Cost of Product Output which was lower by THB 373.98 million, with respect to the crude cost which declined by 11% from last year. Although, the Company's crude run rose from 102.39 KBD in 2018 to 112.62 KBD in 2019. Material Costs of Non-Product Outputs was lower by THB 43.29 million, in accordance with the fall in products that were below quality standard.

Waste and Emission Control Costs along with Prevention and Other Environmental Management Costs increased by THB 32.37 million (+10% YoY), primarily from depreciation of the pollution control equipment increased by THB 33.73 million, monitoring and measurement cost increased by THB 7.26 million, and effluent treatment cost increased by THB 2.08 million. On the other hand, environmental equipment maintenance cost and waste disposal cost decreased by THB 4.00 million, and THB 6.92 million, respectively.

Benefits from by-products and waste recycling increased by THB 2.75 Million (+18% YoY), mostly due to amount of sellable liquid sulfur which increased.

Air quality from the refinery's flue

To monitor the environment, the Company has been constantly measuring air quality emitted from the refinery's various flues, to which the amount of pollutant such as dust, nitrogen oxide, and sulfur dioxide emitted is far below the required standard set by the Thai Ministry of Industry.



Management's Perspective towards 2020 Performance

2020 Economic Situation Perspective

According to the World Economic Outlook reported by the International Monetary Fund (IMF) published in January 2020, projects the global economy in 2020 to expand at the rate of 3.3%, an increase from the estimated growth 2.9% in 2019. Recovery is likely from the deals reached from the first round of negotiations of the trade war between the US and China. As well as the relief in pressure from the No-Deal BREXIT situation. However, there are persisting negative factors from geopolitics, and especially, the outbreak of the new strain of the Corona virus (COVID-19) in China at the beginning of this year; being the world's second largest economy. The virus is still spreading to various countries and regions around the world, of which would make the recovery of the global economy not proceed as expected by the IMF.

The economy of the Asia Pacific region is still continuously expanding at a decreasing rate, due to the influence of the trade war, an outbreak of a virus, as well as the prolonged demonstration in Hong Kong; leading to economic contraction. The Chinese economy expanded at a slow pace due to the outbreak and the trade embargo that affected domestic consumption and its export sector, mainly. As for member countries of the ASEAN, they are expected to remain on par with the previous year. However, the recovery of global trade volume will have to confront various aforementioned risk factors.

Crude Oil Price and Crack spread situation

The International Energy Agency (IEA) estimated that global demand for crude oil will grow by 1.2 million barrels per day in 2020 compared to the 1.0 million barrels per day growth in 2019, coinciding with assessments from the International Monetary Fund (IMF) in regards to global economic growth exceeding the previous year. Asia would remain the central region to support the growth of global oil demand. Especially, China and India, although still affected by the trade war between the US and China, witnessing slowdowns in industrial activities, but the policies to invest in basic national infrastructure still drives demand to grow. As for oil production from non-OPEC members, there is a propensity for supplies to increase by 2.1 million barrels per day in 2020 compared to 2019; mainly from the increasing of US production, which is estimated to increase by 1.1 million barrels per day in 2020. With respect to the new crude oil pipeline and new infrastructure which has commenced full operation, resulting in US Shale Oil production to increase continuously. Moreover, the technological capabilities for production has progressed to the point where it enables the US to have low production cost, allowing them to still produce oil even with low price level. The aforementioned factors may lead the global oil market to be accosted by a state of excess supply. Assessment of Dubai crude price for 2020, the price will be moving within the 55-65 \$/BBL range. Crude oil price will be under pressure from lagging oil demand due to concerns over receding economies, stemming from the trade war between the US and China, in conjunction with the outbreak of the new strain of the Corona virus that may continue to spread in China; being the world's second largest consumer of oil. The outbreak of this virus may affect tourism and oil demand. Whereas, supply has a tendency to increase from non-OPEC members, especially supplies of crude oil from the US. However, oil price is still supported by the conflict between Iran and the US, which has caused unrest within the Middle East, consisting of countries that are the major producers of crude oil. Meanwhile, OPEC members and their allies are still collaborating to lower production in order to stabilize oil price.

Dated Brent and Dubai spread (DTD/DB) is expected to average between 0.0-0.2 \$/BBL with support from demand for Light crude oil with low Sulphur within regions that are expected to have demand growth in order to produce fuel for the bunker oil with low Sulphur content – enforcement of fuel usage would be enacted on the 1st January 2020.

However, Brent crude is still under pressure from supplies of Light crude that has returned to a state of market excess, especially supplies of crude oil from the US, with tendencies of supplies to further increase.

As for the gross refining margin (GRM) in 2020, it is estimated that the GRM of Dubai crude for Hydrocracking refineries in Singapore is expected to slightly decrease from 2019. It is expected that supplies of finished product in Asia will decelerate due to concerns about the state of the economy, since the trade war between the US and China have persisted, even with progress towards dispute resolutions in the trade. Furthermore, the outbreak of the new strain of the Corona virus may have detrimental effects on tourism and oil demand. However, the change in specification for the bunker oil with Sulphur content not exceeding 0.5% may become a supporting factor for GRM in Asia to increase.