



PTT Global Chemical Public Company Limited
Management Discussion and Analysis Q2/2019



MEMBER OF
Dow Jones
Sustainability Indices
In Collaboration with RobecoSAM



WORLD MEMBERS IN CHEMICALS SECTOR
FOR 6th CONSECUTIVE YEAR

Executive Summary

In Q2/2019, PTT Global Chemical Public Company Limited (“the Company”) had sales revenue of Baht 106,748 million, decreased by 5% from Q1/2019 and by 17% from Q2/2018, with operating profit (excluding Stock gain, Net Realizable Value, and realized on new regulation about employee benefit under Labor Protection Act) at Baht 4,388 million, decreasing by 13% from Q1/2019 and by 47% from Q2/2018, resulted from soften overall products price driven by the decline in Dubai crude oil price, slowdown in global economic impacted from the trade war between the United States and China and sale volume decrease from planned maintenance shutdown of Aromatics Plants I in this quarter. These factors impacted to the decreasing in Olefins and Derivatives price, Aromatics products spread, and Refinery product spread. By including other items such as stock gain with net realizable value, and realized on new regulation about employee benefit under Labor Protection Act Baht 784 million (Net Deferred income tax) in May 2019, net profit for Q2/2019 reported at Baht 2,202 million (0.49 Baht/Share) decreased from Q1/2019 and Q2/2018 by 66% and 80% respectively.

Even though Diesel spread declined, Refinery business had an increased gross refinery margin (GRM) at 3.46 USD per barrel due to increase in by-product spread in Naphtha and Reformate. For Aromatics business, even there was supportive factors from high operating rate of downstream products, concerning about new supply in the region in the second half of this year has put the pressure on Aromatics price and consequently reflected to lower products spread which BTX P2F recorded at 75 USD per ton. For Olefins and Derivatives business, Polyethylene price was pressured by the trade war between United States and China while Ethylene Oxide had improvement from fully operates after maintenance shutdown. Hence, the adjusted EBITDA margin of Olefins & derivatives remained at 18% in this period. The company adjusted EBITDA in Q2/2019 was Baht 7,582 million, decreased by 22% from Q1/2019 and by 52% from Q2/2018. Beside these, Share of Profit from Investments (attributable to Owners of the Company) was Baht 1,283 million, increased by 8% from Q1/2019, mainly from improvement of Polypropylene business. In this period, the company realized foreign exchange gain by Baht 692 million from appreciation of Thai baht, however, due to the fluctuation in Dubai crude oil price and product spread, the company had loss from Stock gain net NRV of Baht 1,402 million. The company recorded Net profit for Q2/2019 at Baht 2,202 million, decreasing 66% from Q1/2019 and 80% from Q2/2018.

Table 1 : Performance Summary

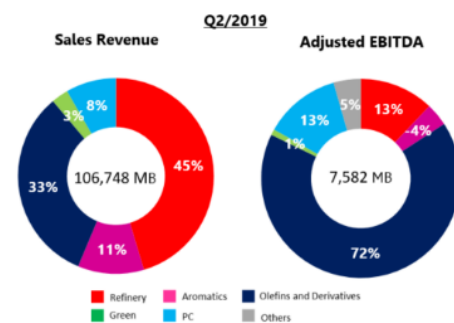
(Unit: Million Baht)	Q2/2018	Q1/2019	Q2/2019	YoY % +/-	QoQ % +/-	6M/2018	6M/2019	YoY % +/-
Sales Revenue	128,923	112,783	106,748	-17%	-5%	249,862	219,531	-12%
EBITDA	18,574	11,194	5,195	-72%	-54%	34,883	16,389	-53%
EBITDA Margin (%)	14%	10%	5%	-9%	-5%	14%	7%	-7%
Share of profit of investments in JV and Associates	1,515	1,186	1,283	-15%	8%	3,540	2,469	-30%
Net Profit	10,828	6,443	2,202	-80%	-66%	23,215	8,645	-63%
EPS (Baht/Share)	2.40	1.43	0.49	-80%	-66%	5.15	1.92	-63%
Adjusted EBITDA*	15,902	9,768	7,582	-52%	-22%	32,221	17,350	-46%
Adjusted EBITDA Margin (%)	12%	9%	7%	-5%	-2%	13%	8%	-5%

Note: * Adjusted EBITDA refers EBITDA excluding Stock gain/(loss), NRV and Extra item

Table 2 : Adjusted EBITDA Margin

% Adj. EBITDA Margin	Q2/2018	Q1/2019	Q2/2019	6M/2018	6M/2019
Business Unit :					
Refinery	5	2	2	5	2
Aromatics	3	8	(2)	4	4
Olefins and Derivative*	29	18	18	30	18
Green	3	4	3	4	3
Performance Materials and Chemicals	17	15	11	16	13
Average	12	9	7	13	8

Note: *If included PTA, PET %Adj. EBITDA Margin Q1/19 is 15%, Q2/19 is 16%, and 6M/19 is 15% respectively



Performance Analysis by Business Unit

Refinery Business Unit

Table 3 : Crude Price & Petroleum Product Spreads

(Unit: USD per bbl)	Q2/2018	Q1/2019	Q2/2019	YoY % +/-	QoQ % +/-	6M/2018	6M/2019	YoY % +/-
Dubai Crude Oil	72.09	63.53	67.36	-7%	6%	67.99	65.44	-4%
Gasoline-Dubai	12.12	3.70	7.51	-38%	103%	12.92	5.61	-57%
Jet-Dubai	15.25	12.97	12.21	-20%	-6%	15.68	12.59	-20%
Diesel-Dubai	14.61	12.79	12.37	-15%	-3%	14.68	12.58	-14%
Fuel Oil-Dubai	-4.46	0.52	-2.33	48%	<-200%	-4.71	-0.90	-81%

Dubai crude oil market in Q2/2019 fluctuated respectively from the trade war conflict between the United States and China and expected world economic slowdown. As a result, Dubai crude oil prices adjusted upward by 6% from last quarter but downward by 7% from Q2/2018. The price gradually increased at the end of Q2/2019 followed by an extended petroleum production cut period to 9 months until March 2020 among petroleum producers from both OPEC and non-OPEC members. Additionally, with the United States sanctions against Iran and the political unrest in Middle East, especially Strait of Hormuz situation impacted crude oil transportation in this region, these factors had contributed toward average Dubai crude oil price in this quarter at 67.36 USD per barrel and ending price at 64.89 USD per barrel

The average Jet over Dubai crude oil spread, and the average Diesel over Dubai crude oil spread were 12.21 and 12.37 USD per barrel respectively, decreased from Q1/2019 driven by the expectation of world economic slowdown, and more export quota from China suppressed these petroleum productions spreads. The average Fuel oil over Dubai crude oil spread was -2.33 USD per barrel, decreased from last quarter because of increasing export from the Middle East and the sanction on Venezuela which led higher export volume into Asia.

Table 4 : Gross Refinery Margin

(Unit: USD per bbl)	Q2/2018	Q1/2019	Q2/2019	YoY % +/-	QoQ % +/-	6M/2018	6M/2019	YoY % +/-
Market GRM	6.20	3.22	3.46	-44%	8%	6.18	3.33	-46%
CDU GRM	6.65	2.96	3.18	-52%	7%	6.56	3.06	-53%
CRS GRM	4.40	4.48	5.05	15%	13%	4.56	4.78	5%
Hedging Gain/(Loss)	0.08	-0.11	0.38	>200%	>200%	-0.01	0.12	>200%
Stock Gain/(Loss) Net NRV	3.26	2.73	-1.75	-154%	-164%	1.65	0.60	-64%
Accounting GRM	<i>9.54</i>	<i>5.84</i>	<i>2.09</i>	<i>-78%</i>	<i>-64%</i>	<i>7.82</i>	<i>4.05</i>	<i>-48%</i>
Adjusted EBITDA (MB)	2,594	949	989	-62%	4%	5,116	1,937	-62%
Adjusted EBITDA (%)	5%	2%	2%	-3%	0%	5%	2%	-3%
Utilization Rate	101%	102%	94%	-7%	-8%	102%	98%	-4%

In Q2/2019, Refinery Business had utilization rate at 94% slightly decrease from Q1/2019 and Q2/2018. The major petroleum products spread over Dubai crude oil price had been decreased from Q1/2019 and Q2/2018. Market GRM in this period was 3.46 USD per barrel. In addition, according to the fluctuation in Dubai crude oil price which decreased in June 2019 compared to March 2019, the company realized loss from stock gain net realizable value at 1.75 USD per barrel while had hedging gain at 0.38 USD per barrel. These resulted in Refinery business accounting GRM of 2.09 USD per barrel, decreased from Q1/2019 and Q2/2018 at 5.84 and 9.54 USD per barrel. In this quarter, Refinery

business had adjusted EBITDA of Baht 989 million and Adjusted EBITDA Margin at 2%, stable as previous quarter.

Aromatics Business Unit

Table 5 : Aromatics Product Prices and Spreads over Condensate

(Unit: USD per ton)	Q2/2018	Q1/2019	Q2/2019	YoY % +/-	QoQ % +/-	6M/2018	6M/2019	YoY % +/-
Condensate	630	535	573	-9%	7%	601	554	-8%
Paraxylene (TW)	984	1,080	909	-8%	-16%	974	994	2%
Paraxylene(TW)-Condensate	353	545	336	-5%	-38%	372	441	18%
Paraxylene (FECF)	984	1,054	914	-7%	-13%	969	984	2%
Paraxylene(FECF)-Condensate	354	519	341	-4%	-34%	368	430	17%
Benzene (Spot Korea)	842	590	625	-26%	6%	866	607	-30%
Benzene-Condensate	212	55	52	-75%	-4%	265	54	-80%
Naphtha-Condensate	11	-16	-32	<-200%	-106%	9	-24	<-200%

Paraxylene (PX)

In Q2/2019, Paraxylene (FECF) spread over Condensate price declined 34% from Q1/2019 and 4% from Q2/2018 to the average at 341 USD per ton, pressured by new capacities from China and increasing Condensate price in line with the crude oil price trend. However, Paraxylene market was continuously supported by a favorable demand from downstream business such as Purified Terephthalic Acid (PTA) and Polyester's high utilization rate, and lower supply from maintenance shutdown of major producers in the region.

Benzene (BZ)

In Q2/2019, Benzene spread over Condensate price was steady from previous quarter at the average of 52 USD per ton but declined by 75% from Q2/2018. Benzene market was supported by lower supply from maintenance shutdown of major Aromatic plants in Asia and strong demand from downstream product Styrene monomer. Furthermore, arbitrage window for exporters in Asia to North America helped Benzene market in the region to be more balanced even some pressure existed from sluggish demand in Phenol business which led by maintenance shutdown in downstream product, and trade war conflict between the United States and China.

Table 6 : Aromatics market P2F

(Unit: USD per ton)	Q2/2018	Q1/2019	Q2/2019	YoY % +/-	QoQ % +/-	6M/2018	6M/2019	YoY % +/-
Market P2F	130	206	75	-42%	-64%	147	147	0%
Hedging Gain/(Loss)	10.3	-10.6	13.6	32%	>200%	5.4	0.3	-95%
Stock Gain/(Loss) net NRV	48.5	1.9	-41.0	-184%	<-200%	25.2	-0.05	-100%
Accounting P2F	188	197	47	-75%	-76%	178	147	-17%
Adjusted EBITDA (MB)	714	1,481	-305	-143%	-121%	1,839	1,176	-36%
Adjusted EBITDA (%)	3%	8%	-2%	-5%	-10%	4%	4%	0%
Utilization Rate (%)	94%	94%	72%	-22%	-22%	92%	83%	-9%

BTX utilization rate in Q2/2019 was 72%, lower than 1/2019 and Q2/2018 due to planned maintenance shutdown to improve the production efficiency in Aromatics plant I in May and June 2019 for 53 days. Paraxylene spread over condensate price decrease to 341 USD per ton while Benzene spread over condensate price remained constant from the previous quarter at 52 USD per

ton, which resulted in lower Market P2F per ton BTX to 75 USD per ton, a decrease of 64% from Q1/2019 and 42% from Q2/2018, with Adjusted EBITDA of Baht -305 million and Adjusted EBITDA Margin at -2%. However, by considering the performance of Phenol business which is one of major downstream products, Aromatics business could maintain its capability to generate the margin. In addition, in this period, the company had realized loss from stock gain net realizable value at 41 USD per ton and realized hedging gain at 13.6 USD per ton, resulted in Accounting P2F of 47 USD per ton.

Olefins and Derivatives Business Unit

Table 7 : Prices and Spreads of Olefins and Derivatives

(Unit: USD per ton)	Q2/2018	Q1/2019	Q2/2019	YoY % +/(-)	QoQ % +/(-)	6M/2018	6M/2019	YoY % +/(-)
Naphtha (MOPJ)	641	519	541	-16%	4%	611	530	-13%
Ethylene (SEA)	1,222	928	824	-33%	-11%	1,232	876	-29%
Propylene (SEA)	1,003	839	796	-21%	-5%	995	817	-18%
HDPE	1,384	1,093	1,080	-22%	-1%	1,382	1,086	-21%
HDPE-Naphtha	743	573	539	-27%	-6%	771	556	-28%
LLDPE	1,214	1,037	1,017	-16%	-2%	1,227	1,027	-16%
LLDPE- Naphtha	573	518	476	-17%	-8%	617	497	-19%
LDPE	1,252	1,046	1,067	-15%	2%	1,263	1,056	-16%
LDPE- Naphtha	611	526	527	-14%	0%	653	527	-19%
PP	1,301	1,127	1,143	-12%	1%	1,286	1,135	-12%
PP-Naphtha	660	608	602	-9%	-1%	675	605	-10%
MEG (ACP)	1,147	833	773	-33%	-7%	1,144	803	-30%
MEG-0.65 Ethylene	353	230	237	-33%	3%	343	234	-32%

In Q2/2019, averaged HDPE price was at 1,080 USD per ton, slightly decreased by 1% from Q1/2019 and by 22% from Q2/2018, while LLDPE price also moved downward but LDPE price slightly rose. Polyethylene price was still under pressure by concern over the impact of continuous trade war between the United States and China which has not reached the final agreement and expected world economic slowdown. For MEG (ACP) in Q2/2019, the price continued its declining and decrease by 7% from Q1/2019 and by 33% from Q2/2018 caused by trade war and new supply into the market. However, with high demand and utilization rate in downstream business such as Polyester and PET (Polyethylene terephthalate), it is expected that the price will recover in the second half of this year.

Table 8 : Adjusted EBITDA of Olefins and Derivatives

(Unit: Million Baht)	Q2/2018	Q1/2019	Q2/2019	YoY % +/(-)	QoQ % +/(-)	6M/2018	6M/2019	YoY % +/(-)
Adjusted EBITDA (MB)	10,202	5,389	5,442	-47%	1%	20,728	10,831	-48%
Adjusted EBITDA (%)	29%	18%*	18%*	-11%	0%	30%	18%*	-40%
Utilization Rate Olefins (%)	104%	101%	104%	0%	3%	102%	103%	1%
Utilization Rate Polymer (%)	107%	100%	101%	-6%	1%	106%	100%	-6%
Utilization Rate MEG (%)	91%	69%	108%	18%	39%	101%	89%	-12%

Note: *If included PTA, PET %Adj. EBITDA Margin Q1/19 is 15%, Q2/19 is 16%, and 6M/19 is 15% respectively

In Q2/2019, Olefins plants had average utilization rate of 104%, improved from Q1/2019 but unchanged from Q2/2018, while Polymer plants had a utilization rate of 101%, improved from Q1/2019 but decreased from Q2/2018. While MEG business had 108% utilization rate since there was no maintenance shutdown in this period, compared to 69% in Q1/2019 and 91% in Q2/2018 that planned maintenance shutdown took place for 43 days and 12 days respectively.

The polyethylene price decreased from Q1/2019 and Q2/2018 while sales volume slightly declined from previous quarter due to slowing market condition, but increased from the same period of previous year. However, for MEG business, even the price was soften compared with previous quarter, the performance was improved led by fully utilization rate after completion of planned turnaround, but soften than Q2/2018 due to lower product spread.

In this period, Olefins and Derivatives business had Adjusted EBITDA of Baht 5,442 million, increased from Q1/2019 by 1%, but decreased from Q2/2018 by 47% accounted for Adjusted EBITDA margin at 18%. In addition, Olefins feedstock consuming in this quarter was 89% of gas and 11% of Naphtha, improved from last quarter which consumed lower gas as a result of lower supply impacted by reducing of gas production in the Gulf of Thailand due to the tropical storm.

Table 9 : Adjusted EBITDA

Adjusted EBITDA (MB)	Q2/2018	Q1/2019	Q2/2019	YoY % +/-	QoQ % +/-	6M/2018	6M/2019	YoY % +/-
Business Unit :								
Refinery	2,594	949	989	-62%	4%	5,116	1,937	-62%
Aromatics	714	1,481	-305	-143%	-121%	1,839	1,176	-36%
Olefins and Derivative	10,202	5,389	5,442	-47%	1%	20,728	10,831	-48%
Green	128	110	77	-40%	-30%	334	187	-44%
Performance Materials and Chemicals	1,936	1,532	1,017	-47%	-34%	3,690	2,549	-31%
Services and Others	329	307	362	10%	18%	516	669	30%
Adjusted EBITDA (MB)	15,902	9,768	7,582	-52%	-22%	32,221	17,350	-46%

Note:

* Adjusted EBITDA refers EBITDA excluding Stock gain/(loss), NRV and Extra item

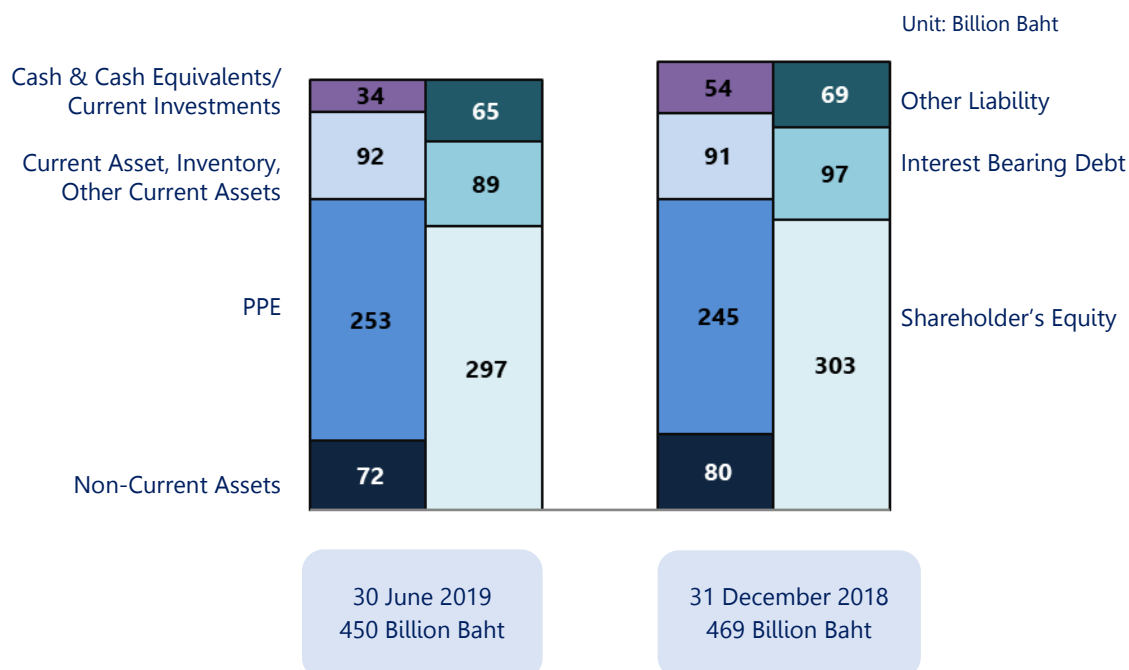
Operating Performance

Unit : MB		Q2/2018	Q1/2019	Q2/2019	YoY % + /(-)	QoQ % + /(-)	6M/2018	6M2019	YoY % + /(-)
	Sales Revenue	128,923	112,783	106,748	-17%	-5%	249,862	219,531	-12%
	Feedstock cost	(100,245)	(89,178)	(85,491)	-15%	-4%	(192,364)	(174,669)	-9%
	Product to Feed Margin	28,678	23,605	21,257	-26%	-10%	57,498	44,862	-22%
1	Variable Cost	(6,980)	(7,459)	(7,345)	5%	-2%	(13,754)	(14,805)	8%
2	Fixed OH	(3,980)	(3,914)	(4,710)	18%	20%	(7,703)	(8,624)	12%
3	Stock Gain/(Loss) and NRV	2,672	1,426	(1,402)	-152%	-198%	2,662	23	-99%
4	Gain/(Loss) on Hedging Commodity	236	(244)	386	64%	>200%	180	142	-21%
5	Other Revenue	1,035	1,106	894	-14%	-19%	2,027	2,000	-1%
6	SG&A Expenses	(3,087)	(3,326)	(3,885)	26%	17%	(6,027)	(7,210)	20%
	EBITDA	18,574	11,194	5,195	-72%	-54%	34,883	16,389	-53%
7	Depreciation & Amortization	(4,729)	(5,011)	(4,668)	-1%	-7%	(9,431)	(9,679)	3%
8	Loss from GGC's inventory**	(2,004)	2	14	-101%	<-200%	(2,004)	16	-101%
	EBIT	11,841	6,185	541	-95%	-91%	23,448	6,726	-71%
9	Net financial expense	(901)	(496)	(495)	-45%	0%	(1,404)	(992)	-29%
10	FX Gain(Loss)	(682)	438	692	>200%	58%	(13)	1,130	>200%
11	Share of gain/(loss) from investment	1,515	1,186	1,283	-15%	8%	3,540	2,469	-30%
12	Corporate Income Tax	(1,340)	(719)	376	-128%	-152%	(2,577)	(343)	-87%
13	Net Profit after Tax	10,433	6,594	2,397	-77%	-64%	22,994	8,990	-61%
	Profit/(loss) attributable to:						0	0	0%
14	Non-controlling interests	(395)	151	195	149%	29%	(221)	345	>200%
15	Owners of the Company	10,828	6,443	2,202	-80%	-66%	23,215	8,645	-63%
16	Adjusted EBITDA*	15,902	9,768	7,582	-52%	-22%	32,221	17,350	-46%

Note: * Adjusted EBITDA = EBITDA excluded Stock Gain/Loss, NRV and Extra item
 ** Effect from Inventory Loss per shareholding of 72.29% is 1,388 million baht

In term of the Operating performance, the company had lower sales revenue compare with Q1/2019 and Q2/2018 by 5% and 17% respectively mainly due to narrowing products spread led by concerning on trade war between the United States and China which negatively impacted on global economic slowdown and soften demand in the market, and planned maintenance shutdown of Aromatics Plant I. However, by excluding the realized on new regulation about employee benefit under Labor Protection Act of Baht 784 million (Net Deferred income tax), Fixed OH and SG&A remained at the same level as in Q1/2019 and Q2/2018. In addition, Share of profit from investment (attributable to Owners of the Company) decreased by 15% from Q2/2018 due to softening performance of Acrylonitrile (AN) business, however, financial expenses declined by 45% as a result of loan repayment to financial institutions and corporate bonds.

Statement of Financial Position



As of June 30, 2019, the company had Total Asset of Baht 450,099 million, decreased by Baht 19,156 million from December 31, 2018. Total current asset declined by Baht 18,973 million mainly due to decreasing in Cash and Cash Equivalents and Current Investments of Baht 19,854 million and decreasing in Account receivable of Baht 10,118 million, even an increasing in Inventory and other current assets of Baht 5,233 and 5,766 million respectively. In addition, total non-current asset dropped by Baht 184 million, mainly due to decreasing in other non-current asset by Baht 7,762 million as a result of decreasing in long term investment by Baht 4,153 million from selling investments in available for sale securities to support the company operation, even increasing in Property, plant and equipment of Baht 7,578 million. For this period, the Company had total Shareholders' Equity of Baht 296,675 million, decreased by Baht 6,807 million from 31 December 2018 due to dividend payment in the first half of this year and the company recognized the difference arising from the change in the ownership interest in investment according to GPSC Tender offer which made payment for shares of GLOW.

Cash and Cash Equivalents and Current Investments decreased by Baht 19,854 million from the end of last year. The company had cash flow from operation of Baht 19,480 million while cash flow used in investment activities was Baht 8,836 million, mainly invested for the purchasing of property, plant and equipment and intangible assets on the projects such as Olefins Reconfiguration, Propylene Oxide by GC Oxirane and Polyols & PU System by GC Polyols and short-term loan for GPSC of Baht 8,000 million. However, there was cash received from the sale of available-for-sale securities of Baht 10,344 million and cash received from the sale of current investments of Baht 5,490 million. The company's cash flow used in Financing activities of Baht 19,013 million which mainly used for dividend payment of Baht 11,540 million, interest payment to financial institutions and hire-purchase contracts totaling Baht 1,652 million, and repayment of short-term and long-term loans totaling Baht 5,821 million. Therefore, as of June 30, 2019 the Company had total Cash and Cash Equivalents of Baht 28,335 million, including short term investment of Baht 5,373 million and long-term investment managed by private fund and in-house amount Baht 2,473 million, the Company had totaling cash and cash equivalent and investment of Baht 36,181 million. Additionally, the Company reported net interest-bearing debt to equity was 0.19 times. Net interest-bearing debt to EBITDA was 1.39 times.

Key Financial Ratios

Financial Ratios	Q2/2018	Q1/2019	Q2/2019
Current Ratio (Times)	2.14	2.08	1.84
EBITDA to Sales Revenue (%)	14.26%	10.48%	8.20%
Net Profits to Sales Revenues (%)	9.03%	6.73%	5.26%
Return on Total Assets (%)	12.23%	8.85%	6.72%
Return on Equity (%)	15.70%	13.54%	8.84%
Interest Bearing Debt to Equity (Times)	0.32	0.31	0.30
Net Interest Bearing Debt to Equity (Times)	0.17	0.15	0.19
Net Interest Bearing Debt to EBITDA (Times)	0.75	0.85	1.39

Remarks :

Current Ratio	=	Current Assets divided by Current Liabilities
EBITDA to Sales Revenue*	=	EBITDA divided by Sales Revenue (Average 12 months)
Net Profit to Sales Revenue*	=	Profits attributable to Owners of the Company to Sales Revenue (Average 12 months)
Return on Total Assets	=	Earnings before Interest and Tax divided by Average Total Assets
Return on Equity	=	Profits attributable to Owners of the Company divided by Average Equity attributable to Owners of the Company
Interest Bearing Debt to Equity	=	Interest Bearing Debt divided by Shareholder's Equity
Net Interest Bearing Debt to Equity	=	Interest Bearing Debt net Cash and Cash Equivalent and Current Investments divided by Shareholder's Equity
Net Interest Bearing Debt to EBITDA	=	Interest Bearing Debt net Cash and Cash Equivalent and Current Investments divided by EBITDA

Market and Business Outlook in 2019

In the second half of 2019, the average Dubai crude oil price is expected to be 60-65 USD per barrel. The International Energy Agency (IEA) had estimated the crude oil demand in 2019 at 100.3 million barrels per day, increased by 1.2 million barrels per day. However, this is subject to uncertainties from the United States and China trade war which will impact the economic situation along with the concern on global economy which can pressure the oil demand. Although the OPEC petroleum producers and Russia are cooperating to restrain the petroleum production, the increasing production of shale oil in the United States can put pressure on the crude oil price

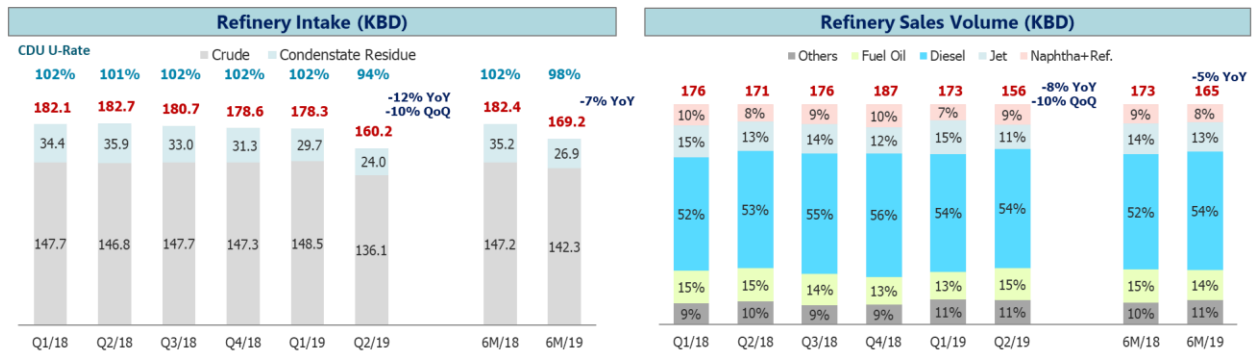
For Petroleum product in 2H/2019, the Company anticipates that Diesel spread over Dubai crude oil price will be averaged around 15.4–16.9 USD per barrel, contributing by International Marine Organization (IMO) regulation on limiting the Sulphur content in fuel oil used on board ships; it is expected that there will be more demand on Diesel for blending in order to comply for the Sulphur content. Fuel Oil spread and the Gasoline spread over Dubai crude oil price are expected to be -5.7 to 1.6 and 8.0-9.3 USD per barrel, respectively. The Fuel Oil will be affected by the IMO regulation and will imminently recognize the impact by 2H/2019 while Gasoline is still pressured by a high inventory level and increasing production in North America. As for Refinery's annual utilization rate, it will be operated around 84%, resulting from the planned maintenance shutdown in Q4/2019 for 2 months.

For Aromatics product in 2H/2019, Paraxylene spread over Naphtha price is expected to be 320 - 350 USD per ton. Despite the new supply from China, the demand from Fiber and Filament industries, Purified Terephthalic Acid (PTA), and PET bottle resin are expected to be the growth potential. For Benzene spread over Naphtha price, it is expected to be 150-170 USD per ton. Benzene demand is expected to increase from the higher demand of Styrene Monomer. As for Aromatics' annual utilization rate, it will be operated around 89% from the planned maintenance shutdown in Q2/2019 for 2 months for production efficiency improvement for Aromatics 1

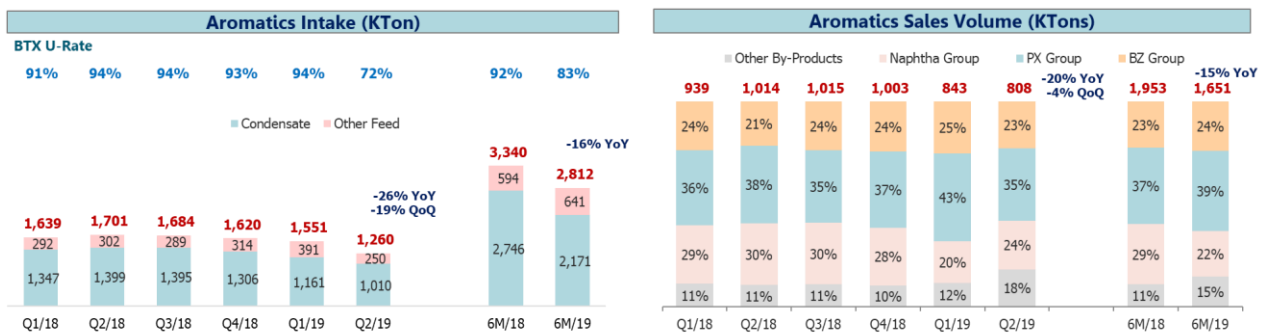
The outlook for Olefins and Derivatives product in 2H/2019 has a stronger potential in line with higher crude oil price. The product price depends on the resolution of the United States and China trade war which remains uncertain. More supply from the United States and SEA is also expected in this region which makes average HDPE price to be around 1,000-1,030 USD per ton. MEG outlook is expected to slightly increase from 1H/2019 despite new supplies from the United States, China, and SEA enter this region. It is still supported by the increasing demand from downstream businesses, particularly the Polyester in China. The Company expects the average MEG (ASP) price to be around 545-570 USD per ton. In 2019 Olefins plants utilization rate will be around 102% and Polymers plants will be around 103%.

Appendix

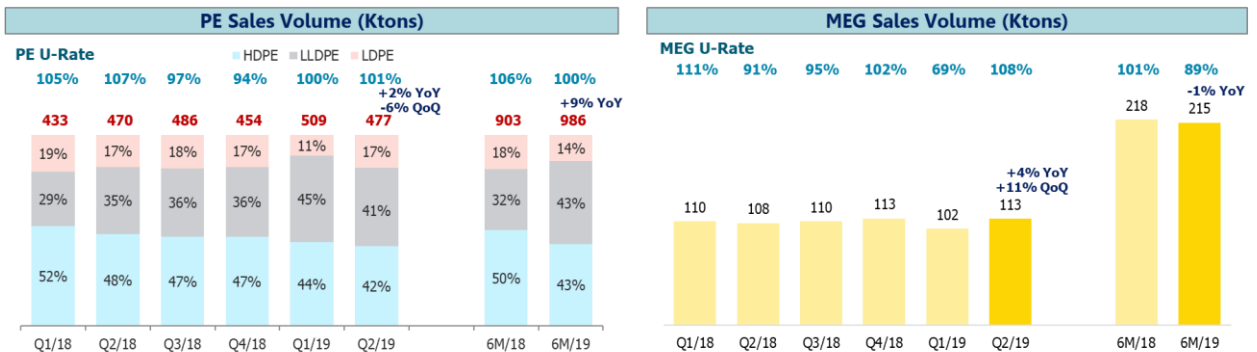
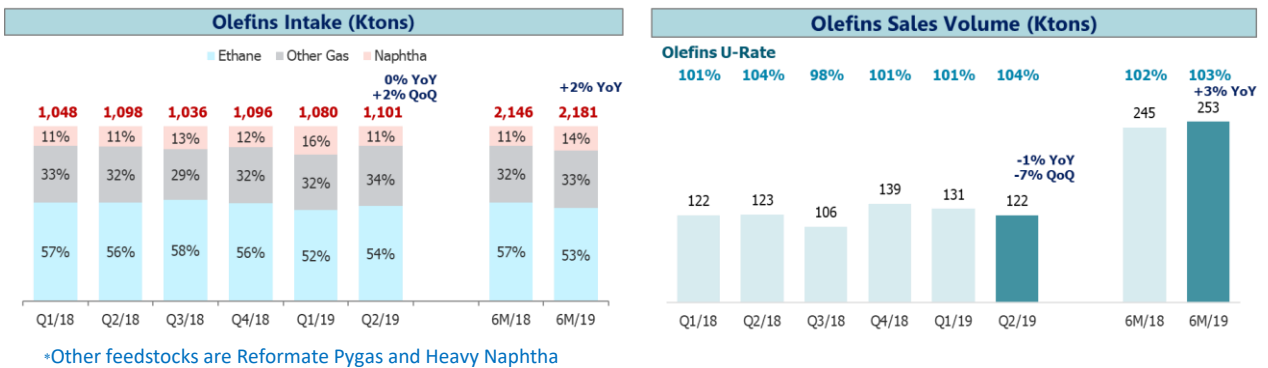
Graph 1: Refinery Intake and Sales Volume



Graph 2: Aromatics Intake and Sales Volume (BTX)



Graph 3: Olefins Intake and Olefins and Derivatives Sales Volume



Planned Maintenance Shutdown Schedule 2019

Plant		2019											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
OLE	Cracker												
POL	HDPE					20	HDPE2		20	HDPE1/1			
	LDPE		12								20		
	LLDPE I												
	LLDPE II												
	PS									15	GPPS		
									10	HIPS			
EOB	TOCGC		43										
PHN	Phenol I					22							
	Phenol II			12									
	BPA						3						
REF	Refinery										54		
ARO	Aromatics I					53							
	Aromatics II												