



IRPC Public Company Limited

Management Discussion and Analysis

**Operating Results for Year 2018
and the Fourth Quarter of 2018**

Management Discussion and Analysis (MD&A)

IRPC Public Company Limited and its subsidiaries

Operating Results for Year 2018 and the Fourth Quarter of 2018

Executive Summary

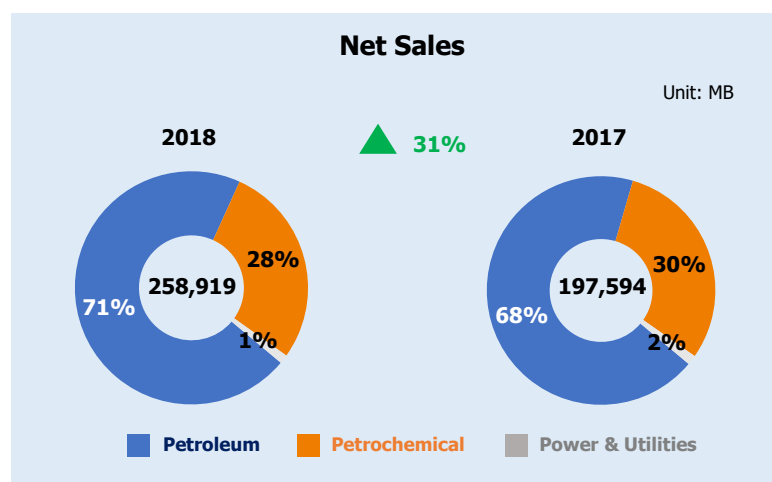
	Unit	Quarter			Change		Year		YoY
		4Q18	4Q17	3Q18	YoY	QoQ	2018	2017	
Crude Intake	Million bbl	19.09	19.05	18.68	0.2%	2%	76.05	65.54	16%
Sales ^[1]	Million Baht	69,736	62,891	73,819	11%	(6%)	280,551	214,101	31%
Net Sales ^[2]	Million Baht	64,233	58,443	68,831	10%	(7%)	258,919	197,594	31%
Market GIM	Million Baht	8,879	9,036	7,667	(2%)	16%	33,607	32,370	4%
	USD/bbl ^[3]	14.09	14.33	12.37	(2%)	14%	13.60	14.48	(6%)
Accounting GIM	Million Baht	4,151	10,864	8,738	(62%)	(52%)	32,370	34,638	(7%)
	USD/bbl	6.58	17.22	14.10	(62%)	(53%)	13.10	15.49	(15%)
EBITDA	Million Baht	534	6,530	5,258	(92%)	(90%)	18,344	20,420	(10%)
Net Profit	Million Baht	(1,627)	4,513	2,560	(136%)	(164%)	7,735	11,354	(32%)

Note: ^[1] **Sales** includes (1) Petroleum Sales (2) Petrochemical Sales (3) Power and Utilities Sales
(4) Sales of tank farm and port service, etc

^[2] **Net Sales** includes (1) Petroleum Sales (excluding excise tax) (2) Petrochemical Sales (3) Power and Utilities Sales

^[3] **Market GIM per bbl** : [(Market GIM / Crude Intake)/exchange rate]

In 2018, the Company generated net sales of Baht 258,919 million, increased by 31% when compared to 2017, YoY, which attributed to the increase in sales volume and products prices. The refinery utilization rate was 208,000 barrels per day of crude intake, rose 16% due to increasing



efficiency of the refinery plant after major turnaround during 1Q17. The Market GIM was Baht 33,607 million (USD 13.60 per barrel), increased 4% from last year mainly due to an increase in sales volume following the higher utilization rate. However, crude oil price had sharply declined as a result of supply surge especially from the U.S. as well

as the lower-than-expected economic growth through a prolonged trade war between China and the

United State. This resulted in the net stock loss of Baht 1,238 million, the Accounting GIM of Baht 32,370 million, down 7%, and earnings before interest, tax, depreciation and amortization ("EBITDA") of Baht 18,344 million, decrease 10%. The Company reported the depreciation amounting to Baht 8,237 million, rose 17% according to an increase in depreciation from PPE and PPC projects which started commercial operation since late 2017. Likewise, the financial costs of Baht 2,227 million, increased 12% caused by the lower gain from Cross Currency Swap ("CCS") by Baht 334 million together with the lower of gain from impairment and disposal of fixed assets amounting to Baht 296 million, decreased by 64% mainly owing to Non-recurring item in 2017 which was gains from reversal of impairment from disposal of investment property amounting to Baht 794 million. The corporate income tax of Baht 1,147 million, dropped 47% as a decrease in operating profit and an increase benefit from investment promotion (BOI), especially for environmental projects. As a result, the Company had a net profit of Baht 7,735 million, a 32% decline when compare to the previous year.

In the fourth quarter of 2018 (4Q18), the Company had net sales of Baht 64,233 million, fell by 7% from the previous quarter (3Q18), QoQ, which was mainly attributed to a decline in selling prices following crude oil price. The crude intake was 208,000 barrels per day (208 KBD), increased 2%. The Market GIM was Baht 8,879 million (USD 14.09 per barrel), improved by 16% because of the higher products spread as well as the resuming of Hyvahl and RDCC units after planned maintenance shutdown in 3Q18 allowing the Company to have higher high value products. However, as crude oil price plummeted led to the net stock loss of Baht 4,728 million (USD 7.51 per barrel) and the Accounting GIM of Baht 4,151 million or falling by 52% as well as the EBITDA of Baht 534 million, sharp decline by 90%. Meanwhile, the Company reported a higher of financial cost by Baht 318 million from a lower of CCS by Baht 345 million versus a decrease in corporate income tax by Baht 829 million due to the Company's net loss. Besides, there was gain from impairment and disposal of fixed assets amounted to Baht 250 million, mainly gain from sale of land to PTT which was Non-recurring item. Therefore, the Company had net loss of Baht 1,627 million, profit fell by 164% from the previous quarter.

Key incidents in 2018

- **Disposal of investment of IRPC Polyol Company Limited**

On April 30, 2018, the Company disposed the 25% stake holding in IRPC Polyol Company Limited (IRPCP) to PCC Rokita Spolka Akcyjna ("PCC Rokita"). After the disposal, IRPC and PCC Rokita jointly held 50% stake holding each in IRPCP. As a result, the IRPCP status has been changed from Subsidiary to be Join-venture and recorded loss of investment by Baht 45 million.

- **Investment in plastic product e-commerce business**

The Board of Directors no. 10/2018, held on 16 October 2018, resolved the following resolutions:

1. Approved the Company to invest in Guangzhao Saiju Performance Polymer Ltd. ("GZSJ") in the People's Republic of China (PRC) who operates the e-commerce platform under the name "IPLAS" (<https://www.isuwang.com> and <https://www.suwen8.com>). The investment is the subscription of capital increased shares equivalent to 15% of total registered capital, in an amount of RMB 135 million (equivalent to the estimated investment value of THB 650 million). GZSJ is the major operator of plastic product e-commerce business in PRC.
2. Approved the Company to incorporate the private limited liability company, "the subsidiary", under the laws of Thailand with the registered capital amounting to Baht 120 million (or approximate USD 3.5 million), by which the Company and GZSJ will hold the shares equivalent to 55% and 45% of total shares, respectively. Such the subsidiary will be incorporated to develop the e-commerce platform in Thailand.

- **Sales of land in Wang Chan district to PTT**

The Board of Directors meeting, held on 23 November 2018, has passed the resolution on the approval of the land for sales to PTT Public Company Limited ("PTT") which is located in Pa-Yup-Nai sub-district, Wang Chan district, Rayong province. The land has a total area of about 152 rai approximately Baht 325 million. The sale was transferred on December 24, 2018. The Company had gain from sale of land by Baht 253 million.

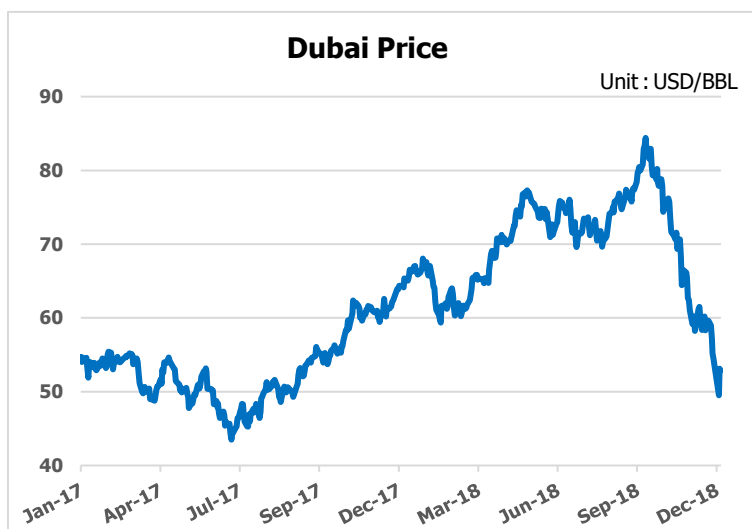
Operating Performance

1. Operating Performance by Business Units

1.1. Petroleum business unit

1.1.1 Petroleum Market Overview

According to crude oil market in 2018, the average global crude oil demand was 100 million barrels per day. Dubai price in 2018 moved in the range of USD 49.5-84.4 per barrel, an average of USD 69.4 per barrel, sharply increased USD 16.2 per barrel from an average of USD 53.2 per barrel in 2017. Crude oil prices had continuously increased during the first nine months of 2018 mainly due to the tightening supply situation. This was supporting by the collaboration among petroleum producers from both OPEC and Non-OPEC members to reduce crude oil output, the limited Iran's export after the United States sanctions, together with the lower production from Venezuela towards the country's economic problems. However, crude oil prices plunged during 4Q18 after the United States granted eight oil importers waivers from the Iranian sanctions leading to higher export volume from Iran as well as the crude oil demand shrank amid a continued escalation of the U.S. – China trade war.



In 4Q18, the average Dubai price was USD 67.4 per barrel, dropped by USD 6.9 per barrel when compared to average Dubai price in 3Q18. It fluctuated in the range of USD 49.5 - 84.4 per barrel. During the quarter, it had continued increased and reached the highest level at USD 84.4 per barrel in the beginning of October as the tight supply towards a decreasing export

from Iran after the U.S. imposed sanction. Nevertheless, an increase in U.S. crude oil production as a higher drilling activities owing to a rise of Cushing's pipeline capacity more than 500,000 barrels per day in November 2018 along with a decline in global economic growth forecast to 3.7% in 2019 by the International Monetary Fund (IMF) because of the U.S. – China trade war resulted in crude oil prices fell to the lowest of USD 49.5 per barrel.

1.1.3 Petroleum Sales

Products	Sales Volume (Million Barrel)				
	Quarter			Year	
	4Q18	4Q17	3Q18	2018	2017
Refinery	15.44	15.05	15.29	60.83	52.39
Lube Base Oil	1.74	1.79	1.69	7.01	6.43
Total	17.18	16.84	16.98	67.84	58.82

Sales Value (Million Baht)				
Quarter			Year	
4Q18	4Q17	3Q18	2018	2017
40,924	36,243	43,998	163,724	119,015
4,981	4,404	4,915	19,229	16,110
45,905	40,647	48,913	182,953	135,125

In 2018, net sales of petroleum businesses increased by 35% from 2017 due to the company's major turnaround during 1Q17

In 2018, net sales of petroleum businesses were Baht 182,953 million, increasing by Baht 47,828 million or 35% from 2017. This was caused by 20% increase in average products prices following the rising crude oil price as well as 15% increase in sales volume from 58.52 million barrels to 67.84 million barrels according to the company's major turnaround during 1Q17. The risen sales volume was mainly from Gas Oil and ULG95, after the start-up of Gasoline Maximization Project since November 2017.

In 4Q18, net sales of petroleum businesses were Baht 45,905 million, decreasing by Baht 3,008 million or 6% from 3Q18 owing to 7% decline in average products prices following the dropping crude oil price while 1% increase in sales volume mainly from Gas Oil, LPG and ULG95.

When compared with 4Q17, the net sales were up by Baht 5,258 million or 13%, mainly from 11% increase in average products prices following the rising crude oil price and 2% increase in sales volume. The rise in sales volume was mainly from ULG95 and Gas Oil.

1.1.4 Petroleum Sales Breakdown

Products	Quarter					
	4Q18		4Q17		3Q18	
	Local	Export	Local	Export	Local	Export
Refinery	58%	42%	55%	45%	55%	45%
Lube Base Oil	35%	65%	45%	55%	41%	59%
Total	56%	44%	54%	46%	54%	46%

Year			
2018		2017	
Local	Export	Local	Export
60%	40%	59%	41%
40%	60%	49%	51%
57%	43%	58%	42%

The percentage of domestic and export of petroleum product sales in 2018 was 57% and 43% respectively. The percentage of domestic sales was slightly decreased by 1% comparing with 2017,

mainly from Asphalt product. The export products in 2018 mostly shipped to Singapore, Malaysia and Cambodia, respectively.

For 4Q18, the percentage of domestic and export of petroleum product was 56% and 44% accordingly. The percentage of domestic sales increased by 2% comparing with 3Q18, mainly from Gas Oil product in Refinery group.

When compared with 4Q17, the percentage of domestic also increased by 2%, mainly from Gas Oil and ULG95 products in Refinery group.

1.1.5 Petroleum Product Spread

Average price	Quarter			% Change		Year		YoY
	4Q18	4Q17	3Q18	YoY	QoQ	2018	2017	
Dubai Crude Oil (USD/bbl)	67.42	59.32	74.28	14%	(9%)	69.42	53.17	31%
Petroleum (USD/bbl)								
Naphtha – Dubai	(6.4)	3.0	(1.3)	n.a.	n.a.	(2.4)	0.7	n.a.
ULG95 – Dubai	4.7	14.4	11.6	(67%)	(59%)	10.5	14.9	(30%)
Gas Oil 0.05%S - Dubai	14.8	13.0	14.4	14%	3%	14.6	12.5	17%
FO 180 3.5%S - Dubai	1.4	(3.1)	(2.5)	145%	156%	(2.6)	(2.3)	(13%)
Lube Base Oil (USD/MT)								
500SN - FO 180 3.5%S	375	458	417	(18%)	(10%)	447	498	(10%)
150BS - FO 180 3.5%S	471	536	471	(12%)	0%	518	602	(14%)
Asphalt - FO 180 3.5%S	(20)	(44)	(41)	55%	51%	(46)	(31)	(48%)

The spread between Petroleum products and Dubai

- **Naphtha Spread-Lower:** Naphtha – Dubai spread in 2018 was USD -2.4 per barrel, decreased when compared to 2017 of USD 0.7 per barrel because of high supply in Europe and the increasing export volume from the Middle East.

Naphtha–Dubai spread in 4Q18 was USD -6.4 per barrel, down from USD -1.3 per barrel of 3Q18. This was mainly due to the high export volume from the Middle East till January 2019 as a result of their Cracker plants' maintenance shutdown. In addition, the high level of supply from Europe continued pressured Naphtha price.

- **ULG95 Spread- Lower:** ULG 95-Dubai spread in 2018 was USD 10.5 per barrel, declining by 30% from 2017 of USD 14.9 per barrel. This resulted from oversupply leading to the high-volume

gasoline inventory in the U.S. and Europe. Furthermore, the continuous increase in export volume from China also pressured the price.

ULG95- Dubai spread in 4Q18 was USD 4.7 per barrel, decreased by 59% from 3Q18 of USD 11.6 per barrel. This was due to soften demand ahead of winter and the high supply in Asia after resuming refineries' operations from seasonal maintenance shutdowns. In addition, a higher gasoline production according to the high-level of U.S. Shale Oil output as well as a continuously increase in export volume from China were the other factors to weaken the spread.

- **Gas Oil Spread-Higher:** Gas Oil 0.05% S-Dubai was USD 14.6 per barrel in 2018, up by 17% when compared with 2017 of USD 12.5 per barrel. The increase was owing to the higher global demand especially from North Asia, Middle East, and South Africa and the decrease in export volume from China.

In this quarter, Gas Oil 0.05%S - Dubai spread was USD 14.8 per barrel, up by 3% when compared to 3Q18 of USD 14.4 per barrel, due to high demand from Asia supporting from Election activities in India, a low inventory volume in the region including a decline in export volume from China. However, the weather was not cold as expected during the winter resulted in the weaken Diesel demand.

- **Fuel Oil Spread-Lower:** Fuel Oil (FO 180 3.5%S) - Dubai spread in 2018 was USD -2.6 per barrel, down by 13% when compared with 2017 of USD -2.3 per barrel owing to lower demand from Asia.

In 4Q18, Fuel Oil-Dubai spread was USD 1.4 per barrel, increased by 156% from 3Q18 of USD -2.5 per barrel as a result of the increase demand in Europe and Persian Gulf causing the decrease in export volume to Asia. In addition, the lower export volume from Iran after sanction from the United States and the increasing fuel oil demand during the winter supported higher price.

The spread between Lube Base Oil products and FO 180 3.5%S

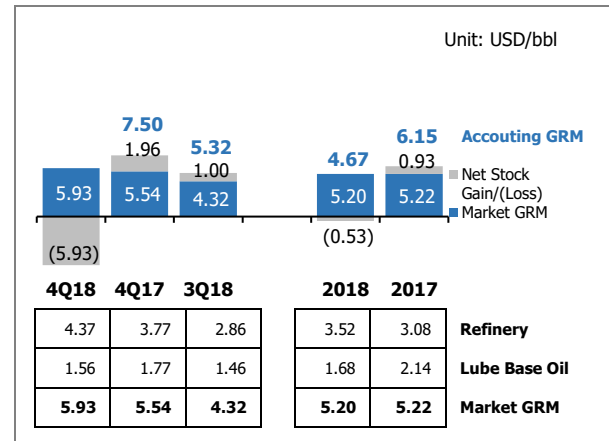
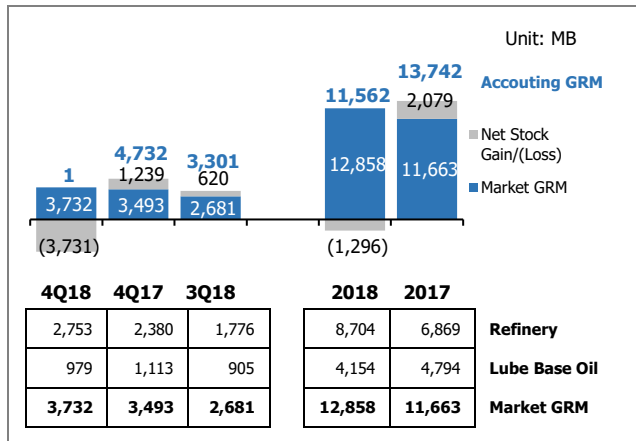
- **500SN Spread- Lower:** Lube base 500SN-fuel oil spread in 2018 was USD 447 per ton, decreasing by 10% from USD 498 per ton in 2018 according to low import from China due to much weaken Yuan Renminbi against U.S. dollar. This affected to higher import products price when compared to domestic products price and push the price down.

Lube base 500SN-fuel oil spread in 4Q18 was USD 375 per ton, decreased by 10% from 3Q18 of USD 417 per ton due to high production volume while lower demand as a result of inventories reduction policy during the year end.

- **Asphalt Spread- Lower:** Asphalt-fuel oil spread in 2018 was USD -46 per ton, dropping by 48% from 2017 of USD -31 per ton, because of the decreasing demand as the lower road construction project than last year.

Asphalt-fuel oil spread in 4Q18 was USD -20 per ton, up by 51% when compared to 3Q18 of USD -41 per ton, caused by an increase demand after the monsoon season together with the accelerating of road construction to complete within the budget period during the year end.

1.1.6 Gross Refining Margin



In 2018, Market GRM rose YoY due to an increase in sales volume as higher crude run than last year versus higher crude premium



For 2018, The Market Gross Refining Margin (Market GRM) was Baht 12,858 million or USD 5.20 per barrel, rose by Baht 1,195 million from 2017 owing to an increase in sales volume as higher crude run than last year, resulting from increasing efficiency of refinery plant after major turnaround during 1Q17, despite higher crude premium. According to sharply dropped of crude oil price, there was the net stock loss of Baht 1,296 million or USD 0.53 per barrel including the stock loss of Baht 663 million or USD 0.27 per barrel and a loss of LCM amounting to Baht 665 million or USD 0.27 per barrel against oil hedging gain of Baht 30 million or USD 0.01 per barrel. Therefore, the company reported Accounting GRM of Baht 11,562 million or USD 4.67 per barrel.

Market GRM in 4Q18 was Baht 3,732 million or USD 5.93 per barrel, increased by Baht 1,051 million or USD 1.61 per barrel from 3Q18. This was caused by the increase in Fuel Oil and Asphalt spreads as well as the resuming of the RDCC plant after planned shutdown in 3Q18. When compared with 4Q17, Market GRM increased by Baht 239 million or USD 0.39 per barrel.

In 4Q18, there was the net stock loss of Baht 3,731 million or USD 5.93 per barrel, comprising of stock loss of Baht 2,989 million, a loss from LCM of Baht 665 million and oil hedging loss of Baht 78 million. Hence, Accounting GRM was Baht 1 million declined by Baht 3,300 million from 3Q18 and Baht 4,731 million from 4Q17.

1.2 Petrochemical business units

1.2.1 Petrochemical Market Overview

For 2018 market situation, Demand of petrochemical products had increased according to the global economic growth rate coupled with China's environmental control policy in order to reduce the use of Scrap & Waste plastics. Such demand had largely increased in the first half of the year in accordance with Thailand economic growth of 4.8% in the first half of the year which was the highest growth rate over the past 5 years. This was mainly due to the continuous economic stimulation through government spending including the recovery of the export sector amid the manufacturing sector recovery in many countries. However, exports were limited from the major importing country's policy particularly China, Indonesia and Vietnam, because of their capacities expansion and lessen level of imports. Regarding petrochemical supply, the Coal to Olefins (CTO) and Methanol to Olefins (MTO) producers which accounted for 4-5% of the global ethylene and propylene productions had diminished their productions due to cost overrun driven by the corrosion of production equipment, the environmental issues in China together with a shortage of water that requires a large amount for production. However, after the U.S. - China trade war intensifying in the second half of the year resulted in the monetary-easing policy in China in order to maintain domestic economy and economic growth. As such, the RMB devaluation caused the delay purchase of Petrochemicals products, especially Polystyrenics because China is a major importer of such polymer, to reduce the risk of exchange rate fluctuations. In addition, products demand decreased on the back of fluctuations in raw material prices and inventories reduction during year end.

Market situation of the petrochemical business in 4Q18, fluctuations in raw materials price and trade war between the U.S. and China continued to cause significant pressure on products demand, especially Styrenics and HDPE because such plastics resin were used to produce electrical and home appliances, as well as children's toys which were directly affected by the trade war. This resulted in the lower purchasing only as needed. In the long term horizon, the manufacturers may consider changing their production bases to other countries that have less impact from the U.S. - China trade war. For the market situation of polypropylene, still maintained at a high level supporting by the lower production from unplanned shutdown plant in the Middle East region, despite soften demand due to concerns on trade war and the reduction of inventories during year end.

1.2.2 Petrochemical Capacity

Petrochemical	Quarter			% Change		Year		YoY
	4Q18	4Q17	3Q18	YoY	QoQ	2018	2017	
Utilization Rate								
Olefins Group*	98%	101%	95%	(3%)	3%	94%	87%	7%
Aromatics and Styrenics Group	104%	100%	97%	4%	7%	101%	90%	11%

Note: * Olefins Group's capacity increased by 300,000 tons per year after the COD of PP Expansion and PP Compound in 3Q17 and 4Q17, respectively.

In 2018, the utilization rate of Olefins and Aromatics & Styrenics were 94% and 101%, respectively, increased by 7% and 11% when compare to the utilization rate in 2017 due to planned major turnaround in 2017.

The utilization rate of Olefins in 4Q18 was 98%, increasing by 3% when compared to 3Q18 of 95% owing to the lower utilization rate to balance feedstock regarding the RDCC and Hyvahl units planned shutdown in 3Q18.

The utilization rate of Aromatics & Styrenics in 4Q18 was 104%, increasing by 7% from 3Q18. It caused by the Aromatics plant shutdown approximately 1 week for Heat Exchanger maintenance and planned maintenance shutdown of SAN unit for 12 days during 3Q18.

1.2.3 Petrochemical Sales

Products	Sales Volume (KMT)					Sales Value (Million Baht)				
	Quarter			Year		Quarter			Year	
	4Q18	4Q17	3Q18	2018	2017	4Q18	4Q17	3Q18	2018	2017
Olefins Group	278	276	275	1,107	952	10,815	10,342	11,495	43,980	35,044
Aromatics and Styrenics Group	176	172	176	728	631	6,660	6,712	7,563	28,760	24,684
Total	454	448	451	1,835	1,583	17,475	17,054	19,058	72,740	59,728

In 2018, net sales of petrochemical businesses rose by 22% from 2017 owing to planned major turnaround in 1Q17

and 40% from Aromatics & Styrenics group.

In 2018, net sales of petrochemical businesses were Baht 72,740 million, up by Baht 13,012 million or 22% from 2017. The main reason was 16% increase in sales volume by 252 thousand metric tons (KMT) according to planned major turnaround in 1Q17 and 6% increase in average selling prices. The net sales were 60% from Olefins group

Net sales of petrochemical businesses in 4Q18 were Baht 17,475 million, declining by Baht 1,583 million or 8% from 3Q18. The main reasons were 9% decrease in average selling prices following lower raw material prices while 1% increase in sales volume by 3 KMT.

Compared with 4Q17, net sales increased by Baht 421 million or 2%, due to 1% increase in average selling prices according to higher raw material prices as well as 1% increase in sales volume from 448 KMT to 454 KMT.

1.2.4 Petrochemical Sales Breakdown

Products	Quarter						Year			
	4Q18		4Q17		3Q18		2018		2017	
	Local	Export	Local	Export	Local	Export	Local	Export	Local	Export
Olefins Group	60%	40%	56%	44%	59%	41%	58%	42%	60%	40%
Aromatics and Styrenics Group	50%	50%	43%	57%	45%	55%	46%	54%	47%	53%
Total	56%	44%	51%	49%	53%	47%	53%	47%	55%	45%

When compared with 2018, the proportion of Petrochemical sales were 53% domestic and 47% export. The export sales increased by 2% mostly from PP product after PPE&PPC plants started commercial operation in late 2017. The petrochemical exported products in 2018 mostly shipped to Hong Kong, Singapore and Vietnam, respectively.

For 4Q18, the proportion of Petrochemical sales were 56% domestic and 44% export. The domestic sales increased by 3% from last quarter, mostly from HDPE product in Olefins group and Mixed Xylene product in Aromatics & Styrenics group. When compared with 4Q17, domestic sales also increased by 5%, mainly from PP product in Olefins group and products in Aromatics & Styrenics group.

1.2.5 The spread between key petrochemical products and raw material

Average Price (USD/MT)	Quarter			%Change		Year		YoY
	4Q18	4Q17	3Q18	YoY	QoQ	2018	2017	
Naphtha	567	570	667	(1%)	(15%)	614	496	24%
Olefins								
Ethylene – Naphtha	306	626	550	(51%)	(44%)	526	596	(12%)
HDPE – Ethylene	389	284	267	37%	46%	360	235	53%
HDPE – Naphtha	695	910	817	(24%)	(15%)	886	831	7%
Propylene – Naphtha	369	258	361	43%	2%	375	328	14%
PP – Propylene	272	363	256	(25%)	6%	278	328	(15%)
PP – Naphtha	641	621	617	3%	4%	653	656	(0%)
Aromatics								
BZ – Naphtha	127	266	189	(52%)	(33%)	207	324	(36%)
TOL – Naphtha	119	109	121	9%	(2%)	123	159	(23%)
MX – Naphtha	219	114	217	92%	1%	196	172	14%
Styrenics								
SM – Naphtha	567	699	757	(19%)	(25%)	726	754	(4%)
ABS – Naphtha	1,032	1,353	1,248	(24%)	(17%)	1,272	1,334	(5%)
ABS – SM	465	654	491	(29%)	(5%)	546	580	(6%)
PS (GPPS) – Naphtha	807	905	898	(11%)	(10%)	912	947	(4%)
PS (GPPS) – SM	240	206	141	17%	70%	186	193	(4%)

The spread between key products and raw material

The spread between Polyolefins group and Naphtha

- HDPE Spread-Higher:** HDPE-Naphtha spread in 2018 was USD 886 per ton, increased by 7% from 2017 of USD 831 per ton due to the continuously increasing demand in HDPE for pipe production in China driven by “One Belt, One Road” project and natural gas power generation project in order to replace coal power generation in accordance with China’s environmental concern policy.

HDPE-Naphtha spread in 4Q18 was USD 695 per ton, down by 15% when compared to previous quarter at USD 817 per ton due to the delayed of natural gas power generation construction. Hence, pipe construction dropped and led to soften demand of HDPE Pipe grade.

- **PP Spread-Flat:** PP-Naphtha spread in 2018 was USD 653 per ton, being comparable from 2017 of USD 656 per ton. This was because the increase in additional capacity was less than the additional demand. The increasing demand owing to the reduction of Scrap & Waste plastics according to environmental control policy. However, demand declined toward the end of the year after the US-China trade war had intensified.

PP-Naphtha spread in 4Q18 was USD 641 per ton, increased by 4% when compared with 3Q18 at USD 617 per ton because of sharp decrease in Naphtha price following crude oil price together with the lower supply through unplanned shutdown in the Middle East.

The spread between Aromatics group and Naphtha

- **TOL Spread-Lower:** Toluene - Naphtha spread in 2018 was USD 123 per ton, down by 23% when compared to USD 159 per ton in 2017. It was because Toluene demand to be components of gasoline decreased following lower gasoline demand.

Toluene-Naphtha spread in 4Q18 was USD 119 per ton, down by 2% when compared to USD 121 per ton in 3Q18, owing to the increasing volume from the U.S. as well as the higher volume in North East Asia after resuming Aromatic plant operations from maintenance shutdown.

- **MX Spread-Higher:** Mixed Xylene-Naphtha spread in 2018 was USD 196 per ton, up by 14% when compared to USD 172 per ton in 2017 due to the increasing MX demand to be raw materials for Para-xylene.

Mixed Xylene-Naphtha spread in 4Q18 was USD 219 per ton, in line with 3Q18 because of a decrease in naphtha price according to a drop in crude oil price. However, the MX demand also decreased following lower demand in Para-xylene.

The spread between Polystyrenics group and Naphtha

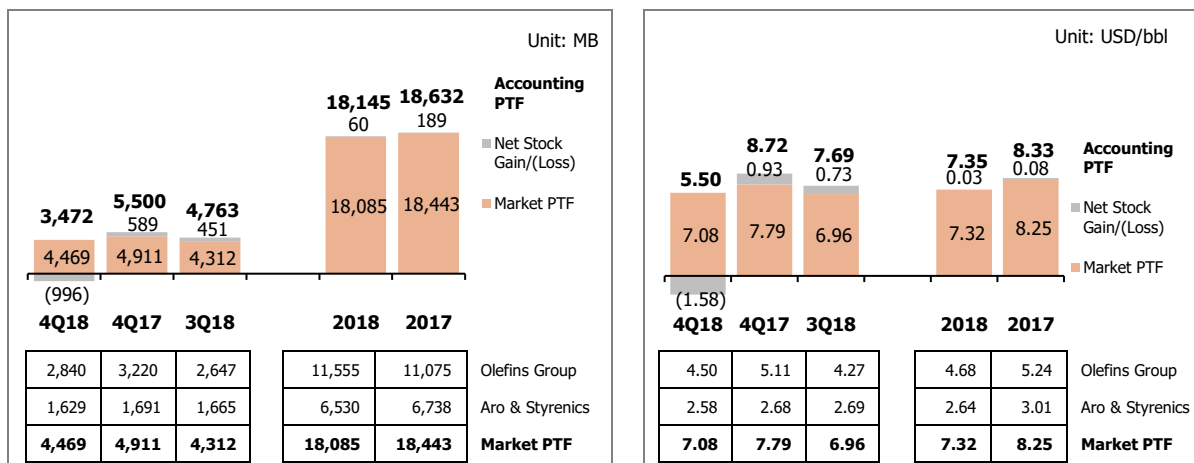
- **ABS Spread-Lower:** ABS-Naphtha spread in 2018 was USD 1,272 per ton, down by 5% when compared to USD 1,334 per ton in 2017 due to a drop demand in China as the impact of the trade war between the U.S. and China while less additional supply helped support its price.

ABS-Naphtha spread was USD 1,032 per ton in 4Q18, down by 17% when compared to USD 1,248 per ton in 3Q18 owing to decreasing demand in China through the prolonged U.S. – China trade war.

- PS Spread-Lower:** PS-Naphtha spread in 2018 was USD 912 per ton, slightly declined by 4% when compared to USD 947 per ton in 2017 because of slow demand. This was caused by Single-Use-Plastic Ban Policy in Europe as well as the substitution of lower-priced polymers.

PS-Naphtha in 4Q18 was USD 807 per ton, down by 10 % from 3Q18 of USD 898 per ton, due to the worse U.S.-China trade war and a decrease in inventory volume at year-end.

1.2.6 Product to Feed Margin (Product to Feed : PTF)



In 2018, Market PTF was down by Baht 358 million or USD 0.93 per barrel, YoY, from the decline in product spreads

In 2018, the Market Product to Feed (Market PTF) of Baht 18,085 million or USD 7.32 per barrel decreased by Baht 358 million or USD 0.93 per barrel from 2017 as the decline in the petrochemical product spreads. The net stock gain was Baht 60 million, comprising of stock gain of Baht 243 million against a loss from LCM of Baht 183 million. Thus, the Company has Accounting PTF of Baht 18,145 million or USD 7.35 per barrel, decreasing by Baht 487 million or USD 0.98 per barrel from 2017.

In 4Q18, Market PTF of Baht 4,469 million or USD 7.08 per barrel increased by Baht 157 million or USD 0.12 per barrel from 3Q18 as the increase in the petrochemical product spreads especially PP product. While Market PTF decreased by Baht 442 million or USD 0.71 per barrel when compared with 4Q17 as the decline in the petrochemical product spreads especially HDPE product.

The net stock loss of Baht 996 million in 4Q18, including stock loss of Baht 820 million and a loss of LCM of Baht 176 million. Therefore, the company had Accounting PTF of Baht 3,472 million or USD 5.50 per barrel. When compared with last quarter, it declined by Baht 1,291 million or USD 2.19 per barrel and declined by Baht 2,028 million or USD 3.22 per barrel from the same period last year.

1.3 Power Plant and Utility business units

1.3.1 Power Plant Capacity and Sales

	Quarter			% Change		Year		YoY
	4Q18	4Q17	3Q18	YoY	QoQ	2018	2017	
Utilization Rate								
Electricity	80%	76%	76%	4%	4%	79%	75%	4%
Steam	83%	79%	76%	4%	7%	79%	73%	6%
Sales (Baht million)								
Electricity	507	437	517	16%	(2%)	1,947	1,629	20%
Steam	284	251	279	13%	2%	1,034	916	13%
Others	62	54	64	15%	(3%)	245	196	25%
Total	853	742	860	15%	(1%)	3,226	2,741	18%

In 2018, the utilization rate of Electricity and Steam were equal at 79%, rising by 4% and 6% from 2017 respectively. Net sales of power and utility businesses were Baht 3,226 million, increasing by Baht 485 million or 18% from last year due to higher production volume after the planned major turnaround in 2017.

In 4Q18, the utilization rate of Electricity and Steam were 80% and 83% respectively, increasing by 4% and 7% from last quarter consecutively. This resulted from lower usage of both electricity and steam amid the RDCC and Hyvahl planned shutdown during 3Q18.

Net sales of power and utility businesses in 4Q18 were Baht 853 million, decreasing by Baht 7 million or 1% QoQ, mainly due to a decrease in sale volume. When compared with Baht 742 million in 4Q17, net sales increased by Baht 111 million or 15% owing to planned maintenance of power plant in 4Q17.

2. Total Operating Performance

Total Operating Performance of IRPC and its subsidiaries for Year 2018 and quarter 4Q18 are as follow;

	Unit : Million Baht					Unit : USD per barrel				
	Quarter			Year		Quarter			Year	
	4Q18	4Q17	3Q18	2018	2017	4Q18	4Q17	3Q18	2018	2017
Average FX (THB/USD)	32.98	33.11	33.15	32.48	34.11					
Total Crude Intake (Mbbl)	19.09	19.05	18.68	76.05	65.54					
Average Crude (USD/bbl) ⁽¹⁾	70.66	61.91	77.13	72.65	55.26					
Sales ⁽²⁾	69,736	62,891	73,819	280,551	214,101	110.76	99.71	119.21	113.58	95.77
Net Sales ⁽³⁾	64,233	58,443	68,831	258,919	197,594	102.02	92.66	111.15	104.82	88.37
Cost of Feedstock (Market Price)	(55,354)	(49,407)	(61,164)	(225,312)	(165,224)	(87.93)	(78.33)	(98.78)	(91.22)	(73.89)
Market GIM	8,879	9,036	7,667	33,607	32,370	14.09	14.33	12.37	13.60	14.48
Stock Gain/(Loss)	(3,809)	2,058	1,017	(420)	3,720	(6.05)	3.26	1.64	(0.17)	1.66
Lower of Cost or Market	(841)	1	-	(848)	0	(1.34)	0.00	-	(0.34)	0.00
Oil Hedging Gain/(Loss)	(78)	(231)	54	30	(1,452)	(0.12)	(0.37)	0.09	0.01	(0.65)
Accounting GIM	4,151	10,864	8,738	32,370	34,638	6.58	17.22	14.10	13.10	15.49
Other Incomes ⁽⁴⁾	432	303	371	1,577	1,423	0.69	0.48	0.60	0.64	0.64
Selling Expenses	(405)	(399)	(375)	(1,524)	(1,296)	(0.64)	(0.63)	(0.61)	(0.62)	(0.58)
Accounting GIM and Other Incomes	4,178	10,768	8,734	32,423	34,765	6.63	17.07	14.09	13.12	15.55
OPEX	(3,645)	(4,238)	(3,475)	(14,080)	(14,345)	(5.79)	(6.72)	(5.61)	(5.70)	(6.41)
EBITDA	534	6,530	5,258	18,344	20,420	0.84	10.35	8.48	7.42	9.14
Depreciation	(2,105)	(2,024)	(2,046)	(8,237)	(7,062)	(3.34)	(3.21)	(3.30)	(3.33)	(3.16)
EBIT	(1,571)	4,506	3,212	10,106	13,358	(2.50)	7.14	5.18	4.09	5.98
Net Financing Cost	(818)	(194)	(500)	(2,227)	(1,983)	(1.30)	(0.31)	(0.81)	(0.90)	(0.89)
Gain/(Loss) from Foreign Exchange	(14)	87	57	68	764	(0.02)	0.14	0.09	0.03	0.34
Gain/(Loss) from impairment and disposal of fixed assets	250	594	(5)	296	832	0.40	0.94	(0.01)	0.12	0.37
Gain/(Loss) from Investment	105	256	203	680	577	0.17	0.41	0.33	0.27	0.25
Other Expenses	(6)	2	(2)	(8)	(7)	(0.01)	0.00	(0.00)	(0.00)	(0.00)
Net Profit/(Loss) before Income Tax	(2,053)	5,251	2,965	8,915	13,541	(3.26)	8.32	4.78	3.61	6.05
Income Tax	434	(736)	(395)	(1,147)	(2,181)	0.69	(1.17)	(0.64)	(0.46)	(0.98)
Gain/(Loss) from non-controlling interests	(8)	(1)	(10)	(34)	(5)	(0.01)	(0.00)	(0.02)	(0.01)	(0.00)
Net Profit/(Loss)	(1,627)	4,513	2,560	7,735	11,354	(2.58)	7.15	4.12	3.14	5.07
Earning per share (EPS) (Baht/share)	(0.08)	0.22	0.13	0.38	0.56					

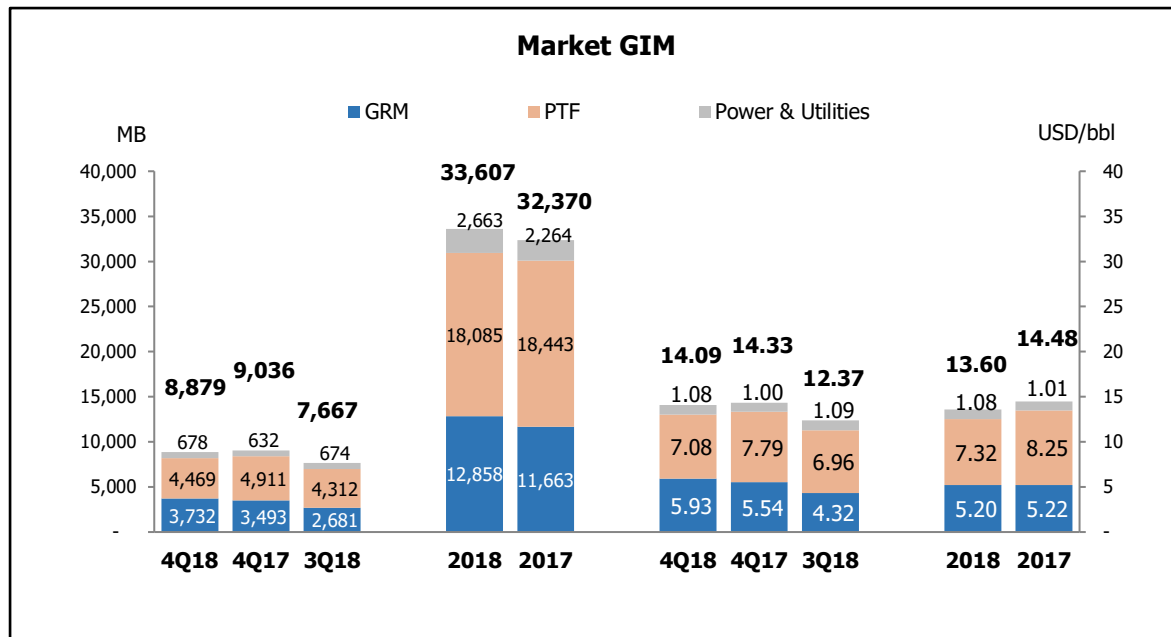
Note : ⁽¹⁾ Average market prices of crude used in the production process

⁽²⁾ Sales includes (1) Petroleum Sales (2) Petrochemical Sales (3) Power and Utilities Sales (4) Sales of tank farm and port service, etc

⁽³⁾ Net Sales includes (1) Petroleum Sales (excluding excise tax) (2) Petrochemical Sales (3) Power and Utilities Sales

⁽⁴⁾ Including port, tank farm and service etc.

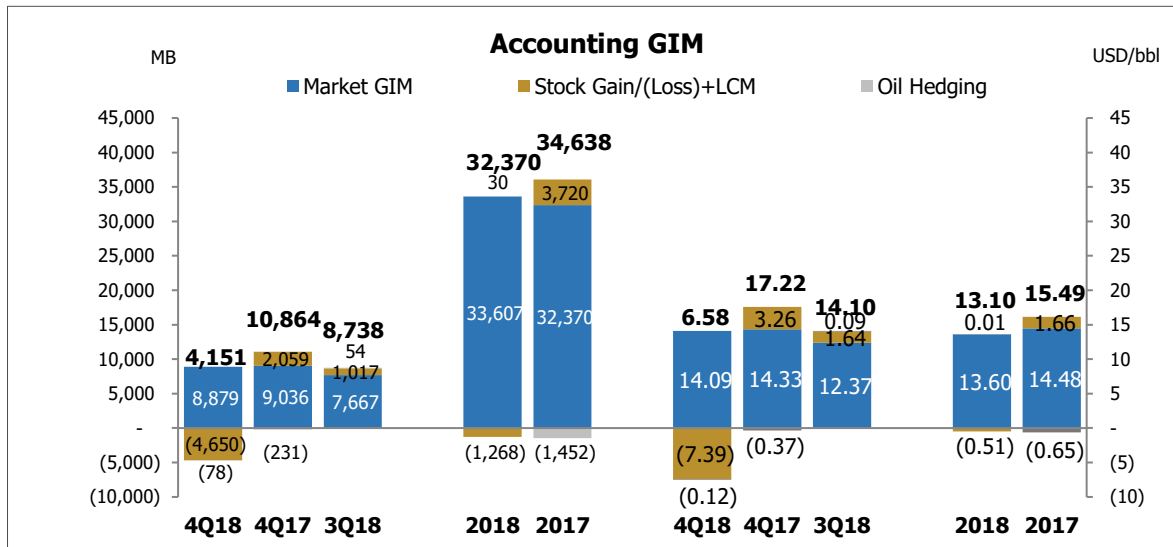
2.1 Market Gross Integrated Margin (Market GIM)



For 2018, Market GIM was Baht 33,607 million or USD 13.60 per barrel increased by Baht 1,237 million from 2017 owing to an increase in sales volume as a higher crude run than last year, resulting from increasing efficiency of Refinery plant after major turnaround during 1Q17 despite higher crude premium and lower products spread.

In 4Q18, Market GIM of Baht 8,879 million or USD 14.09 per barrel increased by Baht 1,212 million or USD 1.72 per barrel from 3Q18 because of the higher products spread as well as the resuming operation after maintenance shutdown of the Hyvahl unit for its catalyst replacement and the RDCC unit for catalyst cooler system's tie-in preparation in 3Q18, allowing the Company to have higher high value products while crude premium was higher than last quarter. When compared with 4Q17, Market GIM dropped by Baht 157 million or USD 0.24 per barrel owing to higher crude premium.

2.2 Accounting Gross Integrated Margin (Accounting GIM)



For 2018, Accounting GIM of Baht 32,370 million or USD 13.10 per barrel declined by Baht 2,268 million or USD 2.39 per barrel from 2017 including a rise in net stock loss of Baht 3,506 million against an increase in Market GIM of Baht 1,237 million.

In 4Q18, Accounting GIM of Baht 4,151 million or USD 6.58 per barrel declined by Baht 4,587 million or USD 7.52 per barrel from 3Q18. This resulted from the increase in net stock loss of Baht 5,799 million or USD 9.24 per barrel versus the increase in Market GIM of Baht 1,212 million or USD 1.72 per barrel. When compared with 4Q17, Accounting GIM decreased by Baht 6,713 million or USD 10.64 per barrel because of an increase in net stock loss of Baht 6,556 million or USD 10.4 per barrel together with a decline in Market GIM of Baht 157 million or USD 0.24 per barrel.

2.3 Other incomes

Other incomes consist of port and tank farm services and other services. For 2018, other incomes were Baht 1,577 million, up by Baht 154 million from last year. This was mainly owing to a rise of shipments following an increase in utilization rate as well as an increase in tank farm services according to higher rental volume.

In 4Q18, the Company had other incomes amounting to Baht 432 million, increased by Baht 61 million from 3Q18 due to a rise of shipments following higher crude run due to operation resumption of the Hyvahl and RDCC units after planned shutdown in 3Q18. When compared with 4Q17, other incomes rose by Baht 129 million, mainly from a decline in Port's Total Service Solution revenue since its maintenance shutdown in 4Q17.

2.4 Operating Expenses

For 2018, the operating expenses of Baht 14,080 million decreased by Baht 266 million, mainly because of a decline in consulting fee versus a rise in staff costs from an increase employee benefit expenses in accordance with the Company's policy.

In 4Q18, the operating expenses of Baht 3,645 million increased by Baht 170 million QoQ mainly from maintenance expenses and consulting fee. When compared with 4Q17, a decline in operating expenses of Baht 594 million was owing to a decrease in staff costs and consulting fee.

2.5 Depreciation and Amortization Expenses

For 2018, the depreciation of Baht 8,237 million increased by Baht 1,175 million from 2017. This resulted from an increase in assets after the completion of the expansion and efficiency improvement projects such as Polypropylene Expansion Project (PPE), Polypropylene Compounding Project (PPC) and Gasoline Maximization Project. In addition, the major turnaround expenses were capitalized as the assets and be amortized for 5 years since 2Q17.

In 4Q18, the depreciation of Baht 2,105 million increased by Baht 59 million QoQ and Baht 81 million from 4Q17. The main reason was the efficiency improvement projects has started operation since late 2017.

2.6 Financial Costs

For 2018, financial cost of Baht 2,227 million rose by Baht 244 million from 2017. This was caused by a loss from financial derivatives – Cross Currency Swap (CCS) of Baht 276 million in 2018 while in 2017, there were gains from CCS of Baht 58 million offsetting with a decrease of interest expenses by Baht 95 million as the repayment of long-term loan.

In 4Q18, financial costs of Baht 818 million was up by Baht 318 million from 3Q18 and Baht 624 million from 4Q17 as a result of loss from CCS amounting to Baht 345 million in 4Q18 while gain from CCS of Baht 259 million in 4Q17.

2.7 Gain/(Loss) from Foreign Exchange

For 2018, the Company recorded gain from foreign exchange of Baht 68 million, mainly the unrealized gain from foreign exchange due to Thai Baht appreciation from Baht 32.85 per USD at the end of 2017 to Baht 32.61 per USD at the end of 2018. While there was gain from foreign exchange of Baht 764 million in 2017 because of Thai Baht appreciation from Baht 36.00 per USD at the end of 2016 to Baht 32.85 per USD at the end of 2017. The Company has outstanding USD debt of USD 200 million at the end of 2018.

In 4Q18, the Company reported the loss from foreign exchange of Baht 14 million as a result of Thai Baht slightly depreciated against USD. When compared with 3Q18 and 4Q17, there was gain from foreign exchange of Baht 57 million and Baht 87 million respectively.

2.8 Gain/(Loss) from Impairment and disposal of fixed assets

Gain from impairment and disposal of fixed assets in 2018 was Baht 296 million, due mainly to the disposal of land. When compared with 2017, there was gain from impairment and disposal of fixed assets of Baht 832 million in 2017 including gain from the reversal impairment of long-term investments related to the previous management amounting to Baht 562 million and gain from the appraisal of investment property of Baht 232 million.

In 4Q18, the Company had gain from impairment and disposal of fixed assets of Baht 250 million, mainly owing to the disposal of land in Wang Chan district to PTT Plc. In 3Q18, there was loss from impairment and disposal of fixed assets of Baht 5 million. In 4Q17, the Company recorded gain from the reversal of assets of Baht 594 million due to the reversal impairment of long-term investment as mentioned above.

2.9 Gain/(Loss) from Investments

For 2018, the Company had gain from investments of Baht 680 million, increased by Baht 103 million from last year. This was caused by the higher of equity values in associates, mainly from IRPC Clean Power Co., Ltd. and UBE Chemicals (Asia) Plc.

In 4Q18, there was gain from investments of Baht 105 million, decreased by Baht 98 million from 3Q18 and declined by Baht 151 million from 4Q17. This was caused by the lower of equity values in associates.

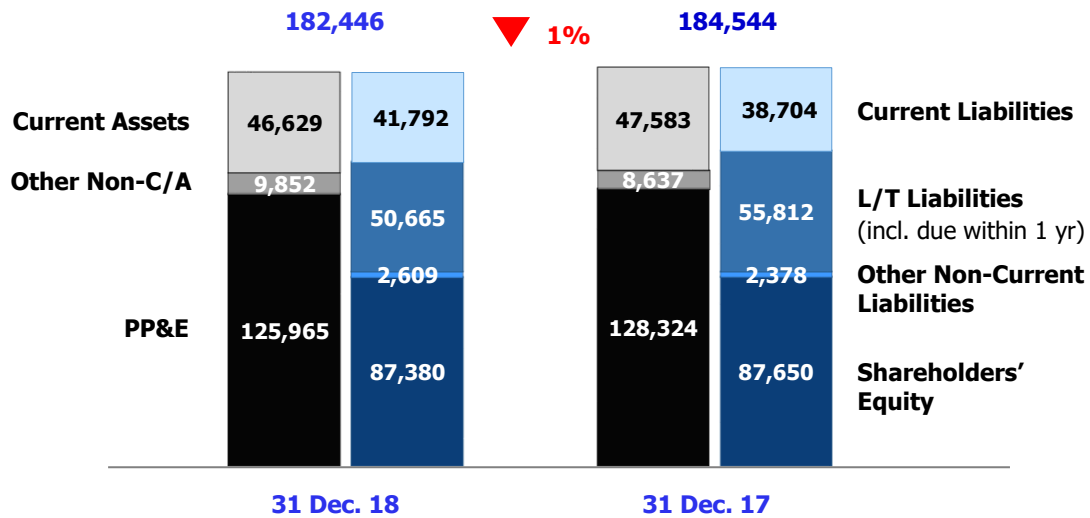
2.10 Corporate Income Tax

For 2018, the corporate income tax of Baht 1,147 million decreased by Baht 1,034 million or 47% from 2017 owing to a decrease in performance as well as an increase in profit from BOI, especially environmental projects.

The corporate income tax in 4Q18 declined by Baht 829 million from 3Q18 because of net loss in 4Q18. When compared with 4Q17, the corporate income tax declined by Baht 1,170 million.

Financial Positions as of 31 December 2018

(Unit: Million Baht)



Assets

As of December 31, 2018, the Company had total assets of Baht 182,446 million, decreased by Baht 2,098 million from December 31, 2017. It was due to the following reasons:

- Account receivables decreased by Baht 587 million or 5% from the end of 2017, mainly due to 7% decrease in product selling prices while 2% increase in volume. As of December 31, 2018, there were overdue more than 3-months account receivables amounting to Baht 32 million or only 0.26% of the total account receivables which incorporated in the provision for doubtful debt of Baht 27 million. The average collection period was 16 days in 2018, compared with 2017 of 19 days.

- Most of inventory consist of finished goods, raw materials and work in process. At the end of 2018, inventory decreased by Baht 1,593 million or 5% mainly due to a decrease in inventory volume from 10.53 million barrels to 9.09 million barrels. The average inventory period was 40 days, compared with 52 days at the end of 2017.

- Other current assets increased by Baht 1,226 million or 26% mainly attributed to an increase in refundable value-added-tax of Baht 856 million and an increase in other account receivables of Baht 206 million.

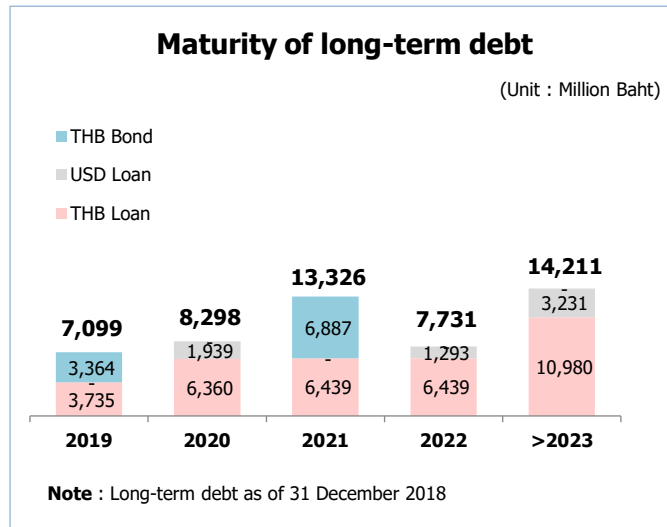
- Non-current assets decreased by Baht 1,144 million or 1% due to an increase of the accumulated depreciation and amortization of fixed assets and land disposal.

Liabilities

As of December 31, 2018, the Company had total liabilities of Baht 95,066 million, decreasing by Baht 1,828 million or 2%, compared to the end of 2017. It was due to the following reasons:

- Short-terms loans from financial institutions increased by Baht 3,743 million or 127% for working capital.

- Account payables increased by Baht 181 million or 1%. It was mainly owing to an increase in crude payables volume. The payment period was 36 days, compared to 43 days at the end of 2017.



- Other current liabilities decreased by Baht 825 million, mainly attributed to a decrease in construction payables of Baht 677 million, a decrease in advance payment for goods of Baht 391 million, while an accrued bonus increased by Baht 225 million.

- Long-term loans including current portion of long-terms loan decreased by Baht 5,147 million, mainly due to loan repayment of Baht 11,651 million, while there was the

long-term loan drawdown of Baht 6,565 million.

The details of long-terms debt are shown below;

(Unit: Million Baht)

	Dec 31, 2018	Dec 31, 2017	Change
Thai Baht Bonds	10,250	15,248	(4,998)
USD Loan	6,463	4,097	2,366
Thai Baht Loan	33,952	36,467	(2,515)
Total	50,665	55,812	(5,147)
less current portion of long-terms loan	(7,104)	(10,660)	3,556
Net Outstanding Debt	43,561	45,152	(1,591)

Note: The Company had currency swap contracts of Cross Currency Swap (CCS), Thai Baht debentures/ long-term borrowing to swap principal from Thai Baht to US dollar and to swap interest rate on Thai Baht principal to interest rate on US dollar principals, and Principal Only Swap (POS), Thai Baht debentures/ long-term borrowing to swap principal from Thai Baht to US dollar, in a total amount of USD 450 million as of 31 December 2018.

- Other non-current liabilities were up by Baht 220 million. This resulted from an increase in employee benefit obligations by Baht 246 million mainly from increasing in employee benefits according to the Company's policy.

Shareholders' Equity

As of 31 December 2018, shareholders' equity was amounted to Baht 87,380 million, which was lower than what was stated as at 31 December 2017 by Baht 270 million. This was mainly from the dividend payment of Baht 7,959 million and a decrease of non-controlling interests due to the status changed of subsidiary to joint venture amounting to Baht 54 million while an increase in net profit amounting to Baht 7,735 million.

Statement of Cash Flow

(Unit : Million Baht)

		2018	2017
1	EBITDA	18,344	20,420
2	Change in operating assets and liabilities	(40)	(174)
3	Net cash flows from (used in) operating activities	18,304	20,246
4	Net cash flows from (used in) investing activities	(6,536)	(9,768)
5	Net cash flows from (used in) financing activities	(11,575)	(10,375)
6	Net increase (decrease)	193	103
7	Cash at beginning	2,145	2,042
8	Cash at ending	2,338	2,145

As of 31 December 2018, the ending cash was Baht 2,338 million. Net cash flow increased by Baht 193 million, which was mainly contributed from the following items;

- Net cash inflow from operating activities of Baht 18,304 million consisted of EBITDA of Baht 18,344 million and changes in the operating assets and liabilities of Baht 40 million. The cash outflows from the operating transactions included an increase in refundable VAT of Baht 883 million. Nevertheless, the cash inflows from operating transactions included a decrease in account receivables of Baht 459 million and a decrease in inventory of Baht 293 million.
- Net cash outflow from investing activities of Baht 6,536 million, mainly from projects such as PP Compounding (PPC) project and Catalyst Cooler project.
- Net cash outflow from financing activities of Baht 11,575 million; mainly from the long-term loan payments of Baht 5,147 million, the interest payment of Baht 2,182 million and the dividend payment of Baht 7,959 million, loss from financial derivatives contracts by Baht 294 million while there were the short-term loans drawdowns of Baht 4,031 million.

Key Financial Ratios

	Unit	Quarter			Year	
		4Q18	4Q17	3Q18	2018	2017
Profitability Ratios						
EBITDA Margin	%	0.77	10.38	7.12	6.54	9.54
Net Profit Margin	%	(2.33)	7.18	3.47	2.76	5.30
Earnings per share	Baht/share	(0.08)	0.22	0.13	0.38	0.56
Return on Equity*	%	8.85	13.48	14.15	8.85	13.48
Liquidity Ratios						
Current Ratio	time	0.95	0.96	1.00	0.95	0.96
Quick Ratio	time	0.30	0.30	0.33	0.30	0.30
Financial Policy Ratios						
Net Debt to Equity	time	0.63	0.65	0.69	0.63	0.65
Net Debt to EBITDA*	time	3.04	2.87	2.49	3.04	2.87

Note: *Annualized

Liquidity and Capital structure

In 2018, current ratio was 0.95 times, closed to 2017 level of 0.96 times. The Company has sufficient liquidity for its operations. At the end of 2018, net debt to equity ratio was 0.63 times, decreasing by 0.02 times from 2017. This was mainly due to loan repayments in 2018. The Company could complete all payments on due date and comply with all of the Financial Covenants.

In 4Q18, current ratio was 0.95 times, decreasing by 0.05 times compare with 3Q18. This was mainly due to a decreasing in inventory volume. At the end of 4Q18, net debt to equity ratio was 0.63 times, decreasing by 0.06 times compare with 3Q18 because of a decrease in short-term loan.

Note:

Account receivable turnover	=	Sales / Average account receivable before doubtful account
Collection period	=	360 / Account receivable turnover
Inventory turnover	=	Cost of Goods Sold / Average Inventory
Inventory period	=	360 / Inventory turnover
Account payable turnover	=	Cost of sales / Average account payable
Payment period	=	360 / Account payable turnover
EBITDA margin	=	EBITDA / Revenue from Sales
Profit margin	=	Net Profit / Revenue from Sales
Return on equity	=	Net Profit / Average shareholders' equity
Current ratio	=	Current assets / Current liabilities
Quick ratio	=	(Cash + Marketable Securities + Account Receivable) / Current Liabilities
Net Interest bearing Debt to Equity	=	(Interest bearing Debt – Cash) / Total Equity
Net Interest bearing Debt to EBITDA	=	(Interest bearing Debt – Cash) / EBITDA

2019 Business Outlook

1. Petroleum Business

Crude oil price in 2019 is expected to increase from 2018 Year End price and move in the range of USD 60-68 per barrel, has encouraged by an easing of the U.S. - China trade war intensify after trade negotiations between the two countries are positive. The crude oil demand is forecasted to expand by 1.1-1.3 million barrels per day. Meanwhile, Saudi Arabia is likely to reduce the additional crude oil exports in order to balance the market in addition to the production cuts agreement among OPEC on Non-OPEC countries by 1.2 million barrels per day after the meeting on December 7, 2018. However, crude oil price remains under pressure from the increasing level of the U.S. crude oil inventory expectations amid growing the U.S. output. Furthermore, there are long-term factors that need to be watched such as green energy policy and new oil standards from IMO. And also, the digital technology that play an important role in the energy industry throughout the supply chain which may cause the changing consumer behavior and switching demand for energy.

2. Petrochemical Business

In 2019, Petrochemical business tends to be more favorable when compare to last year situation especially Styrenics products because the concern over trade war between the U.S. and china has been relief. China is the world's largest demand country for Styrenics products since it is one of the major producer for electronic equipment, electrical appliances and automobile. Plus, the Chinese RMB value is more stable than last year, leading to the higher demand for polymers and also the slightly increase in Petrochemical new capacity helped support its price.

Likewise, Polypropylene products are expected to be increased. According to forecasts, the new capacity for the year 2019 is approximately 2.5-3.0 million tons which is lower than the increasing demand as the development of the digital age changes, resulting in more plastic products consumption. Including the government supporting on long-time used vehicles reduction and promote the electric vehicles to reduce environmental problems which will increase plastic demand. Moreover, the unplanned shutdown plants in the Middle East helps to keep prices at a high level. For Polyethylene products, it is expected to be pressured by new capacity that has increased considerably over the past 2-3 years, especially from the U.S. while the demand is likely to grow at a lower rate due to the lower growth of global economy.

Nevertheless, there are other major factors, such as the level of crude oil price, the Asia and global economic growth including the political stability of producing countries that also impact the industry.

Investment Projects

1. Investment Project Progress

1.1 The value-added projects for UHV

After the UHV Project completed, the Company initiates the value-added projects for UHV including Gasoline Maximization Project and UHV Catalyst Cooler Project. The progress of projects are as follows:

- Gasoline Maximization Project: The objective is to increase Gasoline production approximately 25 million litres per month in order to capture the domestic market. The project has started commercial operation since November 2017. In 2018, the Company is able to increase more Gasoline production volume than designed.
- UHV Catalyst Cooler Project: The objective is to enhance the production efficiency by using more heavy crude oil and to reduce heat in the Catalyst Regenerator. The project is currently under construction and targeted to be COD by 1Q19.

1.2 Everest Project and Everest Forever Project (E4E)

The objective of Everest Project is to improve the core competencies as well as the organization and human resource development by applying the best practices and strengthening organization health. In 2018, Everest Project could contribute the EBIT of Baht 7,970 million. Furthermore, IRPC has launched Everest Forever Project (E4E) to top up on Everest Project and add more benefit by USD 100 million or Baht 3,300 million per yer.

1.3 IRPC 4.0 Project

IRPC 4.0 Project is to apply modern digital and technology in order to enhance the efficiency of operational organization and develop customer service thru digitization. There are five key areas as following:

- (1) OPS 4.0: To increase operating efficiency being Smart Operation and provide the planning and monitoring system thru Artificial Intelligent (AI).
- (2) CCM 4.0: To increase sales and marketing efficiency via Customer Centric Digital in order to access to the customers' demand with rapidly response.
- (3) ISC 4.0: To provide smart program for the raw materials purchasing and production planning. This program also be able to analyze customer behavior and manage delivery activities along the supply chain management.
- (4) PRO 4.0: To improve procurement system and competitiveness thru the lower of procurement cost and time, the lower of duplication work, and the increase of procurement planning efficiency.

- (5) ERP 4.0: To restructure the Information Technology (IT) in relation with the transformation to digitization. It will be focusing on database remodeling and increase infrastructure capability to be IT excellence.

2. Investment Plan

The Board of Directors meeting no. 11/2018 has approved the Company's 5-year investment plan (2019- 2023) including the committed capital expenditure (CAPEX) amounting to Baht 71,043 million as well as CAPEX for investment opportunities amounting to Baht 34,141 million. The committed CAPEX contributes to projects for the implementation of the "GDP" strategic plan; Power of **G**rowth, Power of **D**igital, Power of **P**eople. The objective is to encourage the Company's business growth with the excellent organization and to develop the employee's capability for sustainable growth. The major investment plans are including:

- (1) MARS or Maximum Aromatics Project; for Para-xylene and Benzene production which is value-added upon existing feedstock thru smart technology in order to increase cost competitiveness.
- (2) General and Maintenance Projects; which includes Major Turnaround CAPEX in 2022 as being planned every 5 years.
- (3) Strategic Investment Projects are mainly for products upgrading preparation in order to meet the Euro 5 standards.
- (4) E4E and IRPC 4.0: E4E is ongoing project of the "EVEREST", the efficiency improvement project. Whereas, IRPC 4.0 project is the integration of digital system and innovations throughout the Company's supply chain.

(Unit : Million Baht)

Investment Projects*	2019	2020	2021	2022	2023	Total
(1) MARS Project	4,034	9,532	16,256	10,765	616	41,203
(2) General and Maintenance Projects	2,481	2,912	2,743	4,782	2,821	15,739
(3) Strategic Investment Projects	642	533	4,103	3,314	-	8,592
(4) E4E and IRPC 4.0 Projects	1,924	387	-	-	-	2,311
(5) Others	2,235	723	108	83	49	3,198
Total	11,316	14,087	23,210	18,944	3,486	71,043

Note: *Excluding capex for investment opportunities amounting to Baht 34,141 million