

**RELATIVE VALUATION OF IRPC PUBLIC COMPANY LIMITED**

**PANYAVIT CHATTANRASSAMEE**

A large, faint watermark of the Mahidol University logo is centered on the page. The logo is circular with a blue background and a gold border. It features a central golden emblem of a traditional Thai stupa or chedi. The Thai text 'มหาวิทยาลัยมหิดล' (Mahidol University) is written in a circular path around the emblem.

**A THEMATIC PAPER SUBMITTED IN PARTIAL  
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**RELATIVE VALUATION OF IRPC PUBLIC COMPANY LIMITED**

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**ABSTRACT**

We issue a SELL recommendation on IRPC Public Company Limited with a one-year target price of THB 1.52 determined by the Discounted Free Cash Flow to Firm Method with WACC at 10.83% and terminal growth rate 1.54%. The intrinsic value is lower than the current market price THB 3.62 as at 13 December 2019.

In Multiple Band Ranking of relative valuation method; we ranked all 8 factors, noted this will also included share price and Enterprise Value as well. We had 4 Undervalued factors (Share Price, forward P/E, trailing P/BV, forward EV/EBITDA) & 4 Overvalued factors (Enterprise Value, trailing P/E, forward P/BV, trailing EV/EBITDA). So Multiple Band had equally between Undervalued & Overvalued. Next, Selected Peer 5 yrs Median Ranking, relevant data can be applied only to trailing relative valuation method only, it does not work with Share Price, Enterprise Value, nor any type of forward multiple. As it ranked, 1 Undervalued factor & 2 Overvalued factors. Then for Oil & Gas T12M Median Ranking, same idea as Selected Peer 5 yrs Median Ranking, can apply to only trailing relative valuation, which yield all 3 Overvalued factors. All in all, 6 Undervalued indicators vs 10 Overvalued indicators; with relative valuation method, we would recommend SELL on IRPC Public Company Limited

**KEY WORDS:** IRPC/ Relative Valuation/ Refinery/ Multiples/ Crude Oil

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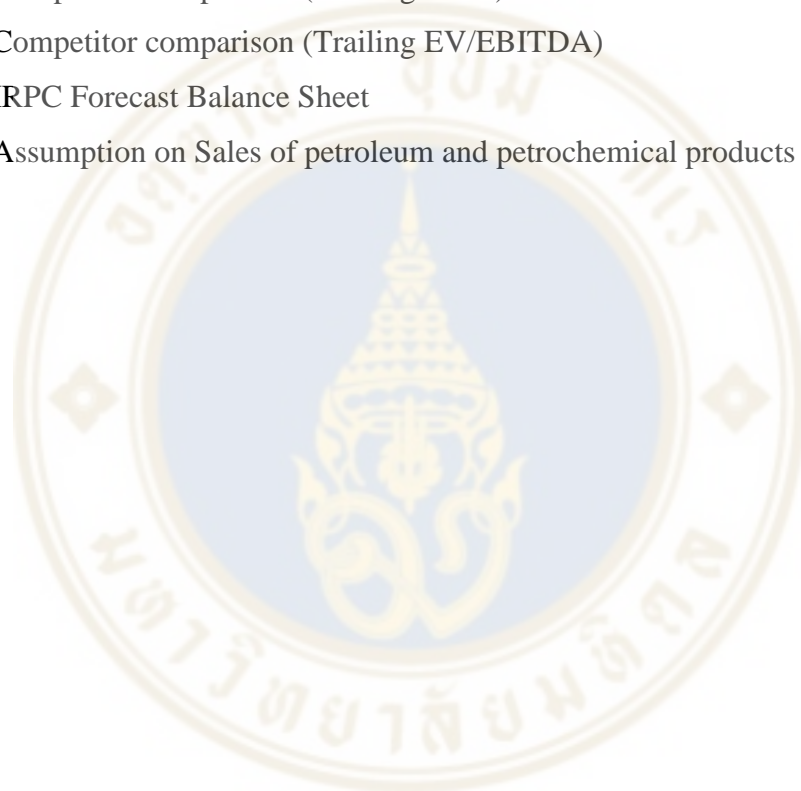
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## CHAPTER I VALUATION

### 1.1 Highlight

We issue a SELL recommendation on IRPC Public Company Limited with a one-year target price of THB 1.52 determined by the Discounted Free Cash Flow to Firm Method with WACC at 10.83% and terminal growth rate 1.54%. The intrinsic value is lower than the current market price THB 3.62 as at 13 December 2019.

According to the negative EBIT as of 30 September 2019, from fluctuation of oil price, Thai baht appreciation that caused loss in oil stock, external factors from pressure of trade war, the company performance and stock price definitely dropped since the year 2018 to quarter 3 2018 plus the slow pace of industry growth in the future and difference in the value we get from discounting forecasted cashflow to the market share price, we would like to recommend the investors “sell” the stock and look for other stocks to invest.

**Table 1.1 IRPC performance**

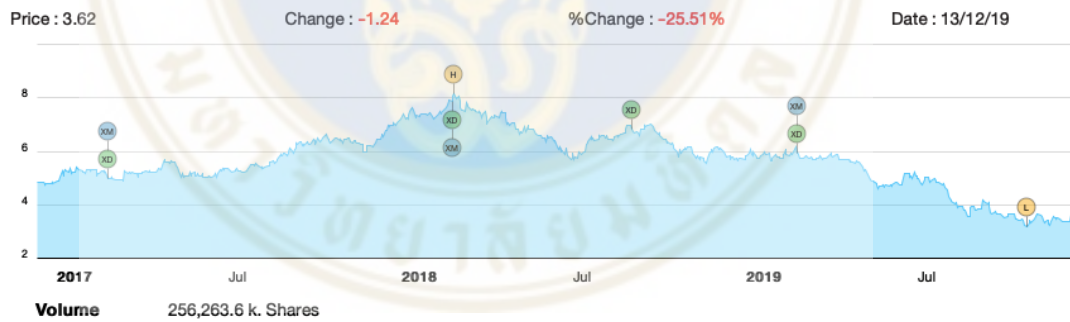
Period as of	Y/E '15 31/12/2015	Y/E '16 31/12/2016	Y/E '17 31/12/2017	Y/E '18 31/12/2018	Q3 '19 30/09/2019
<b>Financial Data</b>					
Assets	163,173.67	172,377.85	184,543.83	182,445.66	177,919.96
Liabilities	87,295.73	91,372.88	96,893.83	95,066.03	93,005.35
Equity	75,804.42	80,919.87	87,512.69	87,286.11	84,776.56
Paid-up Capital	20,434.42	20,434.42	20,434.42	20,434.42	20,434.42
Revenue	218,519.36	186,068.58	216,845.73	282,750.80	185,974.44
Net Profit	9,401.76	9,720.83	11,354.48	7,734.99	-660.88
EPS (Baht)	0.46	0.48	0.56	0.38	-0.03
<b>Financial Ratio</b>					
ROA(%)	8.74	6.81	8.75	5.93	-0.59
ROE(%)	13.09	12.41	13.48	8.85	-2.63
Net Profit Margin(%)	4.30	5.22	5.24	2.74	-0.36

Source: SETtrade data (n.d.)

**Table 1.2 IRPC market profile**

<b>Closing price</b>	THB 3.62
<b>52-week Price Range</b>	THB 6.20 / 3.14
<b>Trailing P/E</b>	N/A
<b>P/BV</b>	THB 0.87
<b>EPS</b>	THB -0.03
<b>ROE</b>	2.63%
<b>Share Outstanding</b>	THB 20,434,419,246
<b>Dividend per share</b>	THB 0.09
<b>Dividend yield</b>	5.25%
<b>Market Cap.</b>	THB 73,972.60 million
<b>Book value per share</b>	THB 4.15

Source: SETtrade data (n.d.)

**Figure 1.1 IRPC daily price history**

Source: SETtrade data (n.d.)

Table 1.3 IRPC Q3 income statement

	Unit : Million Baht				
	Quarter			9 months	
	3Q19	3Q18	2Q19	2019	2018
Average FX (THB/USD)	30.88	33.15	31.76	31.47	32.31
Total Crude Intake (Mbbbl)	17.73	18.68	18.78	54.48	56.96
Average Crude (USD/bbl) <sup>(1)</sup>	64.79	77.13	70.15	66.93	73.32
Sales <sup>(2)</sup>	60,127	73,819	63,710	183,557	210,815
Net Sales <sup>(3)</sup>	54,264	68,831	57,702	166,240	194,686
Cost of Feedstock (Market Price)	(48,701)	(61,164)	(52,273)	(150,290)	(169,957)
<b>Market GIM</b>	<b>5,563</b>	<b>7,667</b>	<b>5,429</b>	<b>15,950</b>	<b>24,729</b>
Stock Gain/(Loss)	(1,320)	1,017	176	(1,266)	3,389
Lower of Cost or Market	148	-	(148)	841	(7)
Oil Hedging Gain/(Loss)	(161)	54	463	303	108
<b>Accounting GIM</b>	<b>4,230</b>	<b>8,738</b>	<b>5,920</b>	<b>15,828</b>	<b>28,219</b>
Other Incomes <sup>(4)</sup>	361	371	723	1,506	1,145
Selling Expenses	(380)	(375)	(366)	(1,111)	(1,120)
<b>Accounting GIM and Other Incomes</b>	<b>4,211</b>	<b>8,734</b>	<b>6,278</b>	<b>16,223</b>	<b>28,244</b>
OPEX	(3,473)	(3,475)	(3,974)	(10,826)	(10,435)
<b>EBITDA</b>	<b>738</b>	<b>5,258</b>	<b>2,304</b>	<b>5,397</b>	<b>17,809</b>
Depreciation	(2,173)	(2,046)	(2,135)	(6,324)	(6,132)
<b>EBIT</b>	<b>(1,435)</b>	<b>3,212</b>	<b>169</b>	<b>(927)</b>	<b>11,677</b>
Net Financing Cost	(486)	(500)	23	(850)	(1,409)
Gain/(Loss) from Foreign Exchange	30	57	213	370	82
Gain/(Loss) from impairment and disposal of fixed assets	122	(5)	(2)	112	46
Gain/(Loss) from Investment	108	203	112	303	575
Other Expenses	18	(2)	5	18	(2)
<b>Net Profit/(Loss) before Income Tax</b>	<b>(1,643)</b>	<b>2,965</b>	<b>520</b>	<b>(974)</b>	<b>10,969</b>
Income Tax	330	(395)	(5)	334	(1,581)
Gain/(Loss) from non-controlling interests	(8)	(10)	(8)	(21)	(26)
<b>Net Profit/(Loss)</b>	<b>(1,321)</b>	<b>2,560</b>	<b>507</b>	<b>(661)</b>	<b>9,362</b>
<b>Earning per share (EPS) (Baht/ share)</b>	<b>(0.06)</b>	<b>0.13</b>	<b>0.02</b>	<b>(0.03)</b>	<b>0.46</b>

Source: IRPC Annual Report 2018

Sell recommendation, expected downward trend of IRPC stock value.

As the main product of the company is petroleum product which is now in the downward trend as there will be less demand of oil in the future (Source from OPEC) and almost half of revenue of IRPC is from exports which now facing the risk of exchange rate from Thai baht appreciation, while the revenue is expected to be slowed, the cost of the company will remain high which will cause the loss, as of September 2019 financial statement, the company loss is -1,321 in quarter 3 and -3,374 for accumulated 12 trailing months.

## 1.2 Business Description

IRPC Public Company Limited or IRPC (Company) was named as “Thai Petrochemical Industry Public Company Limited” or "TPI" before until registered in 1978 by Leophairatana family. They became public company limited on 10 October 1994 and being listed on the SET by 17 March 1995. Their main business is to produce applications of petroleum and petrochemical products which later diversify to many other related products, using its infrastructures for integrated petrochemical complex. They have up and down, such as they faced financial crisis in 1997 and being in rehabilitated process in 2000, which later succeeded in 26 April 2006. Currently, they have plants located in Rayong Province, included such as deep seaport, tank farm and power plant.

### 1.2.1 IRPC’s Business strategy

#### **“Pursuit the sustainable success” – IRPC Quotation of success**

IRPC continued to thrive for the better, their aim was and is still to be ‘Big’ in term of revenue growth at 5% and EBITDA growth at 10% yearly, also aim to be ‘Strong’, being 1<sup>st</sup> in Quartile ROIC in Petroleum and Petrochemical Industry, as well as ‘Long’ term member of DJSI in emerging market universe too. They tend to improve themselves in many aspects such as production operation, business operation, research & development operation, information technology operation, financial operation, legal operation, and human resource operation.

#### **Vision**

Leading Integrated Petrochemical Complex in Asia by 2020

### **Mission**

Operating excellence, High performance organization, CSR, Value creation, Innovation & creation of new business

### **Value**

- INDIVIDUAL OWNERSHIP SYNERGY
- PERFORMANCE EXCELLENCE INNOVATION
- RESPONSIBILITY FOR SOCIETY INTEGRITY & ETHICS
- TRUST & RESPECT

Overall, they have high aim and specific goal, according to their annual report in 2018, they aim to be 'become the leading petrochemical complex in Asian by 2020'. They also persuaded growth mindset, usage of digital technology, focus on giving power to their people & personnel. They also received many awards on monthly basis during 2018.

Source: IRPC Annual Report 2018

### **1.2.2. Shareholder Structure**

As at September 30, 2019, the company's paid up capital is Baht 20,434,419,246 divided into 20,434,419,246 ordinary shares at par value 1 Baht per share.

PTT Public Company Limited is the major shareholder of the Company, holding 47.55%. Another shareholder is Thai NVDR Company Limited holding 7.93%.

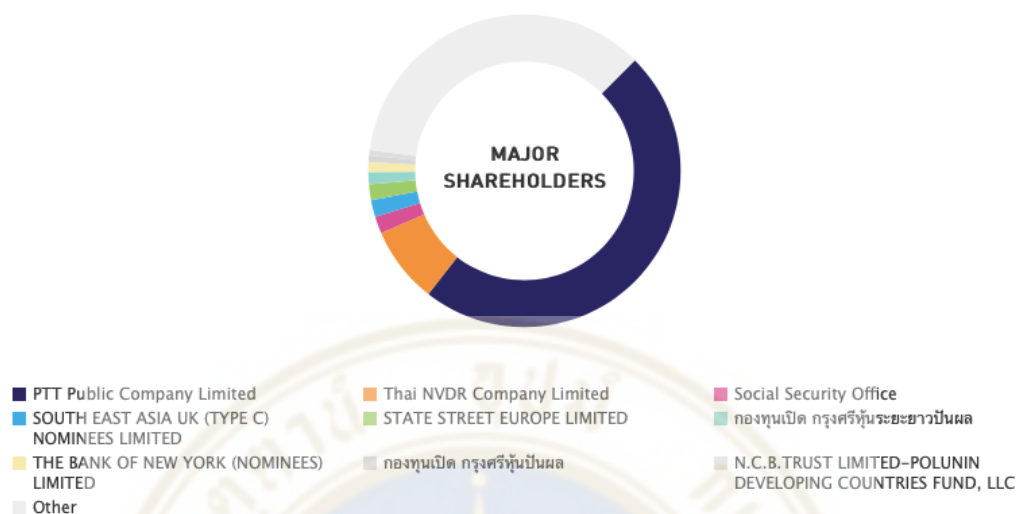
As the biggest shareholder of IRPC is PTT, there are collaboration between IRPC and PTT and its subsidiaries for enhancing efficiency and reducing cost in crude oil procurement.

- PTT secures 100% crude procurement for IRPC at the market price and provides 60 days credit term to IRPC.
- Petroleum Product off-take and swap agreement with PTT group on arm-length basis
- Strong support of credit facilities from PTT thru Intercompany Borrowing & Lending (ICBL) program
- IRPC are under umbrella of PTT group's central treasury management framework



## Major Shareholders

IRPC's top 9 shareholders at latest share registration book closing date for dividend payment on 27 February 2019 are as follows :



**Figure 1.2 Major Shareholders**

Source: IRPC website

**Table 1.4 Major Shareholders**

1	PTT Public Company Limited	9,819,694,600	48.05%
2	Thai NVDR Company Limited	1,621,252,579	7.93%
3	Social Security Office	360,851,700	1.77%
4	SOUTH EAST ASIA UK (TYPE C) NOMINEES LIMITED	357,102,861	1.75%
5	STATE STREET EUROPE LIMITED	335,602,294	1.64%
6	KFLTFDIV กองทุนเปิด กรุงศรีหุ้นระยะยาวเป็นผล	252,999,100	1.24%
7	THE BANK OF NEW YORK (NOMINEES) LIMITED	209,435,175	1.02%
8	KSFDIV กองทุนเปิด กรุงศรีหุ้นปันผล	139,462,500	0.68%
9	N.C.B.TRUST LIMITED-POLUNIN DEVELOPING COUNTRIES FUND, LLC	118,549,851	0.58%

Major Shareholders mainly owned by PTT Public Company Limited, some of equity are also owned Thai NVDR Company Limited. Then minority equity holder between 0.5 – 2% are those such as banking, mutual funds, and financial institution both in Thailand and outside Thailand.

### 1.2.3 Investments In subsidiaries, joint ventures and associates

As the Table 1.2.3 IRPC investment shown below, IRPC also have their Subsidiaries, Investment in other Company, Joint Ventures, and Associates. Their focus are still mainly on oil products, gas, petrochemical products, and chemical products. But also, diversify to other type of business such as estate development, Engineering consulting, and Manufacturing and sales of electricity and steam

**Table 1.5 IRPC investment**

	Business type	Percentage of shareholdings (%)	
		June 30, 2019	December 31, 2018
<b><u>Subsidiaries</u></b>			
IRPC Oil Co., Ltd.	Sales of oil products and gas	99.99	99.99
IRPC Technology Co., Ltd.	Vocational school	99.99	99.99
IRPC A&L Co., Ltd.	Distributing petrochemical products	59.98	59.98
I-Polymer Co., Ltd.	Distributing plastic resin and chemical products via E-Commerce system	99.99	99.99
<b>Indirectly invested by IRPC Oil Co., Ltd.</b>			
Rakpasak Co., Ltd.	Oil vessel renting	99.99	99.99
<b><u>Joint Ventures</u></b>			
WHA Industrial Estate	Industrial estate	40	40
Rayong Co., Ltd.	development		

**Table 1.5 IRPC investment (cont.)**

IRPC Polyol Co., Ltd.	Manufacturing and sales of chemical products for polyurethanes	50	50
<b><u>Associates</u></b>			
PTT Energy Solutions Co., Ltd.	Engineering consulting	20	20
UBE Chemicals (Asia) Public Co., Ltd.	Manufacturing and sales of petrochemical products	25	25
IRPC Clean Power Co., Ltd.	Manufacturing and sales of electricity and steam	48.99	48.99

Source: IRPC Annual report 2018

### 1.2.4 Business structure

IRPC and subsidiaries has revenue from Petroleum 71% of total revenue which the main products are Gasoline, Fuel oil, Lube base, and asphalt, revenue from Petrochemical 28% mainly from Olefins, Aromatics, and Polymers, and revenue from other businesses 1% mainly from Power plant.

Type of Business	Operations/ % of shares held by IRPC	2016		2017		2018	
		Million Baht	%	Million Baht	%	Million Baht	%
1. Petroleum	IRPC Plc IRPC Oil Co., Ltd. (99.99%)	113,152	67%	135,125	68%	182,953	71%
2. Petrochemical	IRPC Plc IRPC A&L Co., Ltd. (59.98%) IRPC Polyol Co., Ltd. <sup>(1)</sup>	52,115	31%	59,728	30%	72,740	28%
3. Other business <sup>(2)</sup>	IRPC Plc	3,082	2%	2,741	2%	3,227	1%
<b>Total net sales revenue</b>		<b>168,349</b>	<b>100%</b>	<b>197,594</b>	<b>100%</b>	<b>258,919</b>	<b>100%</b>
Profit (loss) sharing from investment in associated companies and shareholding in joint-venture companies		125		388		679	
Percentage of revenue Domestic : Overseas		58% : 42%		57% : 43%		57% : 43%	

**Figure 1.3 Type of business**

Source: IRPC Annual report 2018

The company group has 3 main businesses: Petroleum business, Petrochemical business, and Supporting business.

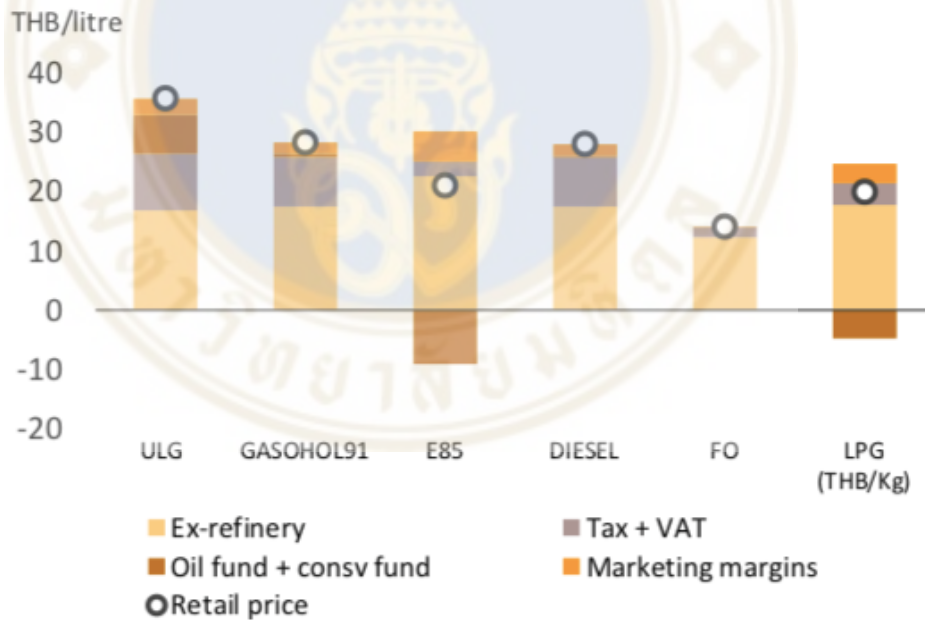
**Petroleum business by IRPC Oil Co., Ltd**

IRPC’s refinery is in Rayong. Petroleum products from the refinery consisted of various kinds of refined oil; naphtha, diesel, gasoline, lube base oil, fuel oil, asphalt. IRPC Oil refines Petroleum and distributes product through Rak Phasak Co., Ltd which provides Marines transportation services.

The ex-refinery prices are based on Singapore International Monetary Exchange (SIMEX) which called Mean of Platts Singapore (MOPS) using Import Price Parity basis for setting ceiling ex-refinery prices.

This is calculated from Singapore price (FOB) + transportation.

The price structure is not only depending on Ex-refinery price. There are other factors as the chart below.



Source: EPPO, Krungsri Research (as of Dec 28, 2018)

**Figure 1.4 Oil Price structure**

Source: Krungsri Research Thailand Industry Outlook 2019-2021 for Refinery Industry

The profitability of the refinery business is based on Gross Refinery Margins: GRM which is calculated from total value of refinery product deduct by total per barrel.

Gross refinery margins are based on these factors;

1. Crude oil

GRM will increase with these 2 conditions:

- Demand of petroleum products expands leading to higher crude oils. This will cause the petroleum products increase more than the crude oil price.
- Supply of crude oil price increases. This will pressure the crude oil price to decrease more than the price of petroleum products.

2. Petroleum products price

3. Capacity Utilization

Petroleum	Quarter			% Change		9 months		YoY
	3Q19	3Q18	2Q19	YoY	QoQ	2019	2018	
<b>Crude Intake</b>								
Million barrels	17.73	18.68	18.78	(5%)	(6%)	54.48	56.96	(4%)
KBD	193	203	206	(5%)	(6%)	200	209	(4%)
<b>Utilization Rate</b>								
Refinery	90%	94%	96%	(4%)	(6%)	93%	97%	(4%)
RDCC	113%	75%	114%	38%	(1%)	99%	95%	4%
Lube Base Oil	79%	82%	82%	(3%)	(3%)	82%	85%	(3%)

**Figure 1.5 Capacity Utilization**

Source: IRPC Q3 MD&A presentation

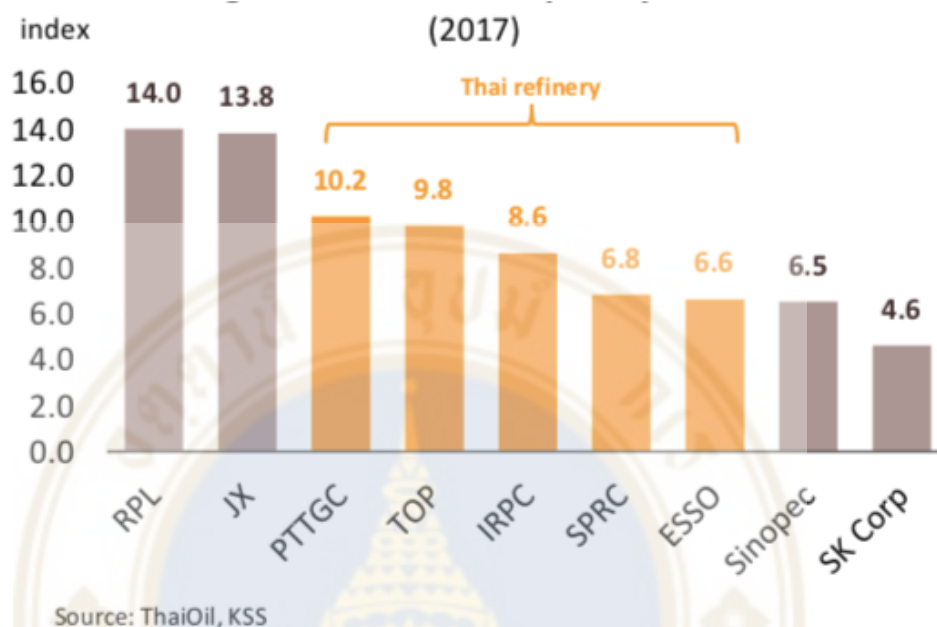
In 3Q19, crude intake was 17.73 million barrels or 193,000 barrels per day (193 KBD). The utilization rate was 90%, decreasing by 6% when compared with 2Q19 of 96% utilization rate. This was caused by the ADU1 unit's planned maintenance shutdown approximately 2 weeks for cleaning and inspection of heat exchanger. The utilization rate of RDCC plant in 3Q19 was 113%, almost the same level with 2Q19 of 114% utilization rate. The utilization rate of lube base oil plant in 3Q19 was 79%, decreasing by 3% from 2Q19 and 3Q18 of 82% utilization rate. This was resulted from a maintenance shutdown of the lube base improvement equipment.

4. Higher Nelson Complexity Index (NCI)

The Nelson Complexity Index (NCI) is type of measurement of the oil refinery which can determine whether the crude oil can produce either light, heavily, &

other products from the crude oil. They needed to use this indication due to compare between peers and return on investment to their capital, the higher NCI, the higher cost to invest and operation.

Source: <https://www.investopedia.com/terms/n/nelson-index.asp>



**Figure 1.6 Nelson Complexity Index 2017**

Source: Krungsri Research Refinery Industry outlook 2019-2021

## 5. Crude oil procurement and source management

### Company Business capacity

#### 1. Petroleum Capacity

From table 1.2.2, it can be states that they peaked their consumption of crude oil in 2018, say if whole 2019 is involved, intake crude will be  $54.48 / 3 = 18.16$  Million barrels, then \*4 to make to yearly, which is 72.64 Million barrels, forecasted 2019 is lower than 2018. Same thing can be assumed to forecasted 2019 Sale by Volume as well, which  $43.95 / 3 * 4 = 58.6$  Million barrels, lower than 2018 as well.

**Table 1.6 Petroleum Capacity**

	<b>9M 2019</b>	<b>2018</b>	<b>2017</b>
Crude intake			
Million barrels	54.48	76.05	65.54
KBD	193	208	180
Utility rate			
Refinery	93%	97%	84%
RDCC (Residue Deep Catalytic Cracking)	99%	99%	80%
Lube base oil	82%	85%	76%
Sales Volume (Million Barrel)			
Refinery	43.95	60.83	52.39
Lube base oil	5.20	7.01	6.43

Source: MD&A presentation (n.d.)

## 2. Petrochemical business

Manufactured and Distributed Petrochemical products; Olefins, Aromatics, Polyolefins, Styrenics by company subsidiaries and affiliates below;

IRPC Polyol Co.,Ltd (Affiliates) manufactures and distributes Polyol

IRPC A&L Co.Ltd (subsidiaries) distributes Stryenics

Ube Chemical (affiliates) manufactures and distributes Petrochemical products

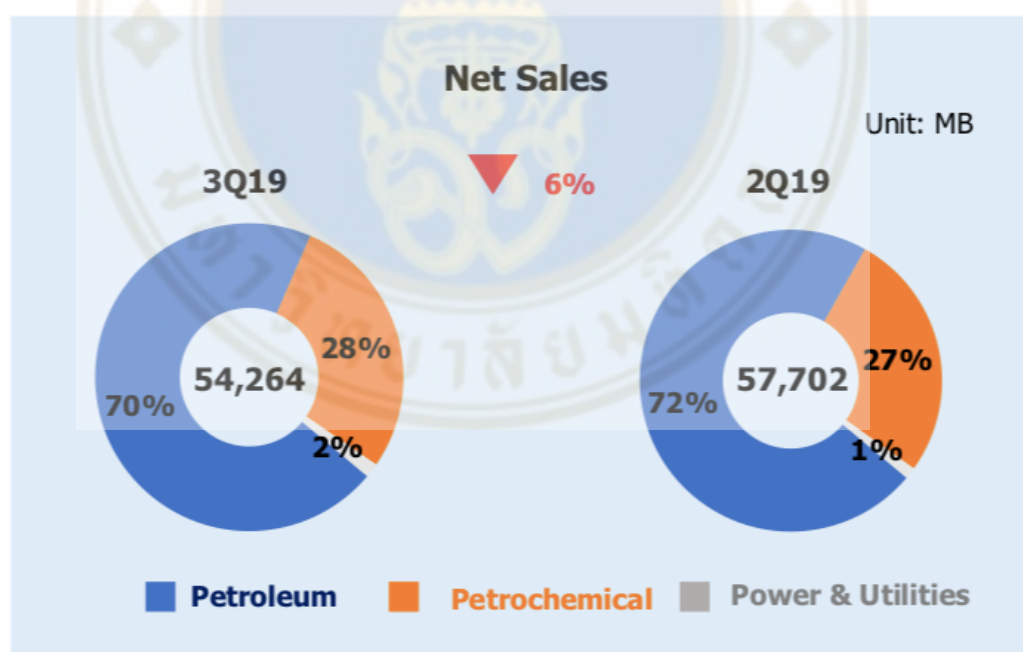
**Table 1.7 Petrochemical Capacity**

Utility rate	<b>9M 2019</b>	<b>2018</b>	<b>2017</b>
Olefins	96%	94%	87%
Aromatics and Strynics	92%	101%	90%
<b>Sales Volume (Million Barrel)</b>			
Olefins	851	1,107	952
Aromatics and Strynics	534	728	631

Source: MD&A presentation (n.d.)

### 3. Supporting Business

Provide power and public utilities, port and tank services, and asset management business by IRPC Technology (subsidiaries) running vocational school, IRPC Clean Power (affiliates) manufacture and distribute electricity and stream, and PTT Energy Solution (affiliates) provide engineering solutions.



**Figure 1.7 Net sales of Quarter 3 2019 VS Quarter 3 2018**

Source: Q3 MD&A presentation (n.d.)



### **1.2.5 Investment Opportunity**

#### **1. Catalyst Cooler**

Company invested in Catalyst Cooler of 1,320 Million Baht to enhance the ability of selecting heavy crude. This project could lead to higher gross integrated margin of 0.3\$ per barrel.

The expected time of completed the construction progress is in Aug 2019 which will provide higher capacity of manufacturing Electricity and Stream.

#### **2. Low Sulfur Fuel Oil Project**

The project approximately value 3 million USD. It already completed in May 2019. It could produce higher benefit than high Sulfur fuel oil of 100 USD per ton. The company has capacity of manufacturing low Sulfur fuel oil of 60,000 ton per month.

#### **3. Investment in Plastic product E-commerce business in China**

The company invest in E-commerce China company called “Guangzhao Saiju Performance Polymer” (GZSJ), a distributor of Plastics Pellets to Local Chinese SMEs on e-commerce platform called “IPLAS”. IRPC invested of 15%. or 650 million Baht in GZSJ. The investment is expected to be completed in Sep 2019.

#### **4. Set-up new company in Thailand (investment size of 120 MB)**

IRPC and GZSJ become a joint venture setting up a new company in Thailand named iPolymer Ltd. IRPC holds 55% and GZSJ hold 45% of shares in iPolymer Ltd.

iPolymer is e-commerce company selling plastic in Thailand on website [www.plastket.com](http://www.plastket.com) starts in Oct 2019

#### **5. Joint venture with WHA: WHA Industrial Estate Rayong**

The company hold 40% while WHA hold 60% of shares. Expected that in Q3, the Joint venture will be fully paid up capital and the land sales will start in 2021.

## **1.3 Macro-Economic Analysis, Industry Analysis, Competitor Analysis**

### **1.3.1 Macroeconomic Analysis**

#### 1.3.1.1 Overall Economy; world, Thailand

World Economy has a sign that it would be slowly decline in growth, due to trade tension between U.S. and China, which affected the trade volume and investor confidence. Although, with Thailand's potential of labor markets and consumer confidence, Bank of Thailand expected that growth projection of Thailand's trading partner economies will be at 3.0% for 2019 and 2.8% for 2020. Major Economy that are Thailand's trading partner, they are as following: Asian Economy (excluding Japan and China)(weighted of 34.2%), Chinese Economy (weighted of 17.1%), U.S. Economy (weighted of 15.9%), Japanese Economy (weighted of 14.1%), European Economy (weighted of 10.3%).

For detailed Economy explanation are following. Asian economies (excluding Japan and China) are expected to constant growth, although may slowly growth because merchandise export are shrink due to global trade volume and certain country such as Philippines' government budget and Indonesia's public investment are lower. Chinese Economy are expected to constant growth, with their expansion of manufacturing sector and merchandise exports, including government supportive regulation, but lower in global trading volume. In sum, it has steady growth. There are 4 namely factors for U.S. Economy are (a) strong labor market, (b) larger fiscal stimulus, (c) declining imports, and (d) inventory accumulation. For Japanese Economy, are expected to grow high because inventory accumulation and import reduction. Lastly, for European Economy are expected to go lower because manufacturing sector and producer confidence are going downtrend.

For Thai Economy, also expected to grow slower at 3.3% for 2019 and 3.7% for 2020, because external demand of merchandise and service export is projected at lower than their pervious report. Also, with private consumption and investment are expected to remain constant, but government spending would still assist on growth of Thai Economy.

Source: BOT Monetary Policy Report (full version), June 2019

**Table 1.8 of Population, GDP, and inflation (World vs Thailand)**

		2013	2014	2015	2016	2017 r	2018 r
World	Population (Million persons)	7,211	7,295	7,380	7,464	7,548	7,631
	(% change)	1.2%	1.2%	1.2%	1.1%	1.1%	1.1%
Thailand	Population (Million persons)	64.79	65.12	65.73	65.93	66.19	66.19
	(% change)	0.5%	0.5%	0.9%	0.3%	0.4%	0.0%
World	GDP : Real (billion USD)	71,688	73,725	75,834	77,797	80,250	N/A
	(% change)	2.7	1.0	3.1	3.4	4.0	N/A
Thailand	GDP : Real (billion baht)	9,142.1	9,232.1	9,521.4	9,841.0	10,237.0	10,660.1
	(% change)	2.7	1.0	3.1	3.4	4.0	4.1
World	Inflation (% change)	3.70%	3.20%	2.80%	2.80%	3.20%	3.60%
Thailand	Inflation (% change)	2.20%	1.90%	-0.90%	0.19%	0.66%	1.07%

Source: Bank of Thailand; Thailand's Macro Economic Indicators

Source: World Bank - World Bank national accounts data, and OECD National Accounts data.

### 1.3.1.2 GDP growth; world, Thailand

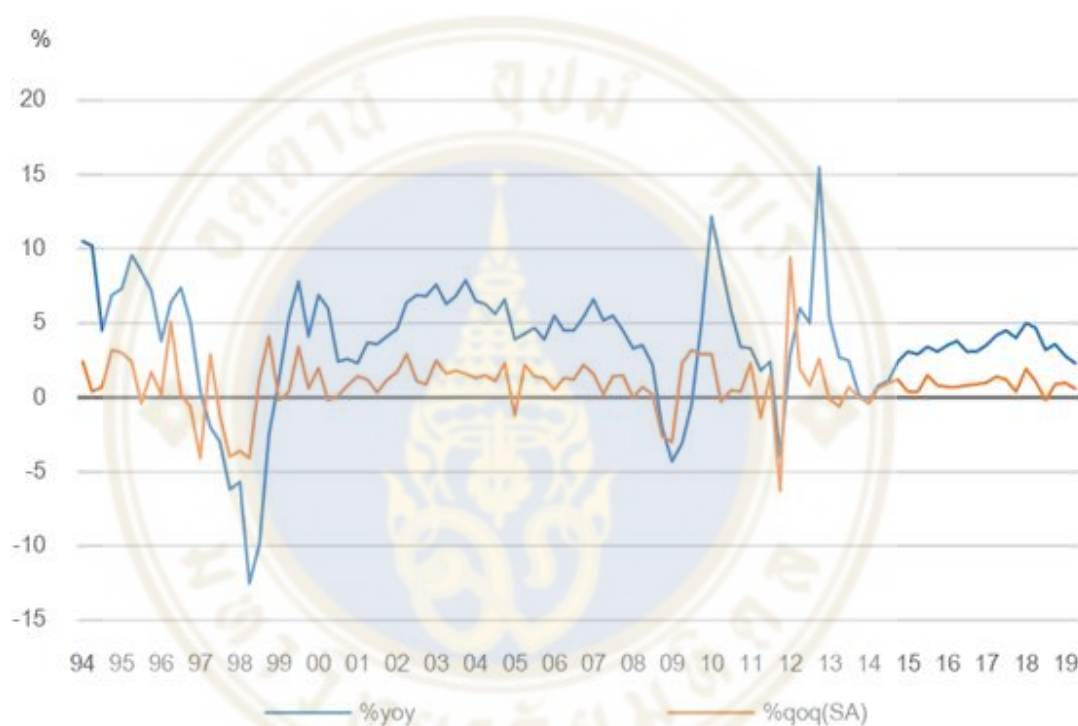
GDP growth had been the all times factor that will affect how country and world spend their capital and money. For Thailand, with data from Bank of Thailand's report had shown that many factors that contribute into current GDP are such as

- Value of merchandise export is expected to remain unchanged from 2018
- Export of service is expected to grow at slower rate from 2018

- Private consumption is expected to grow higher rate from 2018
- Private investment is expected to keep growing at constant rate
- Public spending is expected to grow at slower rate from 2018

Source: BOT Monetary Policy Report (full version), June 2019

### Real GDP Growth of Thailand



**Figure1.8 Real GDP Growth of Thailand**

Source: Office of the National Economic and Social Development Board (2019)

#### 1.3.1.3 Inflation; world, Thailand

For Thailand's Inflation rate in 2019, for Headline inflation stayed on average at 1.19%, while inflation target is aimed at  $2.5\% \pm 1.5\%$ , couple reasons that affected inflation in 2019 are such as increase in fresh food price, abnormally hot weather, higher energy price, and higher retail oil price. Other factors that give positive sign to market are such as increasing in e-commerce transaction, intensive price of product competition, and lower production price. For inflation forecast, the expectation for short

term (within 1 year) is around 1.3% to 1.9%, while expectation for long term (5 years ahead) is around 1.6% - 1.8%

Source: BOT Monetary Policy Report (full version), June 2019

### Inflation (Consumer Price Index) of Thailand



**Figure 1.9 Inflation (Consumer Price Index) of Thailand**

Source: Bureau of Trade and Economic Indices, Ministry of Commerce (2019)

#### 1.3.1.4 Other world economic factors

Dubai's crude oil price change was geopolitical issue which limited supply of crude oil, it is expected to be lower in quantity due to lower demand. With also lower demand from market forecast from the tension of trade war between China and U.S, price of crude oil is lower as it come to later in Q3/2019, as low as \$58.92 per barrel.

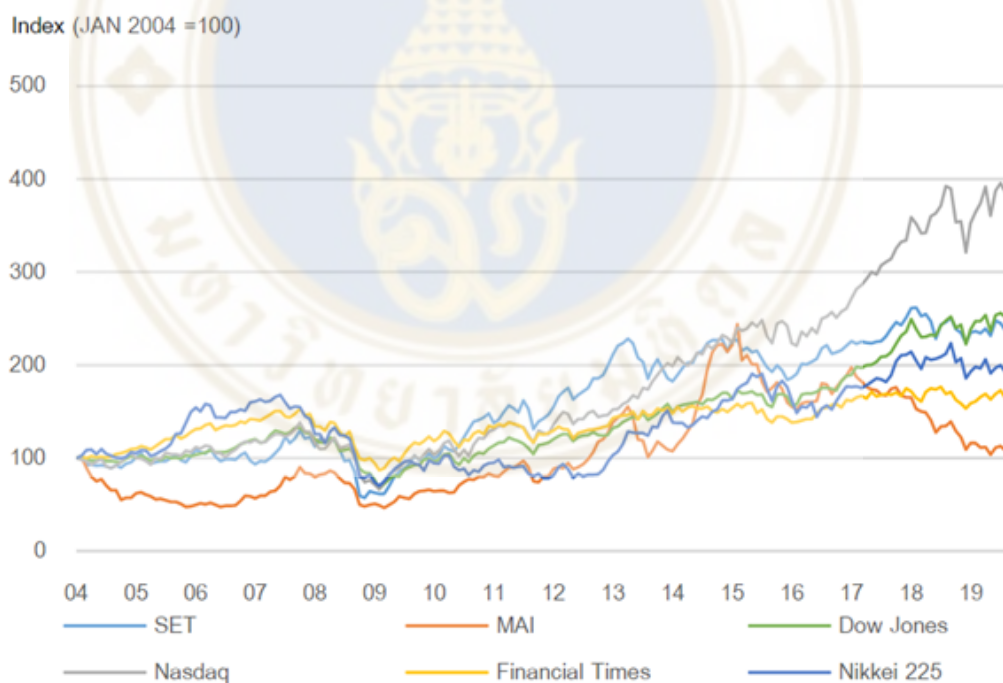
- Whole 2019 Dubai's crude oil price is between \$58.92 to \$70.66 per barrel. (up to Sep 2019)
- Whole 2018 Dubai's crude oil price is between \$56.47 to \$77.02 per barrel.
- Whole 2017 Dubai's crude oil price is between \$50.43 to \$61.41 per barrel.
- Whole 2016 Dubai's crude oil price is between \$27.00 to \$51.78 per barrel.
- Whole 2015 Dubai's crude oil price is between \$34.77 to \$63.69 per barrel.

Price fluctuation is due to many reasons such as (1) supply of worldwide is decreasing from OPEC supplier and (2) Drone attacks spark fires at Saudi Arabia's largest oil facilities in mid Sep 2019. Although, it is expected that the crisis Drone attacks will be solve quickly, price of crude oil should be on downtrend side in future. In the end, forecast the price of crude oil in 2020 from \$65 per barrel was changed to \$63 per barrel instead.

Source: World Bank Commodity Price Data (n.d.)

### Stock Market Indexes of SET vs others

Overall in Stock market indexes comparing between SET Index and other 5 indexes, in general, SET Index about some correlated patterns to other indexes, whether in bull market or bear market. For the ranking, SET Index came on 3<sup>rd</sup> ranking out of total 6 indexes, right behind Nasdaq Index and Dow Jones Index, which is quite outstanding.



**Figure1.10 Stock Market Indexes of SET vs others**

Source: Stock Exchange of Thailand and Reuters, calculated by Bank of Thailand

### 1.3.2 Industry Analysis

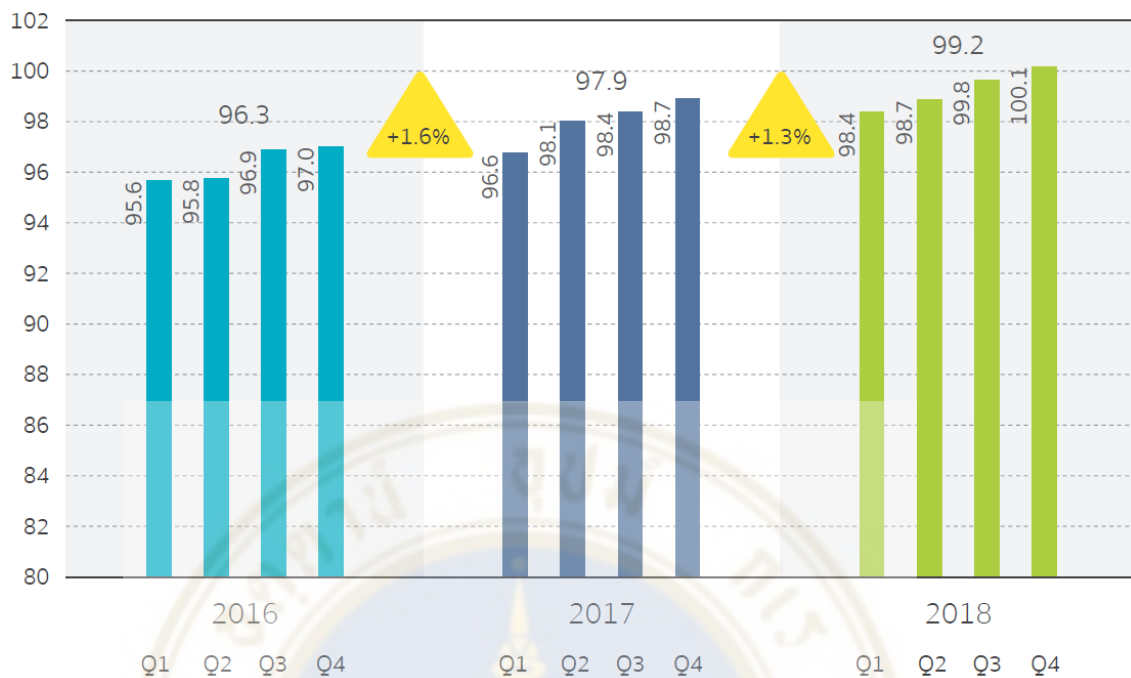
#### 1.3.2.1 Supply & demand of world petroleum & Thailand petroleum

In general, Petroleum Refinery is huge industrial business, which demand huge initial capital investment at first, also needed much of economies of scale and specific high technology on Petroleum Refining Process, thus is make one of the hardest for new entry. There are 2 type of Petroleum Refinery; (1) Simple Petroleum Refinery and (2) Complex Petroleum Refinery, which demand higher capital investment with better quality of distillation, and yield better index, which is called Nelson Complexity Index (NCI). If analyst measure the cost structure of Petroleum Refinery, cost of crude oil (as variable cost) is approximately 75-80%, and only other costs such as utilities 9%, purchase of goods & service 5%, labor 4%, and other 5%. Although, return on investment is extremely long term, about 30-50 years.

World's major international energy future markets are (NYMEX) - New York Mercantile Exchange, (IPE) - London's International Petroleum Exchange and (SIMEX) - Singapore Monetary Exchange. In Thailand, Thai petroleum company use price used from (SIMEX) - Singapore Monetary Exchange, as it is the great strategic geographical location and suitable as central port of Asia. With this reasoning, Thai retail oil price is based on SIMEX and it helps reflects real market supply & demand of oil in Asia region and it is closest for transportation cost than use from NYMEX or IPE.

Source: PTT Annual Report 2018 & IEA, December 2018

### **World Oil Demand 2016 - 2018**



**Figure 1.11 World Oil Demand 2016 – 2018**

Source: McKinsey ‘Global Oil Supply and Demand Outlook 2019’

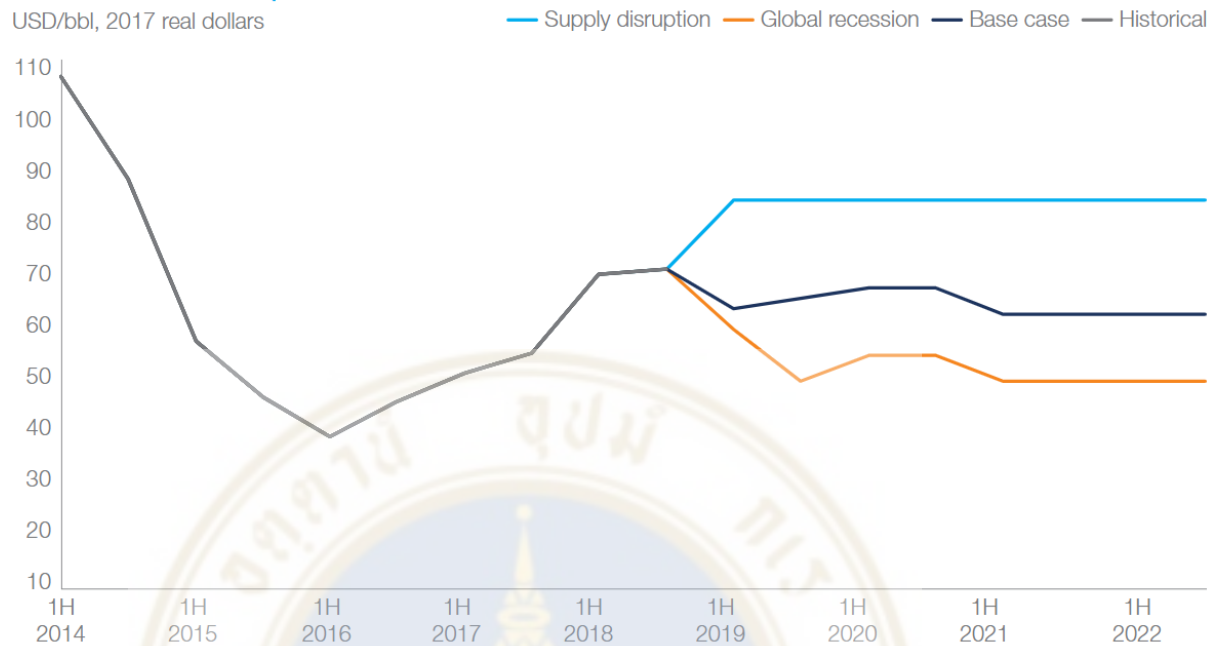
In historical data, despite of the whole world is trying to promote clean energy and such, there will be still demand in petroleum products, in 2016 demand growth was 96 million barrels per day, then for 2018, demand growth is up to 99.2 million barrels per day, with average of 1.3% - 1.6% growth in demand annually. There are many reasons demand are still in high due to factors such as; tightness between OPEC & non-OPEC production, Venezuela’s crude oil exports, tensions between Middle East countries, resumption of US sanctions on Iran, and crude oil that are export by US but restrict to transportation issue.



## World Oil Demand 2020 – 2022

### Potential mid-term Brent price scenarios

USD/bbl, 2017 real dollars



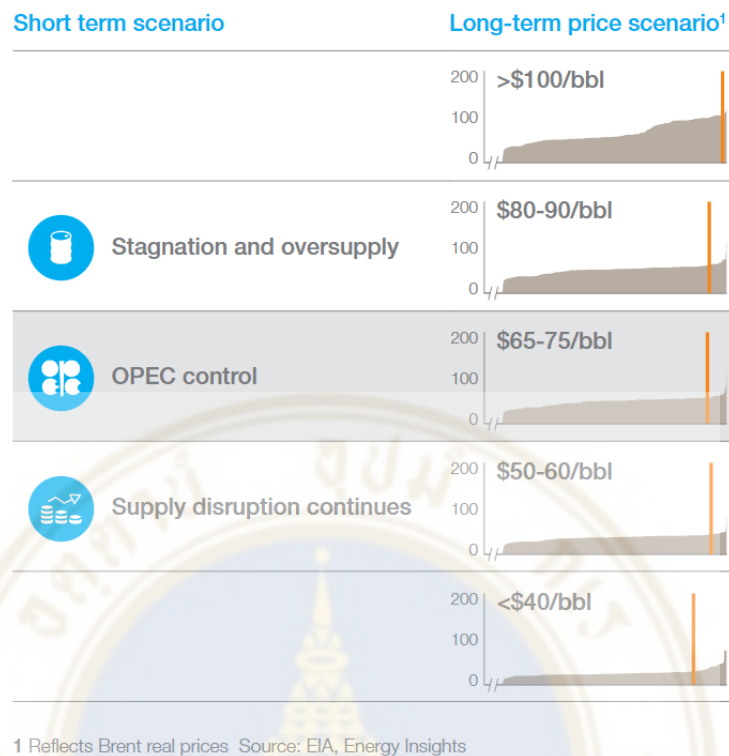
Source: Energy Insights, EIA

### **Figure 1.12 World Oil Demand 2020 – 2022**

Source: McKinsey ‘Global Oil Supply and Demand Outlook 2019’

In short term outlook perspective, accordingly Energy Insights ‘Global Oil Supply and Demand Outlook 2019’ by McKinsey, they predicted 3 situations outcome; (1) ‘Supply disruption continues’, (2) ‘OPEC control’, & (3) ‘Stagnation & Oversupply’. First, (1) ‘Supply disruption continues’ came as price can be up to \$ 80-90 per barrel, with the volatile price will lead to uncertainty to investment decisions, while MARPOL will create >1 MMb/d of additional demand. Second, (2) ‘OPEC control’ is healthy situation that MARPOL would be supporting, even with Shale Oil would also be in the market where price should be in range between \$ 60-70 per barrel. Third, (3) ‘Stagnation & Oversupply’ is situation where petroleum product is way oversupply and US shale Oil will be easily produced to low break-evens as well, price may end up around in range between \$ 50-55 per barrel.

## World Oil Demand 2022 to 2035



**Figure 1.13 World Oil Demand 2022 – 2035**

Source: McKinsey ‘Global Oil Supply and Demand Outlook 2019’

What will become the future is hardly predictable, although Energy Insights ‘Global Oil Supply and Demand Outlook 2019’ by McKinsey, predicted that in contrast to short term perspective, if price is low in short term run, it will be high in long term run. On the other hand, if price is high in short term run, it will be low in long term run. This is due to if short term price is low, meaning the investment capital will be underinvestment and future would yield lower production of petroleum products, and vice versa. There are also new scenario that are such as (4) price is >\$ 100 per barrel which is due to lack of any investment at all, but still great demand in the future, and lastly, (5) price is <\$ 400 per barrel, this may happens if petroleum products are totally unwanted in any situation where as they can find new type of renewable energy and technology disruption that will no longer need in petroleum products.

Source: McKinsey ‘Global Oil Supply and Demand Outlook 2019’

## What we conclude for Crude Oil price?

According to Deloitte: Price forecast Oil, Gas & Chemicals, September 30, 2019, use The US Energy Information Administration (EIA) and the International Energy Agency (IEA) to stated that Global crude oil since first half of 2019 had declined, on average it was between \$ 56.40 to 61.85 per barrel. They estimated that in future, with forecast Brent that will receive premium to WTI price on world market,

## International price forecast

Crude oil price and market demand forecast

Year	Av. WTI Spot	Brent Spot (38.3 API with 0.37% sulphur content)	Gulf Coast ASC	Avg. OPEC Basket	Nigerian Bonny Light (33.4 API FOB)	Mexico Maya (21.8 API FOB)	Russia Urals (31.7 API FOB)
	US\$/bbl Real	US\$/bbl Real	US\$/bbl Real	US\$/bbl Real	US\$/bbl Real	US\$/bbl Real	US\$/bbl Real
<b>Forecast</b>							
2019	\$57.00	\$62.00	\$59.00	\$60.75	\$63.00	\$56.00	\$61.75
2020	\$59.00	\$63.00	\$61.00	\$61.75	\$64.00	\$56.00	\$62.75
2021	\$62.00	\$65.00	\$64.00	\$63.75	\$66.00	\$56.00	\$64.75
2022	\$65.00	\$67.00	\$67.00	\$65.75	\$68.00	\$58.00	\$66.75
2023	\$65.00	\$67.00	\$67.00	\$65.75	\$68.00	\$58.00	\$66.75
2024	\$65.00	\$67.00	\$67.00	\$65.75	\$68.00	\$58.00	\$66.75
2025	\$65.00	\$67.00	\$67.00	\$65.75	\$68.00	\$58.00	\$66.75
2026	\$65.00	\$67.00	\$67.00	\$65.75	\$68.00	\$58.00	\$66.75

**Figure 1.14 International price forecast**

Source: The US Energy Information Administration (EIA) and the International Energy Agency (IEA)

**Table 1.9 Price forecast vs Price \$ per barrel**

Year	Price \$ per barrel
2020	61.75
2021	63.75
2022	65.75
2023	65.75
2024	65.75
2025	65.75

To estimate the crude oil price, Deloitte considers the current monthly trends, the actual price and trends for the year-to-date and the prior year actual prices. The base forecast for both oil and gas are based on New York Mercantile Exchange (NYMEX) futures in US dollars.

## **Petroleum Refineries Industry 2018 – Thailand’s perspective**

### **INDUSTRY ESTABLISHMENTS, SALES & EMPLOYMENT TRENDS**

	Year					Percent Change Year-to-Year			
	2016	2017	2018	2019	2020	16-17	17-18	18-19	19-20
<b>Establishments</b>	75	77	80	86	88	3.4%	3.1%	7.1%	3.0%
<b>Sales (\$Millions)</b>	24,711	29,757	35,210	41,831	52,428	20.4%	18.3%	18.8%	25.3%
<b>Employment</b>	15,757	16,295	16,795	17,986	18,518	3.4%	3.1%	7.1%	3.0%
<b>Sales (BahtM)</b>	795,683	958,160	1,133,754	1,346,948	1,688,194	20.4%	18.3%	18.8%	25.3%

### **INDUSTRY RATIOS**

(Industry Averages)	Year					Percent Change Year-to-Year			
	2016	2017	2018	2019	2020	16-17	17-18	18-19	19-20
<b>Sales (\$M)/Estab.</b>	329.77	383.99	440.83	489.05	595.34	16.4%	14.8%	10.9%	21.7%
<b>Sales (\$) per Emp.</b>	1,568,265	1,826,118	2,096,411	2,325,706	2,831,187	16.4%	14.8%	10.9%	21.7%
<b>Emps. per Estab.</b>	210.3	210.3	210.3	210.3	210.3	0.0%	0.0%	0.0%	0.0%
<b>Bahts(M)/Estab.</b>	10,618.67	12,364.58	14,194.73	15,747.28	19,169.88	16.4%	14.8%	10.9%	21.7%
<b>Bahts per Emp.</b>	50,498,131	58,800,993	67,504,429	74,887,739	91,164,223	16.4%	14.8%	10.9%	21.7%

**Figure 1.15 Petroleum Refineries Industry 2018 – Thailand’s perspective**

Source: Petroleum Refineries Industry 2018 Barnes Reports: Worldwide Industry Market report

Future forecast for price of crude oil is quite debatable and need to observe actual result. With current output, there are more supply than demand of crude oil about 500,000 barrels per day, meaning the usage of petroleum is declining. There are many factors such trade war between China and U.S., Economy problem with “no-deal Brexit”, the incoming of supplier from U.S. that predicted they can supply about 13 million barrels per day more, or about 7.5 % growth rate YOY. With the Drone attacks spark fires at Saudi Arabia’s largest oil facilities, it should be solved quickly as soon as November 2019, as the Saudi Aramco Co. announced that they can recovery quickly from this event. Saudi Aramco Co. have as high as crude oil 190 million barrels in reserve. Also, Saudi Aramco Co. expected to host IPO event for their company by March 2020 and tend to carry the price of crude oil up to \$70 per barrel.

Source: pttplc - Why is Thai retail oil price based on Singapore price

## 1.3.2.2 Benzol, Diesel, and Gasoline usage &amp; price

**Table 1.10 Benzol, Diesel, and Gasoline usage & price in Thailand (2016 – 2018, including 1st half of 2019)**

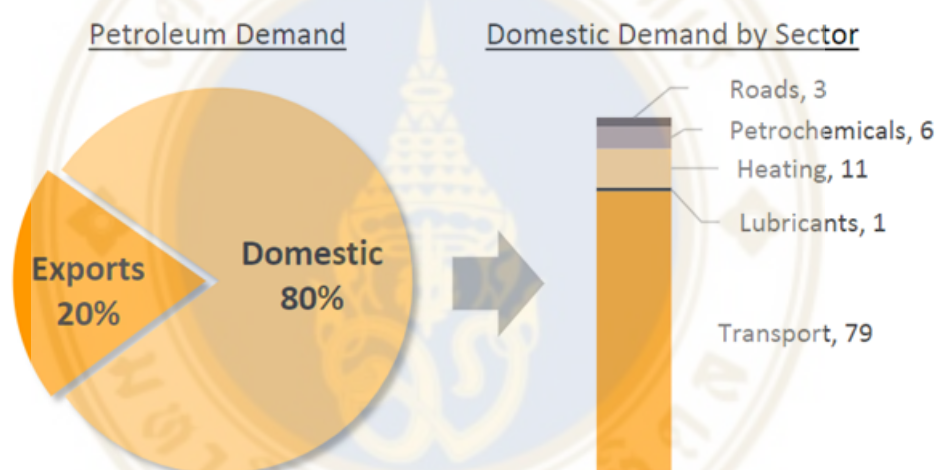
	Million Liters per day				2019 (Jan-Jun)	
	2016	2017	2018	2019 (Jan-Jun)	growth (%) YoY	Share Overall (%)
Diesel	61.94	63.77	64.71	68.99	3.2%	52%
Benzol	28.98	30.06	31.05	32.10	3.9%	24%
Benzol 95	1.34	1.23	1.09	1.00	12.5%	1%
Gasoline					4.5%	
Gasoline 91(E10)	11.13	10.64	9.97	9.64	-5.7%	7%
Gasoline 95(E10)	10.84	11.92	12.98	13.74	7.5%	10%
Gasoline 95(E20)	4.79	5.21	5.81	6.43	14.2%	5%
Gasoline 95(E85)	0.89	1.05	1.20	1.30	13.9%	1%
<b>Total</b>	<b>119.91</b>	<b>123.88</b>	<b>126.81</b>	<b>133.20</b>		<b>100%</b>
<b>growth %</b>		<b>3.3%</b>	<b>2.4%</b>	<b>5.0%</b>		
	Retail price: Baht per Liter					
	2016	2017	2018	2019 (Jan-Jun)		
Diesel	23.26	25.64	28.35	26.46		
Benzol	24.09	26.66	28.31	27.28		
Benzol 95	31.08	34.54	36.32	35.69		
Gasoline	23.71	26.33	28.02	27.01		
Gasoline 91(E10)	24.13	26.88	28.69	27.77		
Gasoline 95(E10)	24.5	27.15	28.96	28.04		
Gasoline 95(E20)	21.98	24.64	26.22	25.03		
Gasoline 95(E85)	18.14	19.97	20.88	20.21		

This is historical data shown how much Thailand spent on usage of Petroleum as consumable product on daily basis, from year 2016 to first half of year 2019. With also retail price that it was sell in each. As the table listed, in year 2019, Diesel is biggest consumption, at 52%, follow along with Benzol at 24%, and then other gasoline types. In each year, there will be increase demand in overall consumption between 2.4% - 5.0%, as the uptrend, contrast to what reports usually stated that demand in petroleum products supposed to be in downtrend.

Source: [epo.go.th](http://epo.go.th) - Petroleum & Electricity usage in Thailand Report (Aug 2019)

### 1.3.2.3 Import & Export ratio of Petroleum

- **Thailand Petroleum Market 2018**



**Figure 1.16 Thailand Petroleum Market 2018**

Source: EPPO 2018

Mainly, from all petroleum demand, they were used within domestic about 80% and export for 20%. In Thai market, retail price is not determined by refining volume, marketing margin, or cost of crude. But it is determined by Thai government as through collection of tax and contribution from distributors from Oil Fund. In 80% of within domestic consumption, about 79% is used for transportation fuel, 11% for electricity generation & industrial powers, 6% is used in petrochemical industry, and 3% is used for construction. The another 20% for export, mainly goes go ASEAN zone.

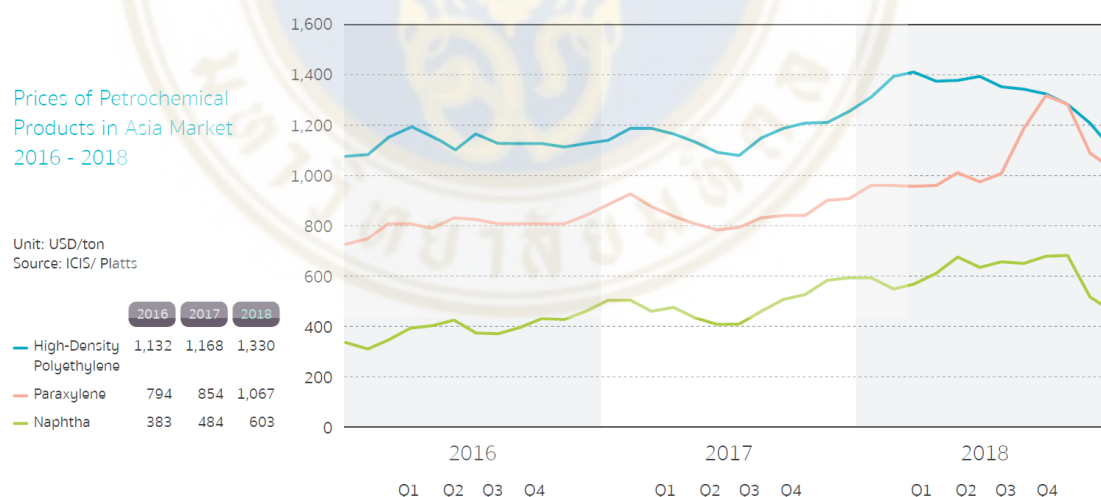
Source: krungsri research – Refinery Industry in Thailand Report (Mar 2019)

### 1.3.2.4 Supply & demand of world petrochemical & Thailand petrochemical

Petrochemical Market is constantly growing at rate around 1%-2% and higher rate for downstream products. The demand of Thailand's Petrochemical product grows about 3% - 4.5% because the higher export amount to countries that have high manufacturing output sectors. It has 4 sectors where (0) they start with petroleum products, (1) Feedstock, (2) Upstream Petrochemical, (3) Intermediates, (4) Downstream Petrochemical, then lastly as usable product as (5) consumer products.

*“High Density Polyethylene (HDPE) price is about \$1,330 per ton in 2018. Paraxylene (PX), reasoned for price by 2018 are because high demand for polyester, as well as new PX plants in Vietnam and Saudi Arabia aren't able to run at full capacities. By then, it means PX price in 2018 is about \$1,067 per ton*

*In addition, Naphtha price in 2018 – with the combination from prices of petrochemical products kept at high levels in the first 3 quarters, along with crude oil as well as Naphtha prices, meaning it will ticked stronger demand for plastic products, not only that, final reason is China's ban on imports of plastic waste.” - PTT Annual Report 2018*



**Figure 1.17 Price of Petrochemical products in Asia Market 2016 – 2018**

Source: ICIS/Platts 2018

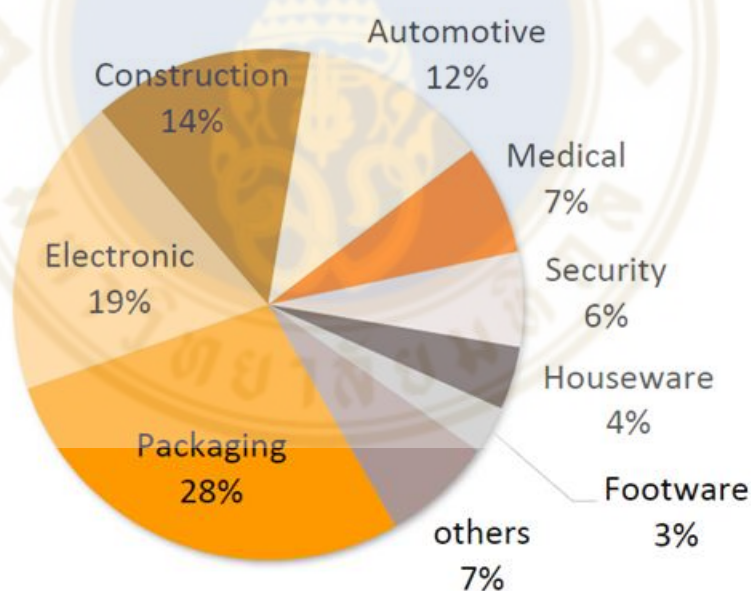
From price of petrochemical product that are use in Asia market, there are 3 main products listed as:

- High-Density Polyethylene (HDPE) is type of plastic that strong, high density, moderately stiff. It is used for product such as plastic bottles, corrosion-resistant piping, geomembranes and plastic lumber.
- Paraxylene is raw materials for petrochemical industry, it used as a basic raw material in the manufacture of terephthalic acid (TPA), purified terephthalic acid (PTA) and dimethyl-terephthalate (DMT), then do the production for PET bottles.
- Naphtha is intermediate hydrocarbon liquid stream derived from the refining of crude oil

All 3 products are generally used as ranking (1) High-Density Polyethylene price were between \$1,132 – 1,330 per ton, (2) Paraxylene price were between \$794 – 1,067 per ton, & (3) Naphtha price were between \$383 – 603 per ton

Source: PTT Annual Report 2018 & ICIS/ Platts

#### **Global Demand for Petrochemicals in 2018**



**Figure1.18 Global Demand for Petrochemicals in 2018**

Source: Nexant 2018



For people who are not into petroleum industry and petrochemical industry may not know about what mainly daily items, consumables, or infrastructures would come from petroleum products and petrochemical products. According to Krungsri Research, they divided into 9 categories; petrochemical products can yield (1) Packaging items, (2) Electronic items, (3) Construction materials, (4) Automotive parts, (5) Medical consumables, (6) Security products, (7) Houseware products, (8) Foot ware products, & (9) many other products & items.

Source: Krungsri Research – Petrochemical Industry in Thailand Report (Jun 2019)

**Table 1.11 Highest Revenue Company (Top 5) in Petrochemical industry in Thailand**

	Revenue					Net Profit				
	Q1/ 2018	Q1/ 2018%	Q1/ 2019	Q1/ 2019 %	% YoY	Q1/ 2018	Q1/ 2018%	Q1/ 2019	Q1/ 2019 %	% YoY
PTTGC	122,250	44%	114,197	41%	-6.6%	11,955	9.8%	5,893	5.2%	<b>-50.7%</b>
Indorama Ventures (IVL)	77,333	28%	97,280	35%	25.8%	2,054	2.7%	619	0.6%	<b>-69.9%</b>
SCG Chemicals	54,057	20%	47,042	17%	13.0%	10,662	19.7%	6,866	14.6%	<b>-35.6%</b>
IRPC	17,558	6%	15,629	6%	-11.0%	2,230	12.7%	583	3.7%	<b>-73.9%</b>
Vinythai	5,518	2%	4,618	2%	-16.3%	962	17.4%	536	11.6%	<b>-44.3%</b>
<b>Total</b>	<b>276,715</b>	<b>100%</b>	<b>278,766</b>	<b>100%</b>	<b>0.7%</b>	<b>27,863</b>	<b>12.5%</b>	<b>14,497</b>	<b>7.1%</b>	<b>-48.0%</b>
						[Avg.]			[Avg.]	

In term of Petrochemical Industry, IRPC wasn't the best among its peer, in fact, according to what we can observe from Q1/2018 to Q1/2019, even all of Petrochemical competitors (including IRPC), has significant growth rate in term of revenue, except IRPC and Vinythai. To addition on that, IRPC has worst in term of net profit growth among competitors as well, which is -73.9% while peers were in range between -48% to -69.9%. Although, look alone as IRPC, it is ranked at 4<sup>th</sup> as highest revenue company in Petrochemical Industry in Thailand, as Q1/2018, it has really high net profit during that time, but cannot sustain the net profit into Q1/2019, shows a worrying doubt.

Source: gsb.or.th Petrochemical Report (May 2019)

### 1.3.3 Competition Analysis

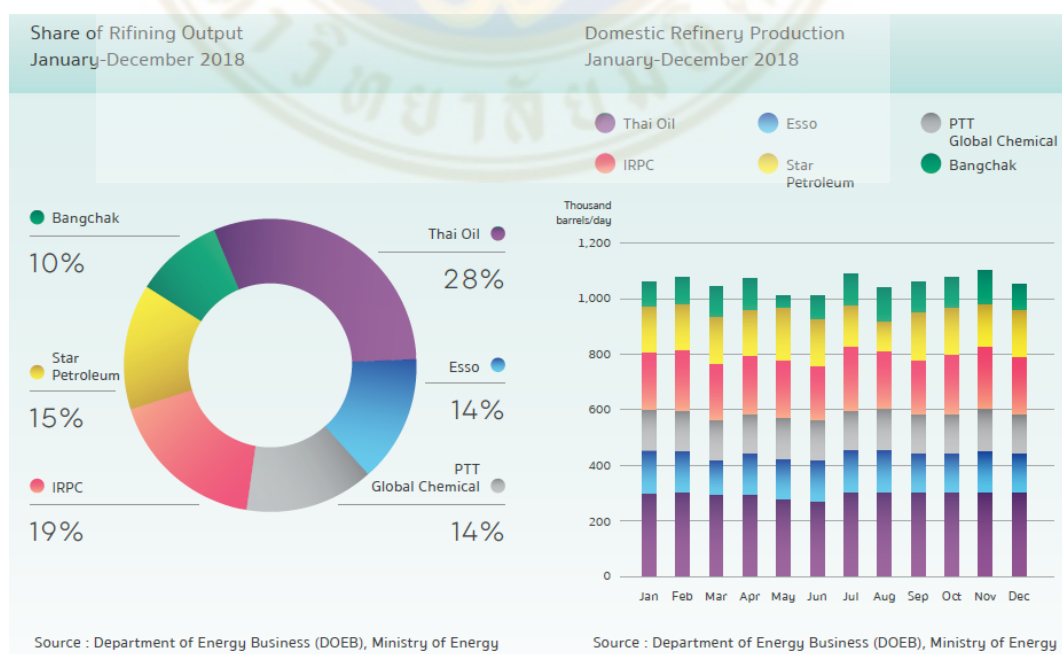
#### 1.3.3.1 IRPC vs TOP (also ESSO, SPRC, BCP)

We have selected 1 main competitor as “Thai Oil Public” or TOP for short, and other 3 comparable competitors, which are Star Petroleum (SPR), Bangchak (BCP), and ESSO (ESSO). In combination, we’ll have total of 4 competitors. Noted, that before we analyze anything, it should be mentioned that PTT Public Company Limited are majority shareholder in many companies in Petroleum industry & Petrochemical industry. Currently, PTT Public Company Limited held about 48% of all shares from this 3 companies in this field; which are Thai Oil Public, PTT Global Chemical (not included as competitor in this paper), and IRPC. While other company such as Star Petroleum has biggest shareholder from Chevron at 60%, Bangchak has biggest shareholder from Vayupak Fund at 14% & Social Security Office at 14%, and ESSO has biggest shareholder from ExxonMobil at 66%

Meaning that while we compared IRPC to main competitor, TOP, their Mother Company basically are same Mother Company, which leads to identical areas such as operation, management, shareholders, and many more.

- Market share of refining companies in Thailand

#### 1.3.3.2 Market share of refining companies in Thailand



**Figure 1.19 Market share of refining companies in Thailand**

Among all competitor, IRPC can produced output at 19%, became the #2 highest refinery output in Thailand, while #1 is Thai Oil which can produced output at 28%. The #3 ranked was Star Petroleum , the #4 & #5 ranked came close by equally, which were ESSO and PTT Global Chemical (not included as competitor in this paper), and lastly, the #6 ranked was Bangchak.

Source: Thai Oil Public Annual Report 2018

**Table 1.13 Share of refining output & production in Thailand**

Crude run (in Thousand barrels per day, KBD)						
		2017	%	2018	%	g %
1	<b>Thai Oil</b>	306	33.8%	304	32.6%	-0.66%
2	<b>IRPC</b>	181	20.0%	207	22.2%	12.56%
3	<b>Star Petroleum</b>	166	18.4%	176	18.9%	5.68%
4	<b>ESSO</b>	140	15.5%	144	15.4%	2.78%
5	<b>Bangchak</b>	111	12.3%	102	10.9%	-8.82%
	<b>Total</b>	<b>904</b>	<b>100%</b>	<b>933</b>	<b>100%</b>	<b>3.11%</b>

Noted that total number of outputs in this table is excluding data from PTT Global Chemical, if combine PTT Global Chemical, total for 2017 would be 1,095 KBD (Kilo Barrel per day), and total for 2018 would be 1,035, since PTT Global Chemical isn't included in our analysis.

Source: Department of Energy Business Jan.-Nov. 2018 and Bangchak Corporation Plc.

## 1.4 Investment Summary

### DCF model; investment summary

We issue a SELL recommendation on IRPC Public Company Limited with a one-year target price of THB 1.52 determined by the Discounted Free Cash Flow to Firm Method with WACC at 10.83% and terminal growth rate 1.54%. The intrinsic value is lower than the current market price THB 3.62 as at 13 December 2019.

Valuation Summary	Amount (Million)
Value of Operating Assets	83,638.96
Value of Non-Operating Assets	3,071.00
Value of Firm	86,709.96
Value of Debt	55,574.00
Value of Equity	31,135.96
Number of share outstanding	20,434.42
Intrinsic value per share	1.52 Baht
Market share price	3.52 Baht

**Figure 1.20 DCF model Summary**

Source: Own calculation

### Relative Valuation model; investment summary

We issue a SELL recommendation on IRPC Public Company Limited as table suggested:

**Table 1.14 Relative Valuation Comparable Company Analysis**

	Band Value	Band Rank	IRPC 5 yrs Median	Selected Peer 5 yrs Median	Selected Peer Median Rank	Oil & Gas T12M Median	Oil & Gas T12M Median Rank	Forecast Price	Summary
1. Share Price	UV	Below SD1	-	-	-	-	-	-	UV = 6 Indicators  OV = 10 indicators
2. Enterprise Value	OV	Above SD	-	-	-	-	-	-	
3. trailing P/E	OV	Above SD2	12.7	10.4	OV	7.9	OV	-	
4. forward P/E	UV	Below SD	-	-	-	-	-	OV	
5. trailing P/BV	UV	Below SD1	1.19	1.29	UV	0.9	OV	-	
6. forward P/BV	OV	Above SD	-	-	-	-	-	UV	
7. trailing EV/EBITDA	OV	Above SD	9.2	6.9	OV	5.9	OV	-	
8. forward EV/EBITDA	UV	Below SD	-	-	-	-	-	-	

UV = Undervalued

OV = Overvalued

All in all, 6 Undervalued indicators vs 10 Overvalued indicators; with relative valuation method, we would recommend SELL on IRPC Public Company Limited

## 1.5 Financial Analysis

The analysis of historical income statements consisted of size analysis, common size analysis, trend analysis, and financial ratios. We provide the analysis by comparing information to IRPC's key competitor: TOP

### 1.5.1 Income Statement

**Table 1.15 IRPC Income Statement**

<b>Unit: Million Baht</b>	<b>2018</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>	<b>2014</b>
Revenue	280,551	214,101	185,041	214,172	281,589
COGS	264,637	192,946	164,900	197,913	287,930
<b>Gross Profit</b>	<b>15,914</b>	<b>21,155</b>	<b>20,140</b>	<b>16,258</b>	<b>(6,341)</b>
Selling/General/Admin. Expenses	6,788	6,686	5,875	3,050	5,154
Depreciation/Amortization	185	211	197	298	287
Interest/Investment Income - Operating	(530)	305	2,964	224	(3,061)
Unusual Expense (Income)	(296)	(831)	(3)	(18)	3,293
Other Operating Expenses	(431)	(437)	(358)	(1,730)	(6,035)
Total Expenses	270,354	198,881	173,576	199,738	287,568
<b>EBIT</b>	<b>10,197</b>	<b>15,220</b>	<b>11,465</b>	<b>14,434</b>	<b>(5,979)</b>
Financial costs	(1,282)	(1,680)	(1,431)	(2,665)	(1,632)
<b>Profit/Loss before Income tax expense (EBT)</b>	<b>8,915</b>	<b>13,541</b>	<b>10,034</b>	<b>11,769</b>	<b>(7,611)</b>

**Table 1.15 IRPC Income Statement (cont.)**

Provision for Income Taxes	1,147	2,181	282	2,346	(2,398)
Net Income After Taxes	7,769	11,359	9,752	9,423	(5,213)
Minority Interest	(34)	(5)	(31)	(21)	(21)
<b>Net Income</b>	<b>7,735</b>	<b>11,354</b>	<b>9,721</b>	<b>9,402</b>	<b>(5,235)</b>
EBITDA	10,382	15,431	11,662	14,732	(5,692)

Source: IRPC Financial Statement 2018

**Table 1.16 TOP Income Statement**

<b>Unit: Million Baht</b>	<b>2018</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>	<b>2014</b>
Revenue	389,344	337,388	274,739	293,569	390,090
Cost of Revenue	373,128	305,386	247,261	273,819	394,150
<b>Gross Profit</b>	<b>16,216</b>	<b>32,002</b>	<b>27,478</b>	<b>19,750</b>	<b>(4,060)</b>
Selling/General/Admin. Expenses	2,717	3,396	2,558	3,136	2,550
Depreciation/Amortization	65	65	75	71	91
Interest Exp.(Inc.),Net- Operating	(2,537)	(5,318)	(2,233)	(408)	(5,040)
Unusual Expense (Income)	--	--	--	0	(386)
Other Operating Expenses	(338)	(275)	(266)	(586)	(617)
Total Expenses	373,034	303,254	247,396	276,033	390,748
<b>EBIT</b>	<b>16,309</b>	<b>34,134</b>	<b>27,343</b>	<b>17,537</b>	<b>(658)</b>

**Table 1.16 TOP Income Statement (cont.)**

Financial costs	(3,942)	(3,285)	(3,461)	(3,435)	(3,966)
<b>Profit/Loss before Income tax expense (EBT)</b>	12,367	30,849	23,882	14,102	(4,624)
Provision for Income Taxes	1,983	5,529	2,295	1,597	(920)
Net Income After Taxes	10,384	25,319	21,587	12,504	(3,704)
Minority Interest	(235)	(463)	(365)	(323)	(322)
<b>Net Income</b>	<b>10,149</b>	<b>24,856</b>	<b>21,222</b>	<b>12,181</b>	<b>(4,026)</b>
EBITDA6	10,214	24,921	21,297	12,252	(3,935)

Source: TOP Financial Statement 2018

By comparing income statement of IRPC and TOP, Revenues of TOP is larger than IRPC. The 2018 revenue of TOP was 389,344 million baht while IRPS's was only 280,551 million baht. This is mainly from market share of refinery output in Thailand. TOP is no.1 market share holding 28% while IRPC is no.2 in the market which holding 19% market share.

Even the revenue of 2 companies had big gap of approximately 100,000 million baht, the gross profit was quite close which were 15,914 million baht from IRPC and 16,216 million baht from TOP. This is because TOP production cost was constantly huge while IRPC had better of production cost management.

Comparing operating expense between IRPC and TOP, we can see that TOP had much better cost management on SG&A which was only half of IRPC and the SG&A costs of TOP was quite fluctuating which there were ups and downs while SG&A costs of TOP was only going up. The bottom line of net income, both IRPC and TOP has the same trend which were ups and downs over years and to look closer on both companies' financial performance on EBITDA, we can see that the number of EBIT of year 2018 of IRPC was higher than TOP, 10,382 million baht and 10,214 million baht respectively.



### 1.5.2 Statement of Financial Position of IRPC

**Table 1.17 Statement of Financial Position of IRPC**

<b>IRPC Unit: Million Baht</b>	<b>2018</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>	<b>2014</b>
<b>Current assets</b>					
Cash and Short- Term Investments	2,338	2,145	2,042	3,576	2,009
Accounts Receivable - Trade	12,197	12,784	9,967	8,942	11,192
Total Receivables	14,914	14,356	10,976	9,986	15,436
Total Inventory	28,459	30,052	25,783	21,306	25,344
Prepaid Expenses	241	238	163	118	144
Other Current Assets, Total	678	792	884	998	1,209
<b>Total Current Assets</b>	<b>46,629</b>	<b>47,583</b>	<b>39,848</b>	<b>35,984</b>	<b>44,142</b>
<b>Non-current assets</b>					
Property/Plant/Equipment, Total - Gross	205,803	201,524	190,228	178,903	160,461
Property/Plant/Equipment, Total - Net	124,737	127,061	120,171	114,807	100,872
Accumulated Depreciation, Total	(81,066)	(74,463)	(70,057)	(64,096)	(59,589)
Intangibles, Net	546	683	809	1,122	1,331
Intangibles - Gross	3,979	3,889	3,759	3,810	3,764
Accumulated Intangible Amortization	(3,432)	(3,206)	(2,950)	(2,688)	(2,433)
Long Term Investments	9,669	8,898	8,984	8,458	8,124

**Table 1.17 Statement of Financial Position of IRPC (cont.)**

Note Receivable - Long Term	--	--	--	0	3,310
Other Long Term Assets	865	320	2,566	2,803	5,020
Total Non-Current Assets	135,817	136,961	132,530	127,190	118,656
<b>Total Assets</b>	<b>182,446</b>	<b>184,544</b>	<b>172,378</b>	<b>163,174</b>	<b>162,798</b>
<b>Current Liabilities</b>					
Accounts Payable	26,212	26,031	19,792	25,741	25,815
Accrued Expenses	2,316	2,191	2,254	2,194	1,332
Notes Payable/Short Term Debt	6,700	2,957	6,141	227	8,847
Current Port. of LT Debt/Capital Leases	7,104	10,660	19,705	4,265	7,701
Other Current liabilities, Total	6,564	7,513	4,537	3,784	3,134
<b>Total Current Liabilities</b>	<b>48,896</b>	<b>49,353</b>	<b>52,429</b>	<b>36,210</b>	<b>46,829</b>
<b>Non-current liabilities</b>					
Total Long-Term Debt	43,561	45,152	36,741	49,235	44,243
Total Debt	57,365	58,769	62,587	53,727	60,791
Deferred Income Tax	--	41	--	--	--
Minority Interest	94	137	85	74	70
Other Liabilities	2,609	2,348	2,204	1,850	3,822

**Table 1.17 Statement of Financial Position of IRPC (cont.)**

Total Non-Current Liabilities	46,264	47,678	39,029	51,159	48,136
<b>Total Liabilities</b>	<b>95,160</b>	<b>97,031</b>	<b>91,458</b>	<b>87,369</b>	<b>94,965</b>
<b>Shareholders Equity</b>					
Common Stock, Total	20,434	20,434	20,434	20,434	20,434
Additional Paid-In Capital	28,569	28,569	28,569	28,569	28,569
Retained Earnings (Accumulated Deficit)	38,413	38,639	31,980	26,956	19,300
Treasury Stock - Common	(124)	(124)	(124)	(124)	(124)
Other Equity, Total	(7)	(5)	61	(31)	(346)
Other Equity	--	--	61	(31)	(346)
Other Comprehensive Income	(7)	(5)	--	--	--
<b>Total Equity</b>	<b>87,286</b>	<b>87,513</b>	<b>80,920</b>	<b>75,804</b>	<b>67,834</b>
<b>Total Liabilities &amp; Shareholders' Equity</b>	<b>182,446</b>	<b>184,544</b>	<b>172,378</b>	<b>163,174</b>	<b>162,798</b>

Source: IRPC Financial statement 2018

**Table 1.18 Statement of Financial Position of TOP**

<b>TOP Unit: Million Baht</b>	<b>2018</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>	<b>2014</b>
<b>Current Assets</b>					
Cash and Short Term Investments	107,262	67,941	60,774	53,129	46,483
Accounts Receivable - Trade	24,359	22,328	19,536	14,177	16,141
Total Receivables	27,204	24,798	21,143	17,115	19,210
Total Inventory	28,739	32,841	33,189	18,883	28,533
Prepaid Expenses	1,539	631	622	1,361	1,220
Other Current Assets, Total	0	0	2	2	18
<b>Total Current Assets</b>	<b>164,743</b>	<b>126,211</b>	<b>115,731</b>	<b>90,490</b>	<b>95,464</b>
<b>Non-Current Assets</b>					
Property/Plant/Equipment, Total - Gross	188,862	182,275	178,491	172,530	163,210
Property/Plant/Equipment, Total - Net	79,929	78,612	82,312	83,258	79,120
Accumulated Depreciation, Total	(108,933)	(103,663)	(96,179)	(89,272)	(84,090)
Goodwill, Net	585	601	655	667	641
Intangibles, Net	2,460	2,590	2,451	1,239	1,311
Intangibles - Gross	4,387	4,335	3,977	2,572	2,533
Accumulated Intangible Amortization	(1,927)	(1,745)	(1,526)	(1,333)	(1,222)
Long Term Investments	16,183	18,353	14,985	14,444	14,144

**Table 1.18 Statement of Financial Position of TOP (cont.)**

Note Receivable - Long Term	538	583	605	606	651
Other Long Term Assets, Total	4,174	1,157	993	1,462	2,277
Total Non-Current Assets	103,870	101,897	102,000	101,676	98,143
<b>Total Assets</b>	<b>268,613</b>	<b>228,108</b>	<b>217,731</b>	<b>192,166</b>	<b>193,607</b>
<b>Current Liabilities</b>					
Accounts Payable	21,844	18,963	19,887	12,053	17,811
Accrued Expenses	103	327	592	133	161
Notes Payable/Short Term Debt	2,392	969	867	413	497
Current Port. of LT Debt/Capital Leases	4,549	1,592	7,138	1,374	12,338
Other Current liabilities, Total	9,132	11,497	5,661	4,219	4,827
Total Current Liabilities	38,020	33,348	34,146	18,192	35,635
<b>Non-current liabilities</b>					
Total Long Term Debt	100,120	63,907	68,296	73,719	67,265
<b>Total Debt</b>	<b>107,060</b>	<b>66,468</b>	<b>76,301</b>	<b>75,506</b>	<b>80,101</b>
Deferred Income Tax	37	9	10	--	--
Minority Interest	4,760	4,925	4,741	4,637	4,448
Other Liabilities, Total	3,964	3,696	3,683	3,246	2,863

**Table 1.18 Statement of Financial Position of TOP (cont.)**

<b>Total Non-Current Liabilities</b>	<b>108,881</b>	<b>72,537</b>	<b>76,729</b>	<b>81,602</b>	<b>74,576</b>
<b>Total Liabilities</b>	<b>146,901</b>	<b>105,885</b>	<b>110,875</b>	<b>99,794</b>	<b>110,211</b>
<b>Shareholders Equity</b>					
Common Stock, Total	20,400	20,400	20,400	20,400	20,400
Additional Paid-In Capital	2,456	2,456	2,456	2,456	2,456
Retained Earnings (Accumulated Deficit)	98,988	99,463	84,237	69,747	60,845
Unrealized Gain (Loss)	58	69	(78)	(89)	(87)
Other Equity, Total	(191)	(165)	(159)	(142)	(218)
Translation Adjustment	(190)	(159)	(38)	(17)	(91)
Other Equity	--	--	(128)	(128)	(128)
Other Comprehensive Income	(1)	(6)	7	3	0
<b>Total Equity</b>	<b>121,712</b>	<b>122,223</b>	<b>106,857</b>	<b>92,371</b>	<b>83,396</b>
<b>Total Liabilities &amp; Shareholders' Equity</b>	<b>268,613</b>	<b>228,108</b>	<b>217,731</b>	<b>192,166</b>	<b>193,607</b>

Source: TOP financial statement 2018

Comparing 2 company sizes by total assets, TOP has larger assets with 268,613 million baht as of year 2018. This was consisting of 164,743 million-baht current assets and 103,870 million-baht non-current assets. The highest value of assets was from current assets which was cash and cash equivalent of 107,262 million baht, the second to cash were net PPE of 79,929 million baht. For liabilities in year 2018, major parts were from Non-current liabilities of 108,881 million baht and current-liabilities of 38,020 million baht. The total liabilities had 2 major items; long-term debt of 100,120 million baht and account payable of 21,844 million baht. While IRPC has smaller size than TOP which the assets was 182,446 million baht as of year 2018; 48,896 million baht from

current assets and 103,870 million from non-current assets. The major items in total assets were 124,737 million baht of net PPE, 28,459 baht of inventory, and 14,914 million baht of total receivables. For the liabilities, IRPC had liabilities of 95,160 million as of year 2018. The major items were 43,561 million baht of long-term debt and 26,212 million baht of account payable. For equity, TOP has bigger total equity of 121,712 million baht while IRPC has only 87,286 baht; mainly differences items are from retain earnings.

### 1.5.3 Common size analysis

**Table 1.19 P/L Common size Income statement of IRPC and TOP**

<b>PL</b>	<b>TOP 2018</b>	<b>IRPC 2018</b>	<b>IRPC 2017</b>	<b>IRPC 2016</b>	<b>IRPC 2015</b>	<b>IRPC 2014</b>
Revenue	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Cost of Revenue, Total	95.84%	94.33%	90.12%	89.12%	92.41%	102.25%
Gross Profit	4.16%	5.67%	9.88%	10.88%	7.59%	-2.25%
Selling/General/ Admin. Expenses, Total	0.70%	2.42%	3.12%	3.17%	1.42%	1.83%
Depreciation/ Amortization	0.02%	0.07%	0.10%	0.11%	0.14%	0.10%
Interest/Investment Income - Operating	-0.65%	-0.19%	0.14%	1.60%	0.10%	-1.09%

**Table 1.19 P/L Common size Income statement of IRPC and TOP (cont.)**

Unusual Expense (Income)	<b>0.00%</b>	<b>-0.11%</b>	<b>-0.39%</b>	<b>0.00%</b>	<b>-0.01%</b>	<b>1.17%</b>
Other Operating Expenses, Total	<b>-0.09%</b>	<b>-0.15%</b>	<b>-0.20%</b>	<b>-0.19%</b>	<b>-0.81%</b>	<b>-2.14%</b>
Total Operating Expense	<b>95.81%</b>	<b>96.37%</b>	<b>92.89%</b>	<b>93.80%</b>	<b>93.26%</b>	<b>102.12%</b>
EBIT	<b>4.19%</b>	<b>3.63%</b>	<b>7.11%</b>	<b>6.20%</b>	<b>6.74%</b>	<b>-2.12%</b>
Interest Inc.(Exp.), Net-Non-Op., Total	<b>-1.01%</b>	<b>-0.46%</b>	<b>-0.78%</b>	<b>-0.77%</b>	<b>-1.24%</b>	<b>-0.58%</b>
EBT	<b>3.18%</b>	<b>3.18%</b>	<b>6.32%</b>	<b>5.42%</b>	<b>5.50%</b>	<b>-2.70%</b>
Provision for Income Taxes	<b>0.51%</b>	<b>0.41%</b>	<b>1.02%</b>	<b>0.15%</b>	<b>1.10%</b>	<b>-0.85%</b>
Net Income After Taxes	<b>2.67%</b>	<b>2.77%</b>	<b>5.31%</b>	<b>5.27%</b>	<b>4.40%</b>	<b>-1.85%</b>
Minority Interest	<b>-0.06%</b>	<b>-0.01%</b>	<b>0.00%</b>	<b>-0.02%</b>	<b>-0.01%</b>	<b>-0.01%</b>
Net Income	<b>2.61%</b>	<b>2.76%</b>	<b>5.30%</b>	<b>5.25%</b>	<b>4.39%</b>	<b>-1.86%</b>

Source: Calculation

From Income statement of year 2018, we can see that both company; IRPC and TOP has similar cost structure. The percentage per total revenues of each expense and costs are much similar and the difference are less than 100 bps.



**Table 1.20 Asset B/S Common size analysis**

<b>BS</b>	<b>TOP</b>	<b>IRPC</b>	<b>IRPC</b>	<b>IRPC</b>	<b>IRPC</b>	<b>IRPC</b>
	<b>2018</b>	<b>2018</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>	<b>2014</b>
<b>Assets</b>						
Cash and Short Term	<b>39.93%</b>	<b>1.28%</b>	<b>1.16%</b>	<b>1.18%</b>	<b>2.19%</b>	<b>1.23%</b>
Investments						
Accounts Receivable - Trade, Net	<b>9.07%</b>	<b>6.69%</b>	<b>6.93%</b>	<b>5.78%</b>	<b>5.48%</b>	<b>6.87%</b>
Total Receivables, Net	<b>10.13%</b>	<b>8.17%</b>	<b>7.78%</b>	<b>6.37%</b>	<b>6.12%</b>	<b>9.48%</b>
Total Inventory	<b>10.70%</b>	<b>15.60%</b>	<b>16.28%</b>	<b>14.96%</b>	<b>13.06%</b>	<b>15.57%</b>
Prepaid Expenses	<b>0.57%</b>	<b>0.13%</b>	<b>0.13%</b>	<b>0.09%</b>	<b>0.07%</b>	<b>0.09%</b>
Other Current Assets, Total	<b>0.00%</b>	<b>0.37%</b>	<b>0.43%</b>	<b>0.51%</b>	<b>0.61%</b>	<b>0.74%</b>
Total Current Assets	<b>61.33%</b>	<b>25.56%</b>	<b>25.78%</b>	<b>23.12%</b>	<b>22.05%</b>	<b>27.11%</b>
Property/Plant/Equipment, Total - Gross	<b>70.31%</b>	<b>112.80%</b>	<b>109.20%</b>	<b>110.36%</b>	<b>109.64%</b>	<b>98.56%</b>
Property/Plant/Equipment, Total - Net	<b>29.76%</b>	<b>68.37%</b>	<b>68.85%</b>	<b>69.71%</b>	<b>70.36%</b>	<b>61.96%</b>
Accumulated Depreciation, Total	<b>-40.55%</b>	<b>-44.43%</b>	<b>-40.35%</b>	<b>-40.64%</b>	<b>-39.28%</b>	<b>-36.60%</b>
Intangibles, Net	<b>1.13%</b>	<b>0.30%</b>	<b>0.37%</b>	<b>0.47%</b>	<b>0.69%</b>	<b>0.82%</b>
Intangibles - Gross	<b>1.85%</b>	<b>2.18%</b>	<b>2.11%</b>	<b>2.18%</b>	<b>2.33%</b>	<b>2.31%</b>

**Table 1.20 Asset B/S Common size analysis (cont.)**

Accumulated Intangible Amortization	-0.72%	-1.88%	-1.74%	-1.71%	-1.65%	-1.49%
Long Term Investments	6.02%	5.30%	4.82%	5.21%	5.18%	4.99%
Note Receivable – Long Term	0.20%	0.00%	0.00%	0.00%	0.00%	2.03%
Other Long Term Assets, Total	1.55%	0.47%	0.17%	1.49%	1.72%	3.08%
Total Non-Current Assets	38.67%	74.44%	74.22%	76.88%	77.95%	72.89%
Total Assets	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Source: Calculation

From the common size of assets; comparing IRPC and TOP as of year 2018, TOP held higher current assets 61.33% from TOP and 25.56% from IRPC. Major item of TOP was cash and cash equivalent of 39.93% while IRPC held inventory as the biggest items in current assets of 15.60%. For non-current assets, mainly from net PPE, IRPC held PPE 68.37% of total assets while TOP held only 29.76%.

**Table 1.21 L&E B/S Common size analysis**

Liabilities	TOP	IRPC	IRPC	IRPC	IRPC	IRPC
	2018	2018	2017	2016	2015	2014
Accounts Payable	8.13%	14.37%	14.11%	11.48%	15.78%	15.86%
Accrued Expenses	0.04%	1.27%	1.19%	1.31%	1.34%	0.82%
Notes Payable/Short Term Debt	0.89%	3.67%	1.60%	3.56%	0.14%	5.43%
Current Port. of LT Debt/Capital Leases	1.69%	3.89%	5.78%	11.43%	2.61%	4.73%

**Table 1.21 L&E B/S Common size analysis (cont.)**

Other Current liabilities, Total	<b>3.40%</b>	<b>3.60%</b>	<b>4.07%</b>	<b>2.63%</b>	<b>2.32%</b>	<b>1.93%</b>
Total Current Liabilities	<b>14.15%</b>	<b>26.80%</b>	<b>26.74%</b>	<b>30.42%</b>	<b>22.19%</b>	<b>28.77%</b>
Total Long-Term Debt	<b>37.27%</b>	<b>23.88%</b>	<b>24.47%</b>	<b>21.31%</b>	<b>30.17%</b>	<b>27.18%</b>
Total Debt	<b>39.86%</b>	<b>31.44%</b>	<b>31.85%</b>	<b>36.31%</b>	<b>32.93%</b>	<b>37.34%</b>
Deferred Income Tax	<b>0.01%</b>	<b>0.00%</b>	<b>0.02%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>
Minority Interest	<b>1.77%</b>	<b>0.05%</b>	<b>0.07%</b>	<b>0.05%</b>	<b>0.05%</b>	<b>0.04%</b>
Other Liabilities, Total	<b>1.48%</b>	<b>1.43%</b>	<b>1.27%</b>	<b>1.28%</b>	<b>1.13%</b>	<b>2.35%</b>
Total Non-Current Liabilities	<b>40.53%</b>	<b>25.36%</b>	<b>25.84%</b>	<b>22.64%</b>	<b>31.35%</b>	<b>29.57%</b>
Total Liabilities	<b>54.69%</b>	<b>52.16%</b>	<b>52.58%</b>	<b>53.06%</b>	<b>53.54%</b>	<b>58.33%</b>
<b>Shareholders Equity (THB Millions)</b>						
Common Stock, Total	<b>7.59%</b>	<b>11.20%</b>	<b>11.07%</b>	<b>11.85%</b>	<b>12.52%</b>	<b>12.55%</b>
Additional Paid-In Capital	<b>0.91%</b>	<b>15.66%</b>	<b>15.48%</b>	<b>16.57%</b>	<b>17.51%</b>	<b>17.55%</b>
Retained Earnings (Accumulated Deficit)	<b>36.85%</b>	<b>21.05%</b>	<b>20.94%</b>	<b>18.55%</b>	<b>16.52%</b>	<b>11.86%</b>
Treasury Stock - Common	<b>0.02%</b>	<b>-0.07%</b>	<b>-0.07%</b>	<b>-0.07%</b>	<b>-0.08%</b>	<b>-0.08%</b>
Other Equity, Total	<b>-0.07%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.04%</b>	<b>-0.02%</b>	<b>-0.21%</b>
Other Equity	<b>-0.07%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.04%</b>	<b>-0.02%</b>	<b>-0.21%</b>
Other Comprehensive Income	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>
Total Equity	<b>45.31%</b>	<b>47.84%</b>	<b>47.42%</b>	<b>46.94%</b>	<b>46.46%</b>	<b>41.67%</b>
Total Liabilities & Shareholders' Equity	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>

Source: Calculation

Funding Structure of IRPC and TOP are quite similar. TOP held 54.69% liability and 45.31% equity while IRPC held 52.16% liabilities and 47.84% equity. TOP has higher portion of total debt of 39.86% which 37.27% from long-term debt, IRPC has total debt of 31.44% which 23.88% from long-term debt. For Equity part, TOP has higher Retained earning which are 36.85% while IRPC has only 21.05%, but the items that made equity part of IRPC similar to TOP is from additional paid-in capital which is 15.66%.

### 1.5.4 ROE's Dupont Analysis

**Table 1.22 ROE Dupont analysis**

IRPC	2018	2017	2016	2015	2014	TOP	2018	2017	2016	2015	2014
Asset	1.53	1.20	1.10	1.31	1.73	Asset	1.57	1.51	1.34	1.52	1.93
Turnover						Turnover					
Net Profit Margin (%)	2.8	5.3	5.3	4.4	(1.9)	Net Profit Margin(%)	3.20	9.10	8.70	4.80	(1.20)
ROA (%)	4.2	6.4	5.8	5.8	(3.2)	ROA (%)	5.00	13.80	11.70	7.30	(2.30)
Asset/Equity	2.10	2.12	2.14	2.27	2.27	Asset/Equity	2.21	1.87	2.04	2.08	2.32
ROE (%)	8.9	13.5	12.4	13.1	(7.3)	ROE (%)	10.1	26.9	24.0	16.0	(5.3)

Source: Calculation

In term of ROE, we can analyze on the source of return on equity of firm through the ROE Dupont's components; net profit margin, asset turnover and equity multiplier.

ROE of IRPC of year 2015-2017 was just half of ROE of TOP. Still in year 2018, the ROE of IRPC is closer to TOP's which is 8.9% while the TOP's ROE is 10.1%. This is due to huge decreases in NPM of TOP. The net profit margin of TOP decreased of 5.9% from year 2017 to 2018 while IRPC is also on the same trend as TOP but the net profit margin of IRPC decreased only 2.5%, still there is improvement in asset turnover in both firms, but the impact is too small comparing to the decrease in NPM. The higher in ROA but lower in net profit margin is from higher volume of sales, but the sharply decrease in crude oil price caused the lower margin.

From ROE Dupont's analysis, TOP is more attractive to invest than IRPC mainly because of higher net profit margin and TOP is number 1 in the industry which hold the highest market share.

### 1.5.5 Solvency Analysis

**Table 1.23 IRPC Solvency analysis**

IRPC Solvency Ratio	2018	2017	2016	2015	2014
LT Debt to Equity	0.51	0.49	0.55	0.65	0.55
Debt to Equity	0.66	0.72	0.74	0.8	0.72
Debt ratio	0.32	0.34	0.35	0.35	0.32
Current Ratio	0.96	0.86	0.86	0.96	1.12
Quick Ratio	0.36	0.31	0.32	0.4	0.5

Source: Calculation

**Table 1.24 TOP Solvency analysis**

TOP's Solvency Ratio	2018	2017	2016	2015	2014
LT Debt to Equity	0.82	0.52	0.64	0.8	0.81
Debt to Equity	0.88	0.54	0.71	0.82	0.96
Debt ratio	0.4	0.29	0.35	0.39	0.41
Current Ratio	4.33	3.78	3.39	4.97	2.68
Quick Ratio	3.58	2.8	2.42	3.94	1.88

Source: Calculation

For Solvency Ratio, IRPC has much lower liquidity from the current ratio comparing to TOP. The current ratio of IRPC is only 0.96 while TOP's is 4.33, however the current ratio of IRPC has been improving over year 2016-2018. In term of debt to equity ratio, IRPC has lower debt to equity and debt ratio of year 2018 comparing to year 2015-2017. While TOP has the different trend, its debt ratio and debt to equity is higher, and most of the debt is from long-term debt. The quick ratio of IRPC is lower than one which mean the company does not has enough quick assets to pay for its current liabilities while the quick ratio of TOP is 3.58 which is much higher than IRPC, however there is

improvement of liquidity of IRPC as the current ratio and quick ratio has been a bit increasing from last 3 years.

## 1.6 Valuation (Relative)

### 1.6.1 (Relative Valuation) Investment Summary

We issued SELL Recommendation on IRPC Public Company Limited,

**Table 1.25 Relative Valuation Comparable Company Analysis**

	Band Value	Band Rank	IRPC 5 yrs Median	Selected Peer 5 yrs Median	Selected Peer Median Rank	Oil & Gas T12M Median	Oil & Gas T12M Median Rank	Forecast Price	Summary
1. Share Price	UV	Below SD1	-	-	-	-	-	-	<p>UV = 6</p> <p>Indicators</p> <p>OV = 10</p> <p>indicators</p>
2. Enterprise Value	OV	Above SD	-	-	-	-	-	-	
3. trailing P/E	OV	Above SD2	12.7	10.4	OV	7.9	OV	-	
4. forward P/E	UV	Below SD	-	-	-	-	-	OV	
5. trailing P/BV	UV	Below SD1	1.19	1.29	UV	0.9	OV	-	
6. forward P/BV	OV	Above SD	-	-	-	-	-	UV	
7. trailing EV/EBITDA	OV	Above SD	9.2	6.9	OV	5.9	OV	-	
8. forward EV/EBITDA	UV	Below SD	-	-	-	-	-	-	

UV = Undervalued

OV = Overvalued

All in all, 6 Undervalued indicators vs 10 Overvalued indicators; with relative valuation method, we would recommend SELL on IRPC Public Company Limited

In Multiple Band Ranking of relative valuation method; we ranked all 8 factors, noted this will also included share price and Enterprise Value as well. We had 4 Undervalued factors (Share Price, forward P/E, trailing P/BV, forward EV/EBITDA) & 4 Overvalued factors (Enterprise Value, trailing P/E, forward P/BV, trailing

EV/EBITDA). So Multiple Band had equally between Undervalued & Overvalued. Next, Selected Peer 5 yrs Median Ranking, relevant data can be applied only to trailing relative valuation method only, it does not work with Share Price, Enterprise Value, nor any type of forward multiple. As it ranked, 1 Undervalued factor & 2 Overvalued factors. Then for Oil & Gas T12M Median Ranking, same idea as Selected Peer 5 yrs Median Ranking, can apply to only trailing relative valuation, which yield all 3 Overvalued factors.

In term of forecast price of relative valuation method; we yield 3 scenarios from (1) Forward P/E Ratio, (2) Forward P/BV Ratio, and (3) Forward EV/EBITDA Ratio. As the summarized of each scenario helps forecast prediction for Share Price and Enterprise Value, our analysis is considerable only until end of 2019 and end of 2020, with each method of relative

**Valuation forward P/E ratio will yield share price of -0.91 Baht per share and 3.21 Baht per share, respectively.** While latest share price (data from 13 Dec 2019), is 3.62 Baht per share, considering Overvalued.

**Valuation forward P/BV ratio will yield share price of 3.99 Baht per share and 3.44 Baht per share, respectively (which if average will be 3.72 Baht per share).** While latest share price (data from 13 Dec 2019), is 3.62 Baht per share, considering Undervalued.

And lastly, **Forward EV/EBITDA** Ratio cannot yield forecast share price, rather, it can yield EV or **Enterprise Value which is 62,096 Million Baht for the end of 2019 and 104,621 Million Baht for the end of 2020.** While latest Enterprise Value (data from 13 Dec 2019), is 164,047 million Baht, this forecast assumed way too much difference. Thus, in my humble opinion, this relative valuation should be not be good relative valuation indicator.

As a result, 6 Undervalued indicators vs 10 Overvalued indicators; with relative valuation method, we would recommend SELL on IRPC Public Company Limited

### **1.6.2 Theory & Definition relative valuation**

According to Corporate Finance Institute Education Inc., had defined 2 common type of relative valuation, comparable company analysis and precedent

transaction analysis. Precedent transaction analysis is method to value company by historical transaction which had been takeover by the mergers & acquisitions, where IRPC does not mainly involve with. As for comparable company analysis, it guidance to narrow down into 4 type of relative valuation, which are

- EV/Sale ratio
  - = Enterprise Value / Sales
  - Where EV = Market Capitalization + Market Value of Debt – Cash and Equivalents
- EV/EBITDA ratio
  - = Enterprise Value / EBITDA
  - Where EBITDA = Net Income + Interest + Taxes + Depreciation + Amortization
- P/E ratio
  - = Share Price / Earnings per Share
  - Where P = Price per Share &
  - Where E = earnings per share (EPS) = (Net Income - Preferred Dividends) / Weighted Average Shares Outstanding
- Price/Cash Flow
  - = Share Price / Cash Flow
  - Where; Cash Flow = Operating Cash Flow = Net Income + Non-Cash Expenses - Increase in Working Capital
- Price/Book
  - = Share Price / Net Book Value per Share
  - Where; Net Book Value per Share = (Stockholders' Equity - Preferred Stock) / Average Share Outstanding
- Dividend Yield
  - = Dividend per share / Market value per share
  - Where DPS (Dividend per share) = Total Dividends Paid / Shares Outstanding

This can be helpful starting guideline to start relative valuation before deep relative valuation which will be explain later. Here is the Table, compare historical data



from 2018 balance sheet & income statement of 5 peer competitors within petroleum or energy sector industry, compared to IRPC.

### 1.6.2.1 General Comparable Analysis

**Table 1.26: General Comparable Analysis**

Component Details	Global Rank	IRPC.BK F12M	IRPC.BK T12M	Oil & Gas F12M Median	Oil & Gas T12M Median	Selected Peer F12M Median	Selected Peer T12M Median
EV/Sales	91	0.5	0.5	0.5	0.4	0.3	0.2
EV/EBITDA	66	7.5	9.4	4.7	5.9	5.7	7.5
P/E	54	12.7	20.8	10.3	7.9	9.5	15.2
Price/Cash Flow	88	4.6	5.0	4.7	4.0	4.6	6.3
Price/Book	88	0.8	0.8	1.1	0.9	0.9	1.0
Dividend Yield	78	4.3%	3.0%	4.4%	3.4%	5%	4%

Component Details	Global Rank	TOP.BK F12M	TOP.BK T12M	Global Rank	SPRC.BK F12M	SPRC.BK T12M
EV/Sales	89	0.6	0.4	99	0.2	0.2
EV/EBITDA	71	8.2	6.7	82	4.6	8.4
P/E	67	10.8	15.9	44	9.9	115.9
Price/Cash Flow	77	5.8	7.6	64	6.0	12.3
Price/Book	77	1.0	1.1	80	1.0	1.0
Dividend Yield	75	3.9%	3.3%	89	5.9%	3.1%

Component Details	Global Rank	BCP.BK F12M	BCP.BK T12M	Global Rank	ESSO.BK F12M	ESSO.BK T12M
EV/Sales	96	0.4	0.2	99	0.2	0.3

**Table 1.26: General Comparable Analysis (cont.)**

EV/EBITDA	86	6.5	4.1	77	4.9	10.0
P/E	77	9.0	14.1	81	6.0	14.5
Price/Cash Flow	92	3.5	4.5	91	3.2	4.9
Price/Book	91	0.7	0.8	87	0.8	1.0
Dividend Yield	85	5.0%	3.7%	96	8.2%	4.4%

Source: Reuter data (Nov 2019)

As far as the table is laid out, each competent is being compared to its peer, the color of the table indicates the following:

- IRPC = Yellow
- Median Oil & Gas Industry = Pink
- Thai Oil Public (TOP) = Blue Ocean
- Star Petroleum Refining Company (SPRC) = Orange
- Bangchak (BCP) = Green
- ESSO = Blue

Also, with each relative valuation, there are EV/Sales, EV/EBITDA, P/E, Price/Cash Flow, Price/Book, Dividend Yield. In each valuation, there will be F12M which is Forward Relative Valuation for future 12 months, and T12M which is Trailing Relative Valuation for past 12 months.

In each component, will be coloring based upon its performance compared to its peer and Median Oil & Gas Industry; the **greener the box is, the better**, on the other hand, redder the box is, the worse it becomes. This method of coloring is based on company's perspective. In deeper dimension, each number is rather subjective, higher or lower does not really means it should be better than its peer, but the color would give the look to arrange the ranking easier than plain black & white table.

I would want to indicate from Shareholders' perspective as well, but it will be too much to input this data. Sometimes when the ratio is good for the company, it may not be good for Shareholders, and vice versa, and sometimes it also depends on its condition as well.

In order to understanding relative valuation multiple, there are 4 steps to deep drive as following:

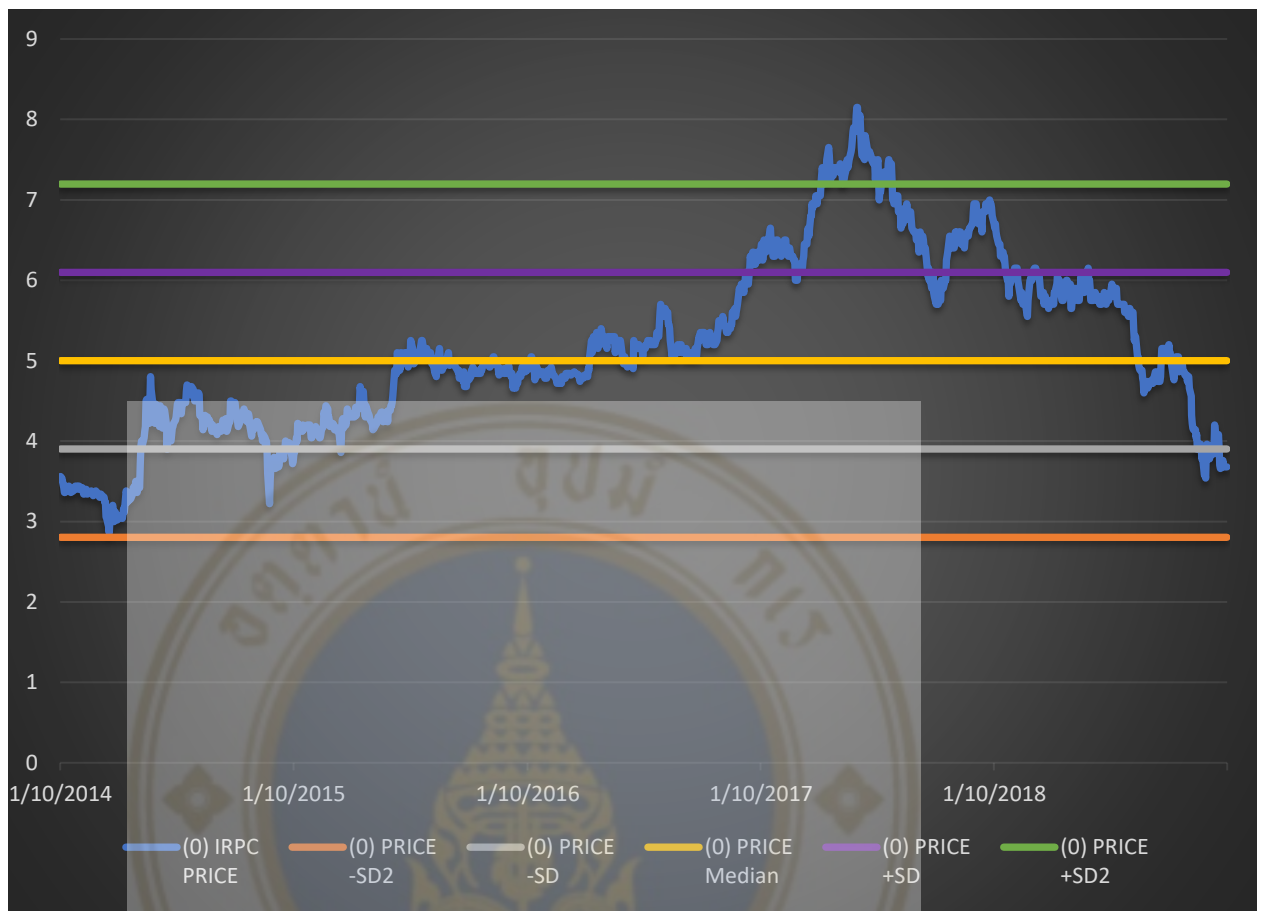
1. Define the multiple – understand which type of multiple will be use and will be estimated, which will be the numerator and the denominator.
2. Describe the multiple – have a standardize or “cross sectional distribution”, to have median (not the Median, because median is clearer as it represent the middle value of series of the numbers) of peer competitor within the same sector or same industry.
3. Analyze the multiple – deeply understand the fundamentals that drive each multiple, the nature of the relationship between multiple & variable, with great assumptions input as well.
4. Apply the multiple, real application test – using comparable method, does the result goes as theory or not, either use to compare to average of the sector & industry.

Source: CFI Education Inc. (n.d.)

In each relative valuation model; we will layout the graph for time period of 5 years; from Q4/2014 – Q3/2019; which we will plot the graph as daily data. While the graph will be shown as 6 types of line as description as following:

- Blue Line = Daily data
- Green Line = Median data + Stand Deviation (2 times)
- Purple Line = Median data + Stand Deviation (1 time)
- Yellow Line = Median data
- Gray Line = Median data - Stand Deviation (1 time)
- Orange Line = Median data - Stand Deviation (2 times)

### 1.6.3 Share Price



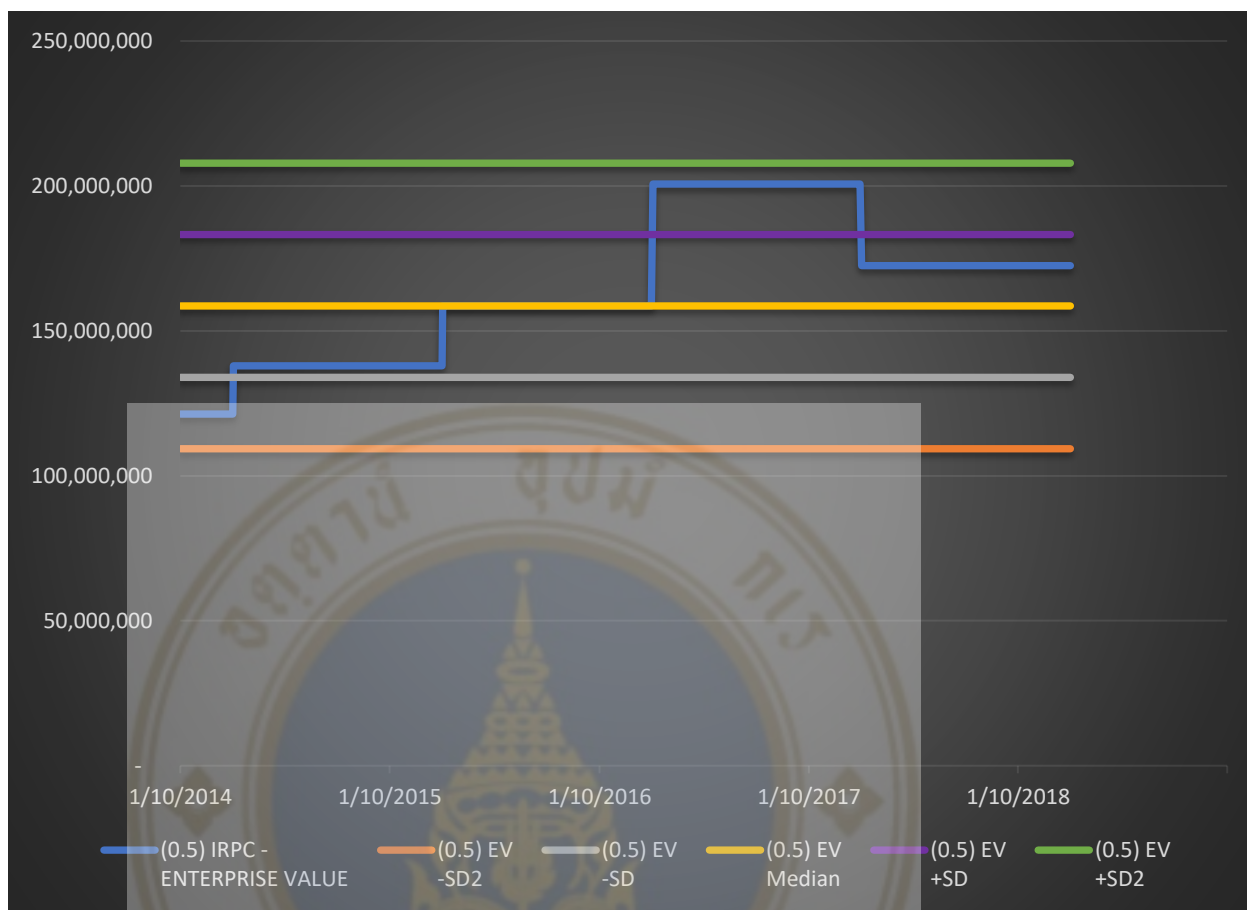
**Figure: 1.21 Share Price**

Source: own calculation

Share price is what determine what investor have speculated this company's valuation, in term of being the stakeholder, being partly ownership of the company.

As current price, it is sitting at the end of Q3/2019, \$3.68 per share, where as the Median is around \$5.05 per share. The current price is undervalued at below SD1.

### 1.6.4 Enterprise Value



**Figure: 1.22 Enterprise Value**

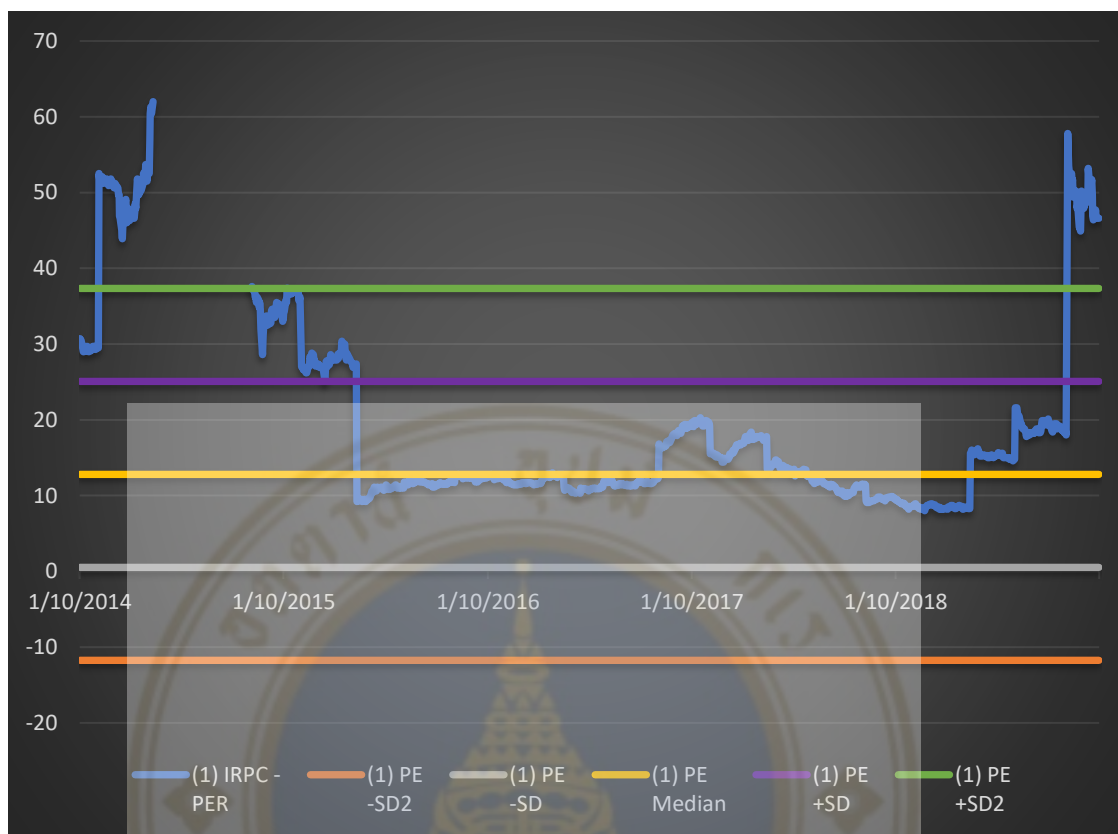
Source: own calculation

Enterprise Value is measure of a company's total value, where  $EV = \text{Market Capitalization} + \text{Market Value of Debt} - \text{Cash and Equivalents}$ . It can vary daily, due to we value the market value of company as the time now.

At current Enterprise Value, it is sitting at the end of Q3/2019, \$172.5 million [the data represents from Q3/2014 up to only Q4/2018, as data from Q1/2019 – Q32019 are not available), whereas the Median is around \$158.6 million. The current price is slightly overvalued, between Median and Median + SD.

Source: Reuter data (Nov 2019) and own calculation

### 1.6.5 Trailing P/E



**Figure: 1.23 Trailing P/E**

Source: own calculation

#### 1.6.5.1 Usage

Trailing P/E ratio is what determine what ratio between share price to EPS or ‘earning per share’, it gave how many years it would take to receive, for example invested \$100, would generate the whole \$100 back, in term of years.

High P/E means the company would take longer to pay back their shareholder, but on company’s perspective, it means they are very valuable, or even overvalued for their current market share. On the other hand, Low P/E means it can be undervalued, which will also attract new investors, although, it really depends on company whether what would they keep as retain earning & pay out as dividend, after they shown their earning per share.

As current ratio, it is sitting at the end of Q3/2019, 46.6 times, where as the Median is around 12.80 times. The current ratio is way overvalue, staying way above the Median + SD2. There are big jump at early August 2019, from around 18 times to 57.8

times all sudden. This was due to quarterly announce of their Financial Statement is out for public.

#### 1.6.5.2 Limitation

The limitation is that Trailing P/E ratio does not work on start-up or any company that generate negative profit or when it is zero or close to zero, it won't be any useful for data analysis.

As example, between February 2015 to July 2015, there are missing gap of data (Blue Line; Median), which means during those periods, the company does not generate any profit.

#### 1.6.5.3: Competitor comparison

**Table 1.27: Competitor comparison (Trailing P/E)**

<b>Hist P/E, FY</b>	<b>2018</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>	<b>2014</b>	<b>2013</b>	<b>5 yrs Median</b>
Oil & Gas T12M Median	7.9	7.9	7.9	7.9	7.9	7.9	7.9
IRPC	15.2	12.7	10.1	9.3	-	80.5	12.7
TOP	13.3	8.5	6.9	11.1	-	12.3	11.1
SPR	18.4	8.3	6.2	4.5	-	-	7.3
BCP	17.8	10.0	9.7	10.9	62.8	8.3	10.5
ESSO	15.9	8.4	6.7	10.2	-	-	9.3
<b>Selected Peer Median</b>	<b>16.8</b>	<b>8.4</b>	<b>6.8</b>	<b>10.6</b>	<b>62.8</b>	<b>10.3</b>	<b>10.4</b>

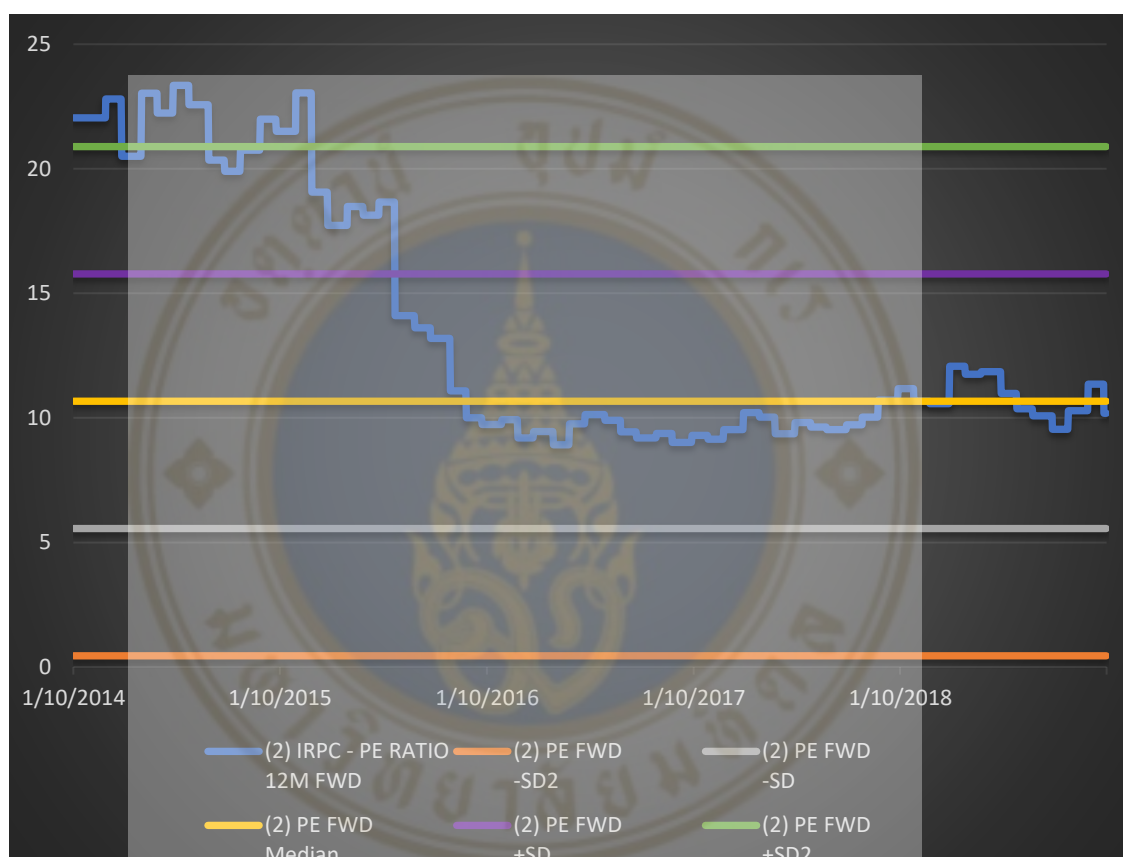
Source: Reuter data (Nov 2019) and own calculation

With the peer comparison, the average peer industry in Oil & Gas has P/E ratio is 7.9 times, it can be easily seeing that in 2018, it was 'a change' year for industry in Oil & Gas. The perspective whether the P/E ratio is increase from 2017 of average 8.4 times, to 2018 of average 16.8 times to rather subjectively depends on who and how we

look from which angle of valuation. This median is better than average method since it can exclude some data that are not within considerable range such as 62.8 times or 80.5 times. Overall, with Selected Peer Median, for 5 years median data resulted 10.4 times of P/E ratio Trailing.

*Noted that 'Selected Peer Median' is not included IRPC data*

### 1.6.6 Forward P/E



**Figure: 1.24 Forward P/E**

Source: own calculation

#### 1.6.6.1 Usage

Forward P/E ratio is difference to Trailing P/E ratio, Forward P/E ratio will determine based in the future expecting, estimating, or forecasting EPS which are provided from research analysts. There would be some needed to have analyst consensus to determine future EPS too, to agree that most of analysis are generating in the great direction of speculating.



As current ratio, it is sitting at the end of Q3/2019, 10.19 times, whereas the Median is around 10.67 times. The current ratio is very close to Median.

#### 1.6.6.2 Limitation

The limitation of Forward P/E ratio is like Trailing P/E ratio, it does not work on start-up or any company that generate negative profit or when it is zero or close to zero.

#### 1.6.6.3 Future Forecasting Share Price 2019-2020

Year	2019	2020	2021	2022	2023	2024
<b>Forward Share Price = (NP * P/E) / No. Share</b>						
Net Profit	(1,219)	6,932	7,211	7,500	7,644	7,792
Forward Ratio	15.2	9.5	9.5	9.5	9.5	9.5
Share No. amount	20434	20434	20434	20434	20434	20434
<b>Forward Share Price</b>	<b>- 0.91</b>	<b>3.21</b>	<b>3.34</b>	<b>3.47</b>	<b>3.54</b>	<b>3.61</b>

**Figure1.25: Future Forecasting Share Price 2019-2020**

Source: own calculation

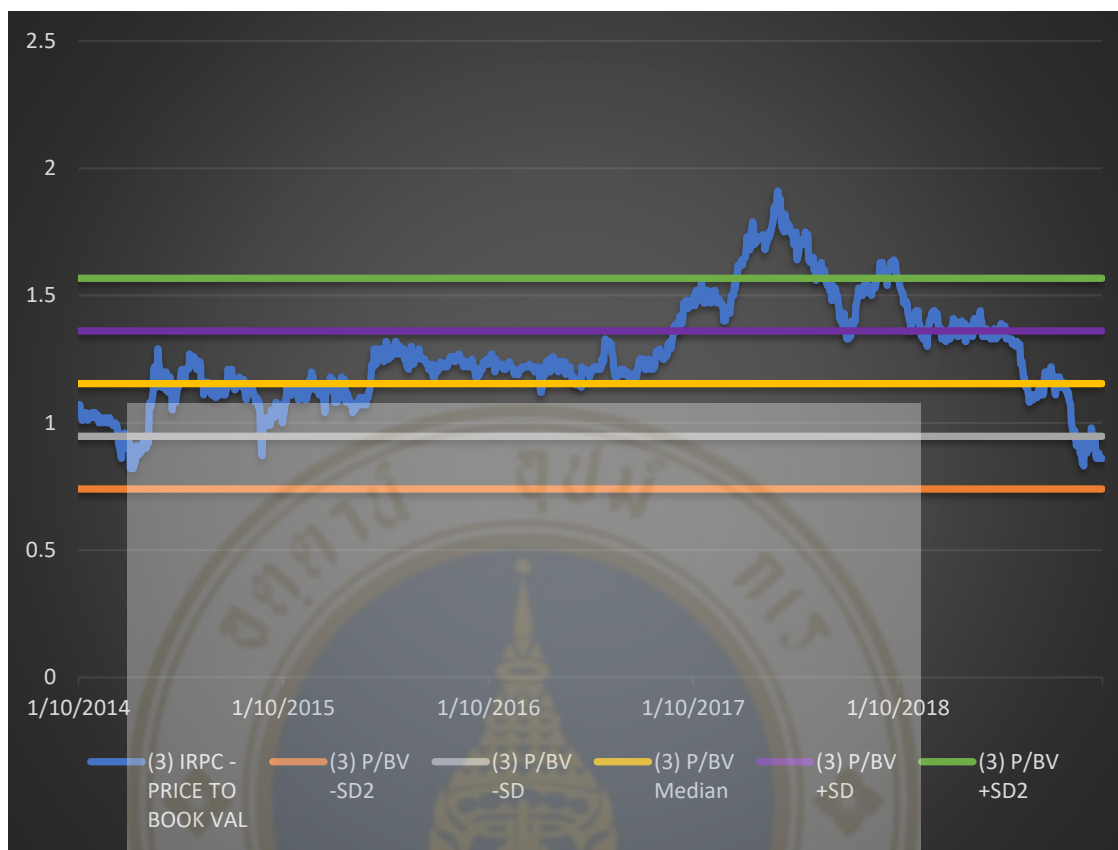
For the forward P/E ratio, we firstly projected from the growth of using growth rate based on oil price projection, in future projection, year 2020 to 2024, we had as following; 0.6%, 3.2%, 3.1%. 0%, and 0% respectively. Other revenue like petrochemical we issued at constant growth rate, at 2.5%. Overall, the growth of sale are expected to grow at 3.5% constantly. Then we projected COGS to be estimated between 93.6% of Revenue and SG&A to be estimated around 2.8%, overall, we can project estimated EBT, EBIT, and Net Profit with this following method. For more precisely calculation, please refer to the excel sheet.

After, that we can leverage forward P/E ratio from Reuter's data, their estimation of Forward P/E ratio came out as 12.72 times. Although my intention will be using 'Selected Peer F12M Median', the reasons is that it selectively choose the main peer of IRPC, 4 companies, while excluded IRPC which is better than Oil & Gas F12M Median, 'Selected Peer F12M Median' for P/E is 9.5 times (while based on my calculation, Forward P/E ratio of IRPC came out as 10.67 times).

Our estimated net profit turned out to be negative for 2019 as (1,219) Million Baht, which yield result of calculation share price to -0.91 Baht per share.



### 1.6.7 Trailing P/BV



**Figure 1.27: Trailing P/BV**

Source: own calculation

#### 1.6.7.1 Usage

Price to book value (P/BV) ratio, is exactly same as market to book ratio. Where as P/BV is Share Price/Net Book Value per Share, while M/B is Market Capitalization/Net Book Value (Net Book Value = Total Assets – Total Liabilities)

High P/BV indicates that the share price is overvalued or performing very well, it would not attract new investors. On the other hand, Low P/BV indicates that the share price is undervalued or performing very poorly, even up to about to bankrupt too.

As current ratio, it is sitting at the end of Q3/2019, 0.86 time, where as the Median is around 1.23 time. The current ratio is undervalued, as it is below Median + SD as well.

### 1.6.7.2 Limitation

With P/BV ratio, for the company, it would be eased to have higher P/BV ratio. But for new investors or even current investors/stakeholders, low P/BV indicates that it can be great opportunity to buy at lower price or it can be dangerous zone for the company to be bankrupted. Also, it would be hard to determine any type of company where they hold low asset, such as service type company, start-up type company, or technology type company.

### 1.6.7.3 Competitor comparison

**Table 1.28: Competitor comparison (Trailing P/BV)**

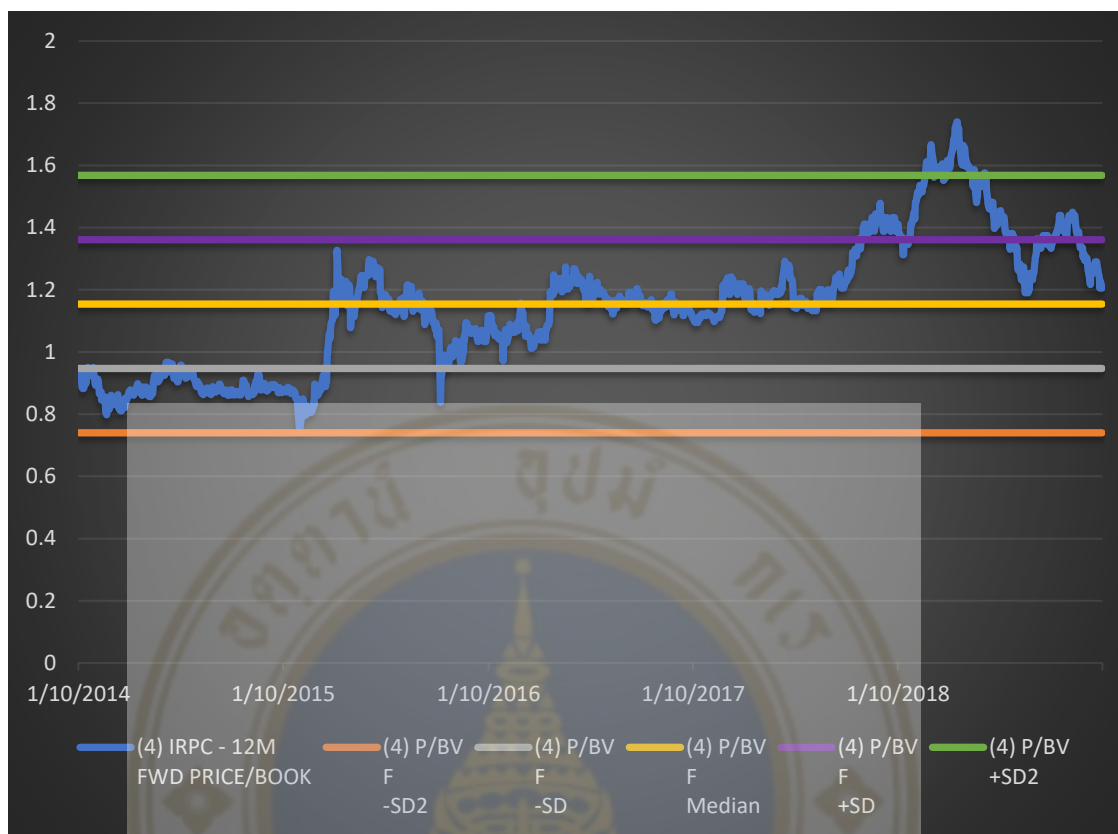
Hist Price/Bk, Tot Eqty, FY	2018	2017	2016	2015	2014	2013	5 yrs Median
Oil & Gas T12M Median	0.90	0.90	0.90	0.90	0.90	0.90	0.90
IRPC	1.34	1.64	1.21	1.16	0.92	0.88	1.19
TOP	1.11	1.73	1.38	1.46	1.03	1.25	1.32
SPR	1.08	1.76	1.29	1.07	-	-	1.18
BCP	1.02	1.23	1.17	1.28	1.31	1.11	1.20
ESSO	1.37	2.16	2.14	1.26	1.33	0.94	1.35
<b>Selected Peer Median</b>	<b>1.10</b>	<b>1.74</b>	<b>1.33</b>	<b>1.27</b>	<b>1.31</b>	<b>1.11</b>	<b>1.29</b>

Source: Reuter data (Nov 2019) and own calculation

With the peer comparison, the average peer industry in Oil & Gas has P/BV ratio is 0.90 times, since 2013 until 2016, P/BV range was around 1.11 times to 1.33 times, but 2017 was a great year that it has increase to even 1.74 times. Following to year 2018, a big crash to 1.10 times, as the Oil & Gas industry may not have great year in 2018. Overall, with Selected Peer Median, for 5 years median data resulted 1.29 times of P/BV ratio Trailing.

*Noted that 'Selected Peer Median' is not included IRPC data*

### 1.6.8 Forward P/BV



**Figure 1.28: Forward P/BV**

Source: own calculation

#### 1.6.8.1 Usage

Forward P/BV ratio is difference to Trailing P/BV ratio, Forward P/BV ratio will determine based in the future expecting, estimating, or forecasting Book Value, which are provided from research analysts. There would be some needed to have analyst consensus to determine future Book Value too, to agree that most of analysis are generating in the great direction of speculating.

As current ratio, it is sitting at the end of Q3/2019, 1.21 time, whereas the Median is around 1.15 time. The current ratio is very close to Median, only slightly above the Median.

#### 1.6.8.2 Limitation

The limitation of Forward P/BV ratio is like Trailing P/BV ratio, it can be confusing indicators when it is low, either great time to buy, time to bankrupt,

or low asset type company. There isn't valid data enough for peer competitor as well as too much assumption for balance sheet [pro forma] for forward data as well.

#### 1.6.8.3 Future Forecasting Share Price 2019-2020

Year	2019	2020	2021	2022	2023	2024
<b>Forward Share Price = (BV * P/BV) / No. Share</b>						
Book Value	82,547	79,829	82,761	80,661	80,673	80,678
Forward P/BV Ratio	0.99	0.88	0.88	0.88	0.88	0.88
Share No. amount	20434	20434	20434	20434	20434	20434
<b>Forward Share Price</b>	<b>3.99</b>	<b>3.44</b>	<b>3.57</b>	<b>3.48</b>	<b>3.48</b>	<b>3.48</b>

**Figure 1.29: Future Forecasting Share Price 2019-2020**

Source: own calculation

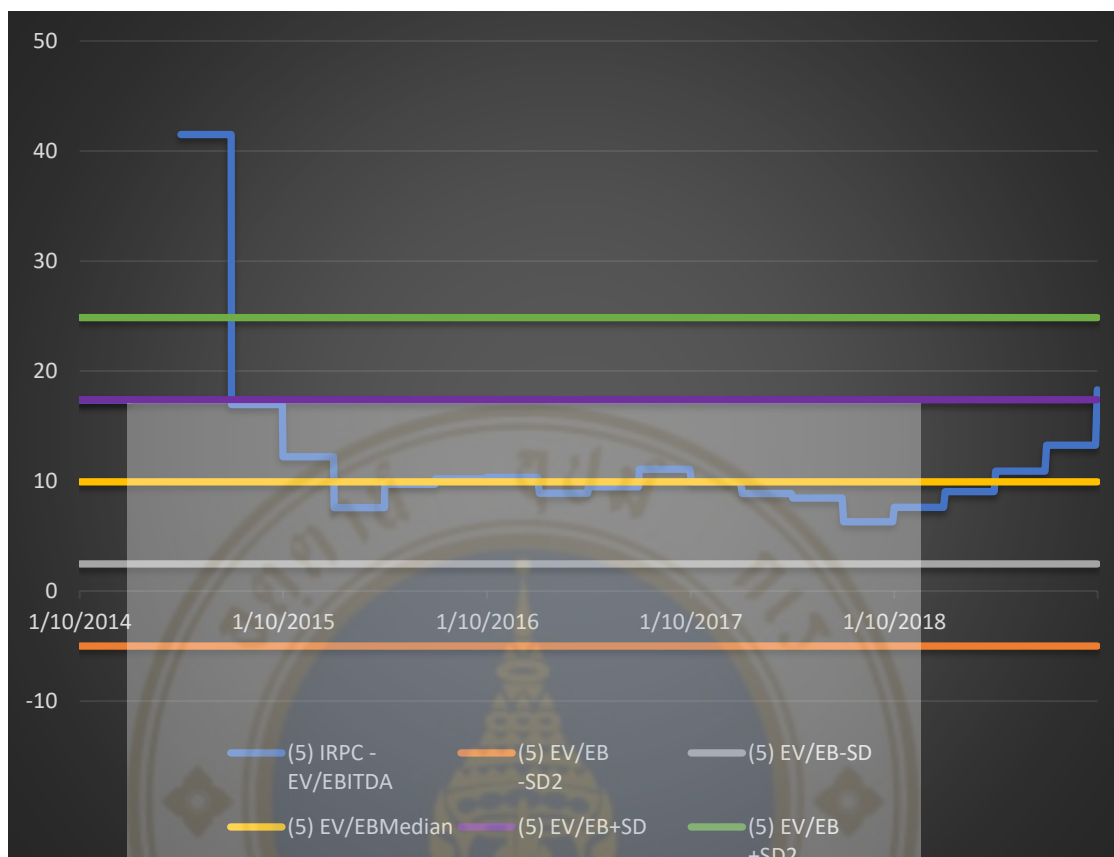
For Forward P/BV ratio can help do the assumption for future Share Price, like Forward P/E ratio, we can project estimated Book Value as above. In general idea, we need to speculate on growth assumption to build an ideal forecast balance sheet, there is no one way method, but our assumption mainly will be the constantly growth of balance sheet by incorporate estimated growth from data of 2018 and 2019. Such as on Forecast Asset; for both current asset and long-term asset, we incorporated the growth of ARTO, ITO, and CAPEX projection. While CAPEX also included many of new IRPC innovation project such as Project Maximum Aromatics (MARS), Project Ultra Clean Fuel (UCF), and Other investment and maintenance. On Forecast Liability, for both current liability and long-term debt, we incorporated the growth of APTO, short-term debt to total asset, and total debt to total asset. We can derive forecast "Book Value" section or Shareholders' Equity from those previous calculation we mentioned. For more precisely calculation, please refer to the excel sheet.

Then we get "Book Value", using 'Selected Peer F12M Median' just like Forward P/E ratio mentioned earlier in the paper, the reasons is that it selectively choose the main peer of IRPC, 4 companies, while excluded IRPC which is better than Oil & Gas F12M Median, 'Selected Peer F12M Median' for P/BV ratio is 0.88 times (while based on my calculation, Forward P/BV ratio of IRPC came out as 1.15 times).

Our estimated book value for 2019 is 82,547 Million Baht, which yield result of calculation share price to 3.99 Baht per share (very close to actual share



### 1.6.9 Trailing EV/EBITDA



**Figure 1.31: Trailing EV/EBITDA**

Source: own calculation

#### 1.6.9.1 Usage

EV/EBITDA is ratio from company's Enterprise Value (EV) to Earning before Interest, Taxes, Depreciation, & Amortization (EBITDA). This ratio will determine the entire value of the business, compare to its EBITDA on annual term. It works very well for stable & mature company, with low capital expenditure.

According to source: *corporatefinanceinstitute.com (n.d.)*, stated very detail 10 steps on how to calculate EV/EBITDA precisely as following:

*"10 steps to calculate EV/EBITDA and value a company:*

1. *Pick an industry (i.e. the beverage industry, as in our example)*
2. *Pick 5-10 companies in same or very close to its sector/industry*



3. *Select only companies that are similar in term of size, product, and close geographic focus*
  4. *Find 3-5 years historical data for each company as balance sheet & income statement*
  5. *Find share price, # of shares, and net debt for all selected companies*
  6. *Calculate EV for each company*
  7. *Divided EV by EBITDA for 3-5 years historical data*
  8. *Compare between companies of their EV/EBITDA*
  9. *Analysis if which is 'premium' or 'discounted'*
- EV/EBITDA*
10. *Summarize the EV/EBITDA that are suitable for the target company that we are valuing*

As current ratio, it is sitting at the end of Q3/2019, 18.28 times, whereas the Median is around 1.15 times. For addition data providing, the current ratio was around 13.25 times in September 2019, until the end of Q3/2019, then it suddenly jumped to 18.28 times, it stayed at this current ratio up to even the latest data provided, to October 2019 (not shown in graph). The current ratio is overvalued, staying way above the Median + SD.

#### 1.6.9.2 Limitation

EV/EBITDA would not work well with some company with good proxy for cash flow, it does not take capital expenditure in calculation especially high capital expenditure, and it is hard to determine the actual discount rate which is mostly subjective.

## 1.6.9.3 Competitor comparison

**Table 1.29: Competitor comparison (Trailing EV/EBITDA)**

Hist EV/EBITDA, FY	2018	2017	2016	2015	2014	2013	5 yrs Median
Oil & Gas T12M Median	5.9	5.9	5.9	5.9	5.9	5.9	5.9
IRPC	9.8	9.2	7.7	6.9	-	21.4	9.2
TOP	6.8	6.0	5.2	7.0	-	7.3	6.8
SPR	8.7	6.0	4.5	3.1	-	-	5.3
BCP	8.8	7.4	6.4	6.0	15.2	5.7	6.9
ESSO	11.3	6.7	6.5	10.2	-	19.7	10.2
<b>Selected Peer Median</b>	<b>8.7</b>	<b>6.4</b>	<b>5.8</b>	<b>6.5</b>	<b>15.2</b>	<b>7.3</b>	<b>6.9</b>

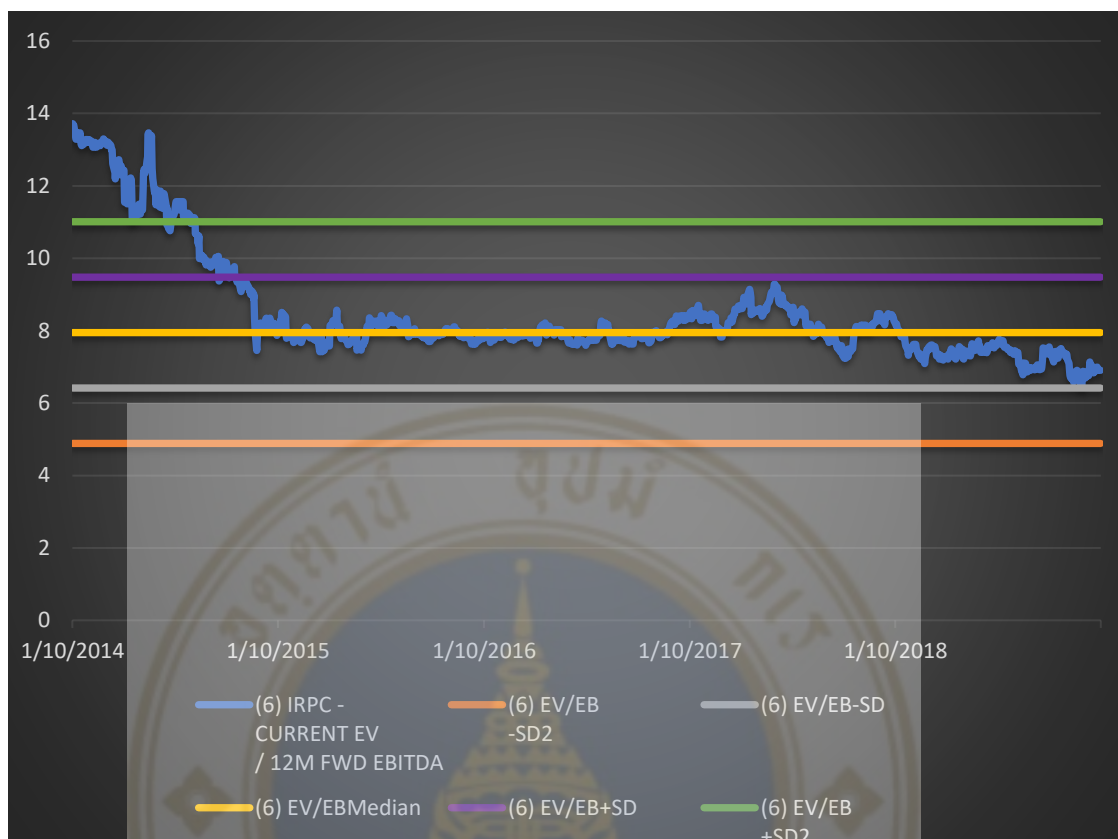
Source: Reuter data (Nov 2019) and own calculation

With the peer comparison, the average peer industry in Oil & Gas has EV/EBITDA ratio is 5.9 times. In general, for EV/EBITDA for each company, it would move based on EBITDA, meaning it will be adjusted every quarterly after the quarterly report is announce. But for peer comparison, it would be totally annual based. From the table, the fluctuation of EV/EBITDA ratio does not swing so much, the range sits between 5.8 times to highest point of 2018, at 8.7 times. Overall, with Selected Peer Median, for 5 years median data resulted 6.9 times of EV/EBITDA ratio Trailing.

*Noted that 'Selected Peer Median' is not included IRPC data*

Source: Reuter data (Nov 2019) and own calculation

### 1.6.10 Forward EV/EBITDA



**Figure 1.32: Forward EV/EBITDA**

Source: own calculation

#### 1.6.10.1 Usage

Forward EV/EBITDA ratio is difference to Trailing EV/EBITDA ratio, Forward EV/EBITDA ratio will determine based in the future expecting, estimating, or forecasting EBITDA, which are provided from research analysts. There would be some needed to have analyst consensus to determine future EBITDA too, to agree that most of analysis are generating in the great direction of speculating.

As current ratio, it is sitting at the end of Q3/2019, 6.90 times, whereas the Median is around 7.95 times. The current ratio is undervalued, as it is between Median and Median + SD.

#### 1.6.10.2 Limitation

The limitation of Forward EV/EBITDA ratio is like Trailing EV/EBITDA ratio, it does not take capital expenditure in calculation and it is hard to determine the actual discount rate

## 1.6.10.3 Future Forecasting Enterprise Value 2019-2020

Year	2019	2020	2021	2022	2023	2024
<b>Forward EV = (EV/EBITDA ratio) / Forward EBITDA</b>						
EBITDA	8,247	18,316	18,558	19,116	20,195	20,379
EV/EBITDA	7.53	5.71	5.71	5.71	5.71	5.71
<b>Forward EV</b>	<b>62,096</b>	<b>104,621</b>	<b>106,008</b>	<b>109,192</b>	<b>115,354</b>	<b>116,409</b>

**Figure 1.33: Future Forecasting Enterprise Value 2019-2020**

Source: own calculation

For Forward EV/EBITDA ratio can help do the assumption for future Enterprise Value, like Forward P/E ratio, we can project estimated EBIT as above. After getting EBIT, we need to find EBITDA for this EV/EBITDA ratio. Thus, we add depreciation and amortization back to get EBITDA. In term of forecasting future depreciation and amortization, we have average 5 years growth of each, calculated so that we estimated depreciation from 2020 to 2024, to have 8,012 million Baht. Amortization, we have data for 2019 as 226 million Baht and 2020 as 107 million Baht. For more precisely calculation, please refer to the excel sheet.

Then we get EBITDA, using ‘Selected Peer F12M Median’ just like Forward P/E ratio mentioned earlier in the paper, the reasons is that it selectively choose the main peer of IRPC, 4 companies, while excluded IRPC which is better than Oil & Gas F12M Median, ‘Selected Peer F12M Median’ for EV/EBITDA is 5.71 times (while based on my calculation, Forward EV/EBITDA ratio of IRPC came out as 7.95 times).

Forward looking in term of Enterprise Value by the end of 2019, would yield 62,096 Million Baht, and 104,621 Million Baht for the end of 2020. As real Enterprise Value was 164,047 million Baht as dated 13 Dec 2019, this forecast assumed way too much difference. Thus, in my humble opinion, this relative valuation should be not be good relative valuation indicator.

Also, it should note that beyond year 2021, the Forward EV/EBITDA ratio become very unreliable to predict further than that, thus the focus should be the year 2019 and year 2020 only.

*\*Note: please reference calculation on Tab “PL PROFORMA RV” in the sheet*



## 1.7 Investment Risk & Downside Possibilities

In term of Risk, as Refinery Petroleum and Petrochemical company, IRPC company is quite exposure to many risks, both internal factors and external factors. From our research, we concluded into 5 main topics of investment risk & downside possibilities:

### 1. Market Risk

Oil price volatile / pressure from trade war / Thai baht appreciation effect on export revenue / Shale Oil / IMO 2020 (International Maritime Organization) / New tech: EV Car

### 2. Strategic Risk

Risk from international investment in China/ Southeast Asia / threat from exchange rat volatile, fluctuation in investment value/ lack of knowledge of regulatory / Risk of new business (e-commerce)

### 3. Operational Risk

New change of Company President, No incentive of driving company performance (0% share procession)

### 4. External Risk from Company's Assets & Business

Operations can become unpredictable and uncontrollable led to external risk factors such as terrorism, natural disaster, or political issue. It would tick serious influence on company's properties & business operations.

### 5. Interest rate risk

Hedging, forward, and future contracts for crude price

Source: IRPC Annual Report 2018

## CHAPTER II DATA

**Table 2.1 IRPC Forecast Balance Sheet**

Forecasted of Balance sheet	2018	2019F	2020	2021	2022	2023	2024
Cash and Short Term Investments	2,338	3,071	3,071	3,071	3,071	3,071	3,071
Total Receivables, Net	14,914	10,134	11,886	11,531	12,255	12,158	12,479
Total Inventory	28,459	21,679	23,792	23,812	24,913	24,905	25,465
Prepaid Expenses	241	300	300	300	300	300	300
Other Current Assets, Total	678	928	928	928	928	928	928
Total Current Assets	46,629	36,112	39,977	39,643	41,467	41,361	42,243
Property/Plant/Equipment	124,737	120,648	133,226	137,921	134,506	134,506	134,506
Long Term Investments	9,669	10,305	10,305	10,305	10,305	10,305	10,305
Other Long Term Assets, Total	865	1,417	1,417	1,417	1,417	1,417	1,417
Total Assets	182,446	168,482	184,925	189,286	187,695	187,590	188,472
<b>Liabilities (THB Millions)</b>							
Accounts Payable	26,212	19,047	21,477	21,221	22,345	22,268	22,805
Accrued Expenses	2,316	1,420	6,476	6,629	6,573	6,569	6,600
Notes Payable/Short Term Debt	6,700	5,900	5,900	5,900	5,900	5,900	5,900
Current Port. of LT Debt/Capital Leases	7,104	5,543	5,543	5,543	5,543	5,543	5,543
Other Current liabilities, Total	6,564	6,155	6,155	6,155	6,155	6,155	6,155
Total Current Liabilities	48,896	38,064	45,550	45,448	46,516	46,435	47,003
Total Long Term Debt	43,561	44,131	55,455	56,893	56,368	56,334	56,625
Total Debt	57,365	55,574	60,998	62,436	61,911	61,877	62,168
Deferred Income Tax	--						
Minority Interest	94	146	146	146	146	146	146
Other Liabilities, Total	2,609	3,594	3,945	4,038	4,004	4,002	4,020
Total Liabilities	95,160	85,935	105,096	106,525	107,034	106,917	107,794
Total Equity	87,286	82,547	79,829	82,761	80,661	80,673	80,678
Total Liabilities & Shareholders' Equity	182,446	168,482	184,925	189,286	187,695	187,590	188,472

Source: IRPC Audited financial statement 2018 and own calculation

**Table 2.2 Assumption on Sales of petroleum and petrochemical products**

	9M 2019	12M 2019F	2018	2017		9M 2019	12M 2019	2018	2017
Crude intake					Utility rate				
Million barrels	54.48	73.57	76.05	65.54	Olefins	96%	96%	94%	87%
KBD	193	208	208	180	Aromatics and Stryni	92%	96%	101%	90%
Utility rate					Sales Volume (Million Barrel)				
Refinery	93%	97%	97%	84%	Olefins	851	1,129	1,107	952
RDCC (Residue Deep Catalytic Cracking)	99%	99%	99%	80%	Aromatics and Stryni	534	706	728	631
Lube base oil	82%	82%	85%	76%	Sales value (Million Baht)				
Sales Volume (Million Barrel)					Olefins	29,395	40,210	43,980	35,044
Refinery	43.95	59.39	60.83	52.39	Aromatics and Stryni	16,834	23,494	28,760	24,684
Lube base oil	5.20	6.94	7.01	6.43	percentage				
Sales value (Million Baht)	117,435	163,340	182,953	135,125	Olefins	64%	63%	60%	59%
Refinery	104,477	145,401	163,724	119,015	Aromatics and Stryni	36%	37%	40%	41%
Lube base oil	12,958	17,939	19,229	16,110	price per barrel				
					Olefins	34.54	35.62	39.73	36.81
					Aromatics and Stryni	31.52	33.28	39.51	39.12

Source: MD&A reports of year 2017 – Q3 2019 and own calculation



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