



# Conference call with Maybank Kim Eng's clients

15 April 2020



## Forward-looking Information

The information, statements, forecasts and projections contained herein reflect the Company's current views with respect to future events and financial performance. These views are based on assumptions subject to various risks. No assurance is given that these future events will occur, or that the Company's assumptions are correct. Actual results may differ materially from those projected.

## Petroleum Reserves Information

In this presentation, the Company discloses petroleum reserves that are not included in the Securities Exchange and Commission of Thailand (SEC) Annual Registration Statement Form 56-1 under "Supplemental Information on Petroleum Exploration and Production Activities". The reserves data contained in this presentation reflects the Company's best estimates of its reserves. While the Company periodically obtains an independent audit of a portion of its proved reserves, no independent qualified reserves evaluator or auditor was involved in the preparation of reserves data disclosed in this presentation. Unless stated otherwise, reserves are stated at the Company's gross basis.

This presentation may contain the terms "proved reserves" and "probable reserves". Unless stated otherwise, the Company adopts similar description as defined by the Society of Petroleum Engineers.

**Proved Reserves** - Proved reserves are defined as those quantities of petroleum which, by analysis of geological and engineering data, can be estimated with reasonable certainty to be commercially recoverable, from a given date forward, from known reservoirs and under current economic conditions, operating methods, and government regulations.

**Probable Reserves** - Probable reserves are defined as those unproved reserves which analysis of geological and engineering data suggests are more likely than not to be recoverable.

## Corporate

- Implement Work From Home Policy
- Evacuate personnel working overseas back to Thailand
- Utilize digital technology in secured platform
- Thoroughly screen all contractors and visitors
- Monitor daily body temperature before entering premises



## Stakeholders

- Support front line organizations to fight with COVID-19, in total value of 30 Million baht
- PTTEP with ARV (subsidiary of PTTEP) and partner developed and delivered “Negative pressure patient transfer bed” and “Mobile negative pressure box” to ensure safety of medical personnel, to hospitals nationwide

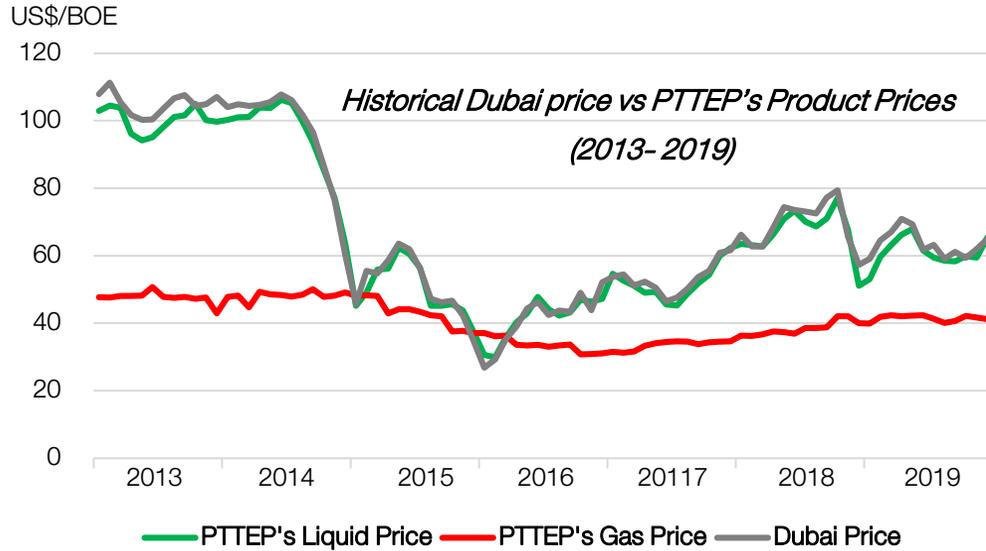
## Operation sites



- Maintain production levels
- Postpone non-critical activities
- 14-day quarantine for all staffs and contractors before entering production sites
- Daily monitoring & heighten control measures at sites
- Strictly adhere to health & safety directions of local regulators (domestic & overseas) of each operating site

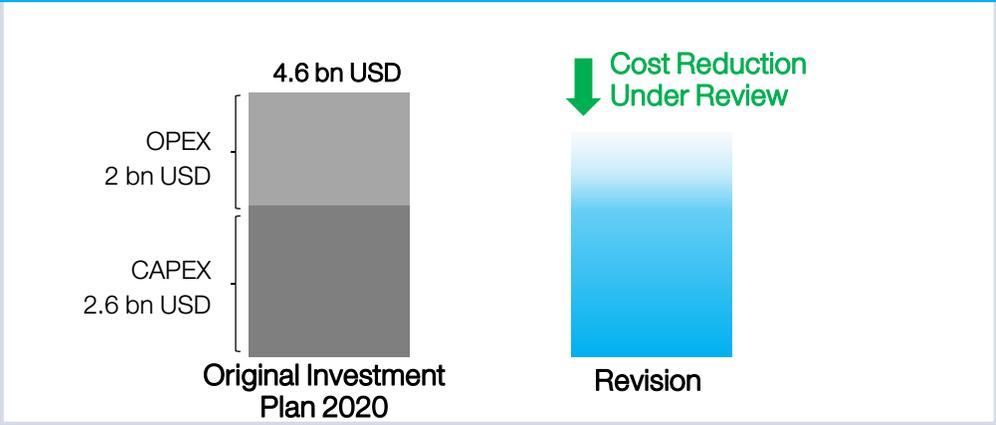


## PTTEP's Gas price : resilient to oil price movement



- **Price : No drastic impact** to Average Selling Price in 2020
  - Gas : 70%, with resilient prices from time lagging adjustment
  - Liquid : 30%, with 40% oil price hedged
- **Volume : Committed volume** based on long-term gas sales agreement
- **Cost : Low Cost Structure** with cash cost around 16 \$/BOE
- **Liquidity : Strong** Balance Sheet with cash on hand at 3 bn\$, low debt to equity of 0.29x, and no upcoming debt repayment scheduled in 2020 and 2021

## Investment Plan Revision



- **Revisit Investment Plan:** Prioritize CAPEX and OPEX while maintaining production volume as planned by;
  - Continuing maintenance CAPEX & OPEX
  - Prioritizing exploration drilling and defer some activities
  - Reducing non-operation related expenses

# 2019 Highlights



# Strategy and Growth



# Financial Performance



# 2019 KEY ACHIEVEMENTS



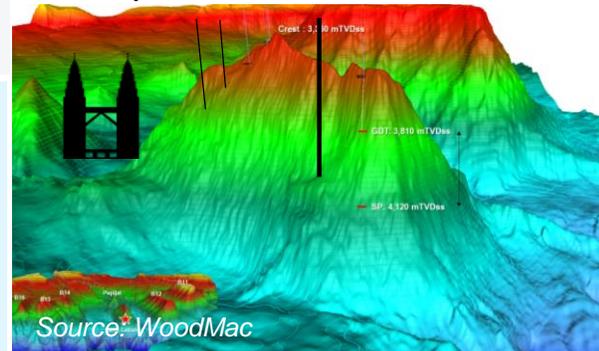
**351 KBOED**  
 “PTTEP records the highest sales volume of all time at 351 KBOED in 2019”

**WORLD'S 7<sup>th</sup>**  
 Largest gas discovery in 2019 from Lang Lebah well, Project SK410B offshore Sarawak, Malaysia

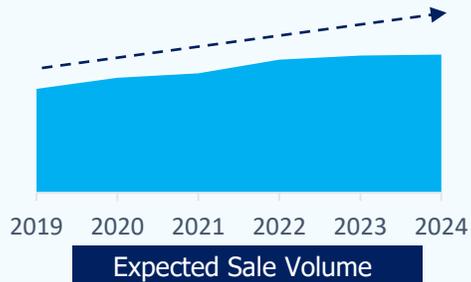
**1,569 MM\$**  
**71% EBITDA Margin**



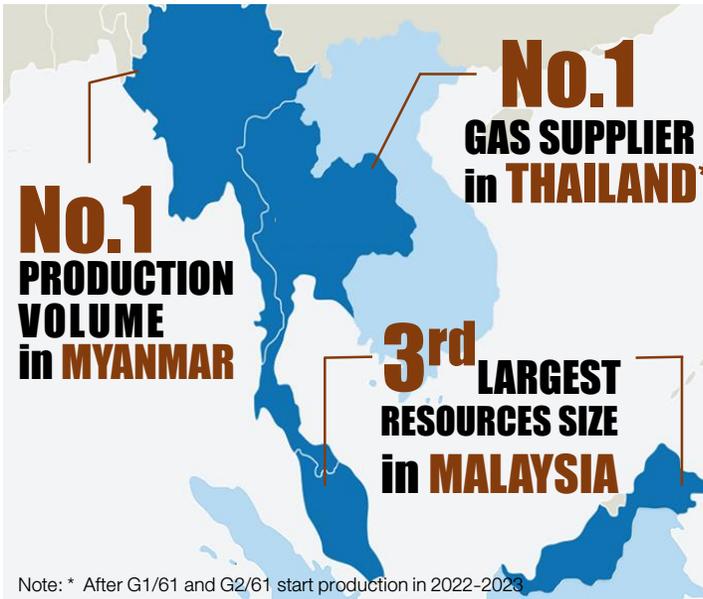
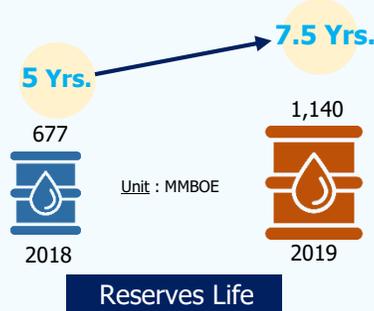
PTTEP reported net income of 1,569 MMUSD, an increase of 40% compared to the previous year, with healthy EBITDA margin of 71%.



**6% CAGR**

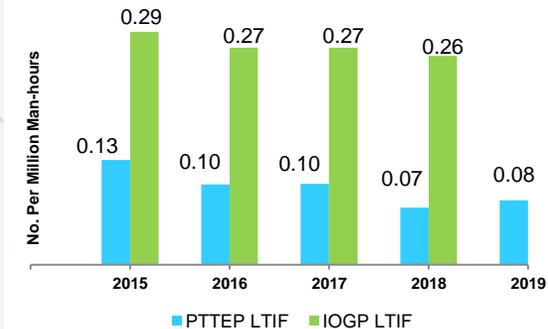


**7.5 R/P**



**Safety Target ZERO**

Below Industry Standard



LTIF: Lost Time Injury Frequency  
 IOGP: International Association of Oil & Gas Producers

**3 Awards**

- Bongkot & Erawan
- Offshore exploration blocks in the United Arab Emirates
- Exploration blocks in offshore Peninsular Malaysia

**3 M&As**

- Murphy assets in Malaysia
- Partex with major investment in Middle East
- Additional interests in Sinphuhorm Project

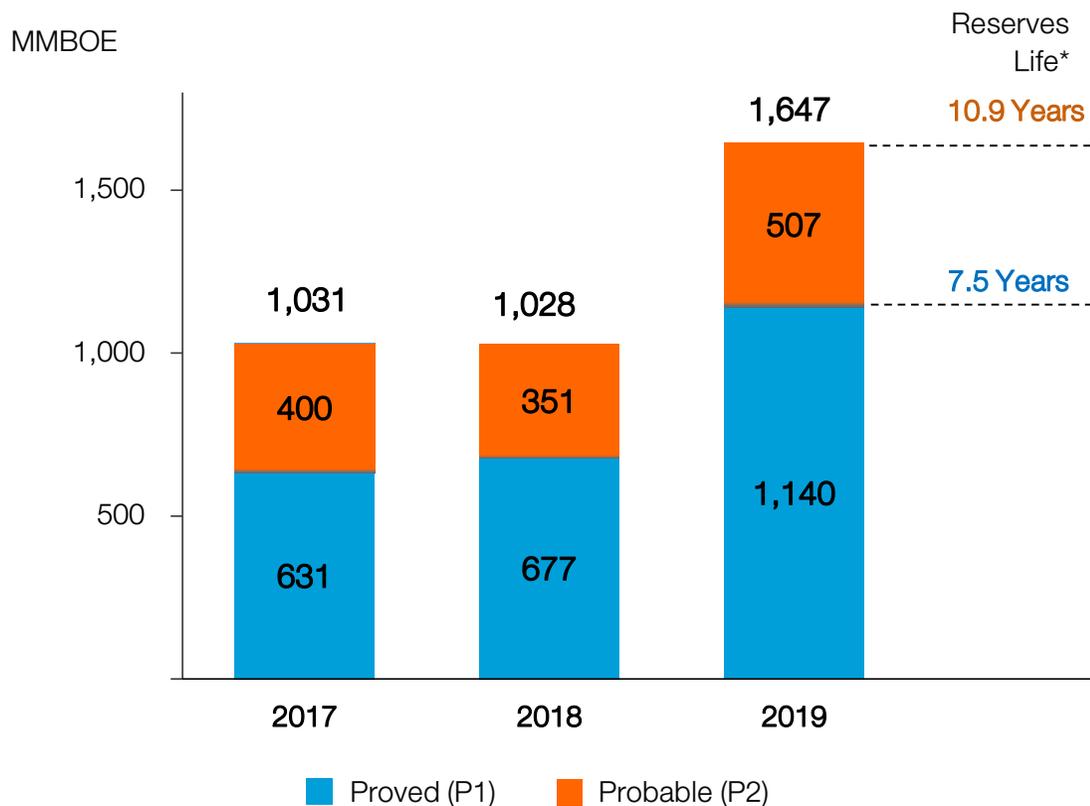
**2 FIDs**

- Mozambique Area 1 Project
- Algeria Hassi Bir Rekaiz Project

Note: FID: Final Investment Decision  
 R/P: Proved Reserves / Production

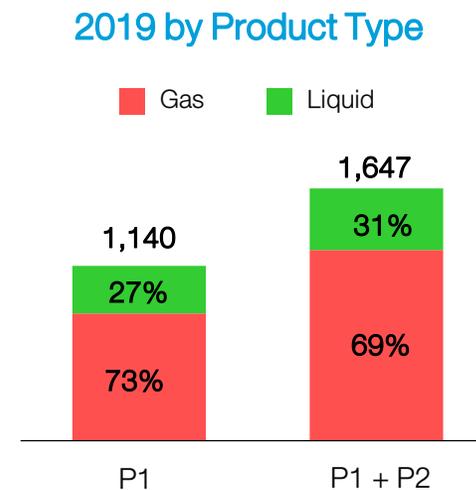
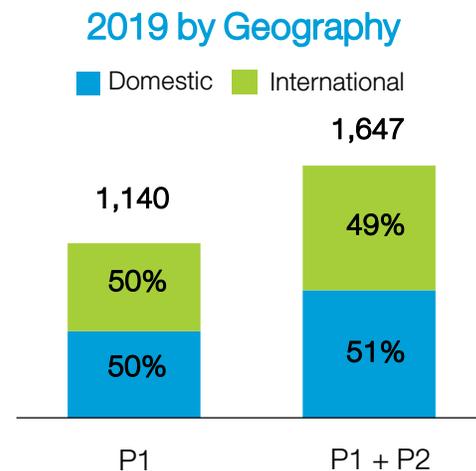
# Reserves at the Year-end 2019

Significantly improved reserve life to over 7 years



5-Year Average Proved Reserves Replacement Ratio (RRR)

Year	2017	2018	2019
RRR	0.58x	0.74x	1.53X



- Based on total production of natural gas, condensate, and crude oil (including LPG) of 414 KBOED for the year ended December 31, 2019
- Figures include reserves from equity method

## 2019 Highlights



## Strategy and Growth

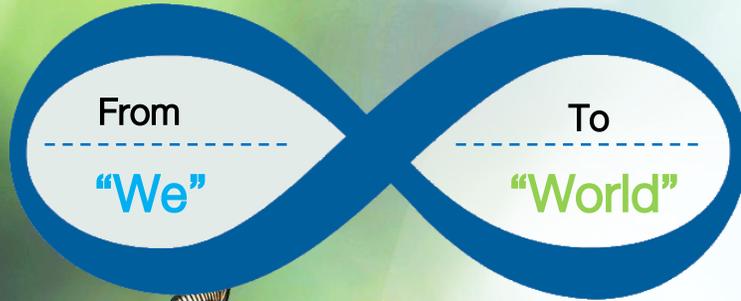


## Financial Performance

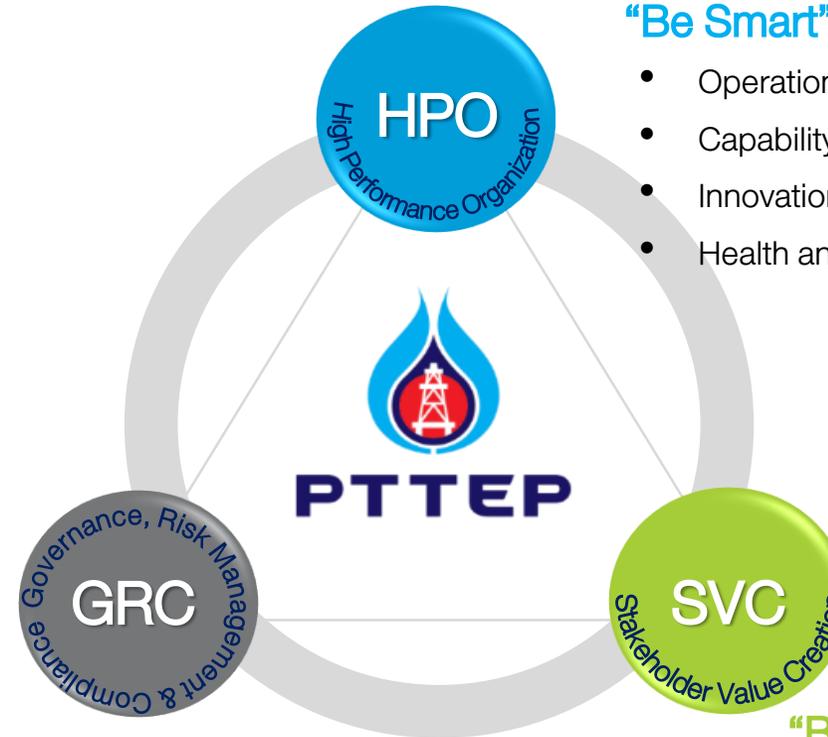


## “Energy Partner of Choice”

through competitive performance and innovation  
for long-term value creation



Note: \*Greenhouse Gas



### “Be Smart”

- Operational Excellence
- Capability Development
- Innovation and Technology
- Health and Safety

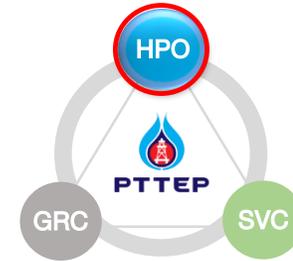
### “Be Good”

- Conducting business with accuracy, transparency, fairness
- Strict compliance with laws and regulations
- Good governance and appropriate risk management

### “Be responsible”

- GHG\* Reduction
- Contribution to Society
- Environmental Management

# HPO: Together Driving the Organization with “Execute” and “Expand”



## Smooth Business Transition & Production Continuity

### *G1/61 and G2/61 :*

Deliver production volume as committed, 2022-2023 onwards

### *Newly Acquired Assets in Malaysia :*

Maximize sales volume and ensure 1<sup>st</sup> gas for Block H in 2020

### *Newly Acquired Assets from Partex:*

Maintain sales volume



### *Sustain plateau on legacy assets*

Applying advanced technology e.g. new Enhanced Oil Recovery (EOR) technique in S1

### *Monetize development projects*

Mozambique Area 1 and Algeria HBR

## Acceleration of Exploration Activities

### *Malaysia*

Develop clusters with operational synergy and accelerate time to market for SK410B

### *Myanmar*

Prove up gas potential in MD-7



### *‘Coming Home Strategy’*

Focus in South East Asia

### *‘Strategic Alliance in Middle East’*

Partner with experienced operators

## Full Value Creation on Existing Assets

## Expand in Strategic Areas

### Achievement Targets:

- 5% Average Production Growth
- ≥7 Years of Proved Reserves Life
- Competitive Unit Cost
- 80% gas oriented portfolio
- Safety Target Zero



## GHG\* Reduction

Growing business, while decreasing GHGs emission





Flare Gas Utilization    Energy Efficiency    Smart Logistics




Leakage Prevention    Reforestation



## Circular Model for E&P

Maximize resource efficiency and zero waste to landfill




New Design of reusable WHP and Well Pad    Topside Reuse





Facility Reuse    Part/ Inventory Refurbished    Drill Cuttings Reuse in Road Construction



## Ocean for Life

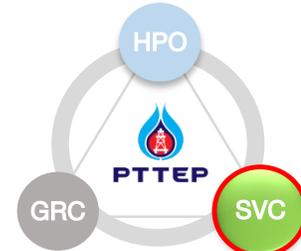
Improve biodiversity and local wealth




Zero Spill    Conservation & Restoration




Rig to Reef    Baseline : Micro-plastic



### Achievement Targets in 2030:



**25% GHG Intensity Reduction**  
from 2012 base year)



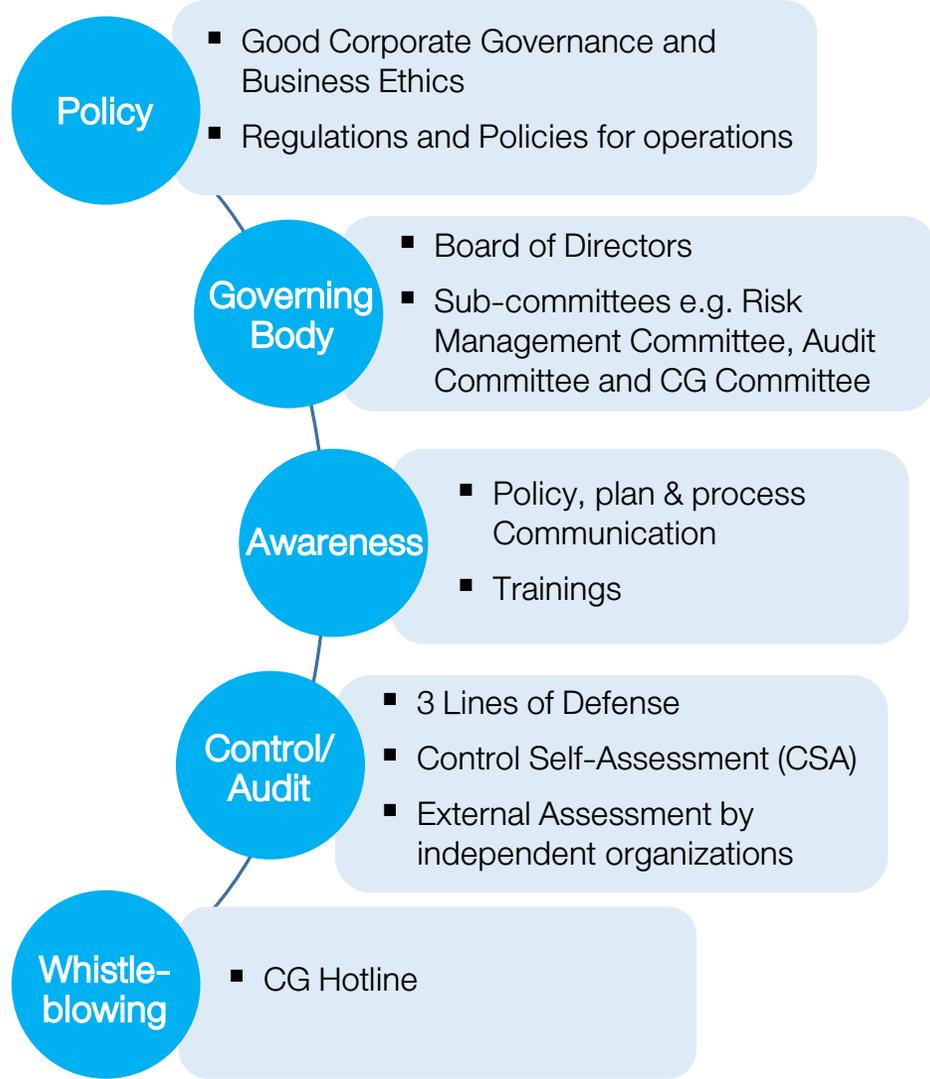
- 50% Reuse of Structure
- Zero Waste to Landfill



- Improve Positive Value to Biodiversity
- Improve Community Income

Note: GHG = Greenhouse Gas

## How do we ensure GRC?



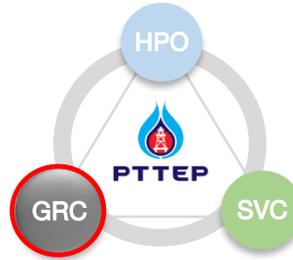
GRC Baseline Application to:



Global Operations & Newly acquired assets



Suppliers & Contractors



## STOP CORRUPTION Anti corruption



The NACC Integrity Award from National Anti-Corruption Commission (NACC)



## Human rights



The 2019 Role Model Organization Award on Human Rights from Ministry of Justices



## 2019 Highlights



## Strategy and Growth



## Financial Performance

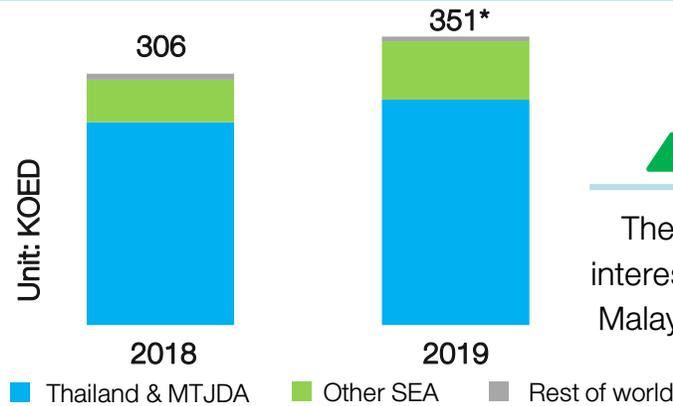


# 2019 Key Financial Performance

Strong core performance supported by higher volume and gas price



## Sale Volumes



**▲ 15% YTD**

The acquisition of 22% interest in Bongkot Project, Malaysia Asset and Partex

\* Include sales volume from ADNOC Gas Processing (AGP); a part of the acquisition of Partex which was completed in November 2019



## Average Selling Price

	2018	2019
Gas (\$/MMBTU)	6.42	6.92
Liquid (\$/BBL)	67.40	61.18
Weighted Avg. (\$/BOE)	46.66	47.24
Avg. Dubai (\$/BBL)	69.65	63.51
Volume Mix (Gas : Liquid)	72:28	71:29

**▲ 1% YTD**

Strong gas price leading to higher average selling price

### Key Financial Performance

Unit : \$/BOE	2018	2019
Cash cost	15.11	15.88
Non-Cash cost	16.58	15.83
Unit cost	31.69	31.71

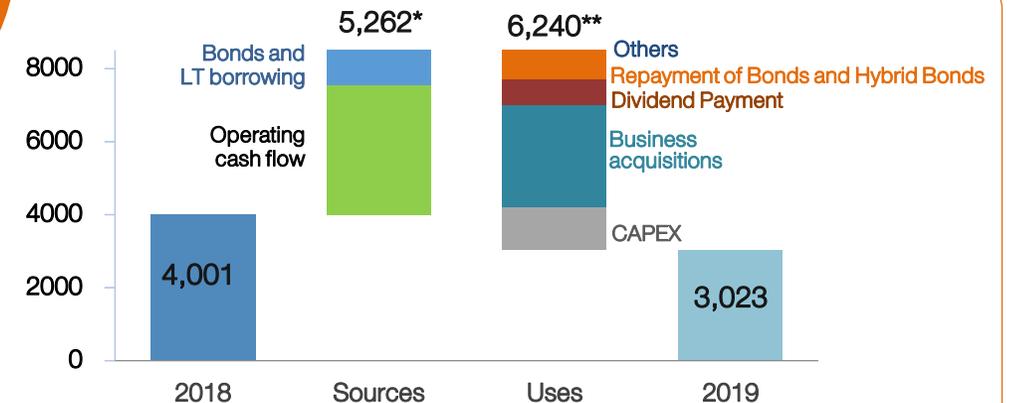
**Unchanged**

Remain competitive unit cost

Note: Unit Cost : Exclude costs related to new business



## Unit Cost

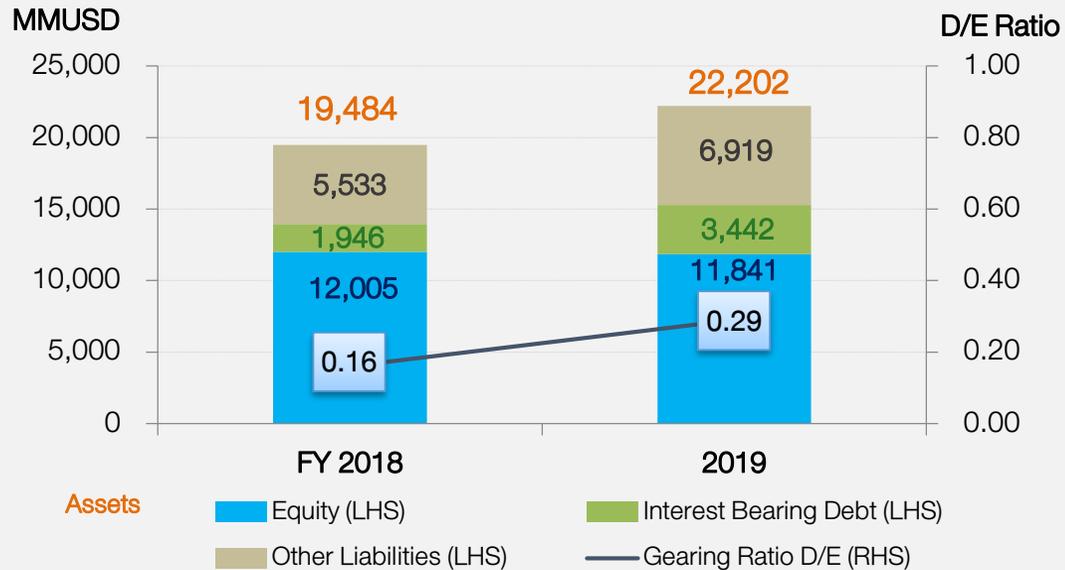


## 2019 Source & Use of Funds

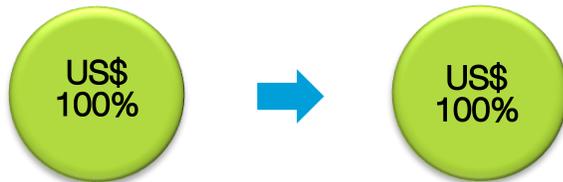
Remark: \* Net of adjustment for the effect of exchange rate changes on cash and cash equivalents  
 \*\* Excludes cash flows for investing in short-term investments (Fixed deposit > 3 months)

## Capital Structure

Healthy balance sheet at competitive leverage level



### Debt Profile



Weighted Average Cost of Debt (%)	5.32	4.41
[Fixed : Floating]	[100 : 0]	[82 : 18]
Average Loan Life (Years)	8.67	13.84

Remark: Debt profile excludes Hybrid bonds

## Dividend Payment History

Policy : No Less Than 30% of Net Income



Payout Ratio (% of net income)	N/A	98	90	55	49
Payout Ratio (% of recurring net income)	47	79	64	51	53

*XD Date* 13 February 2020  
*Record date* 14 February 2020  
*Payment Date* 10 April 2020

## 2020 Guidance

*Continue volume growth base with operational efficiency*

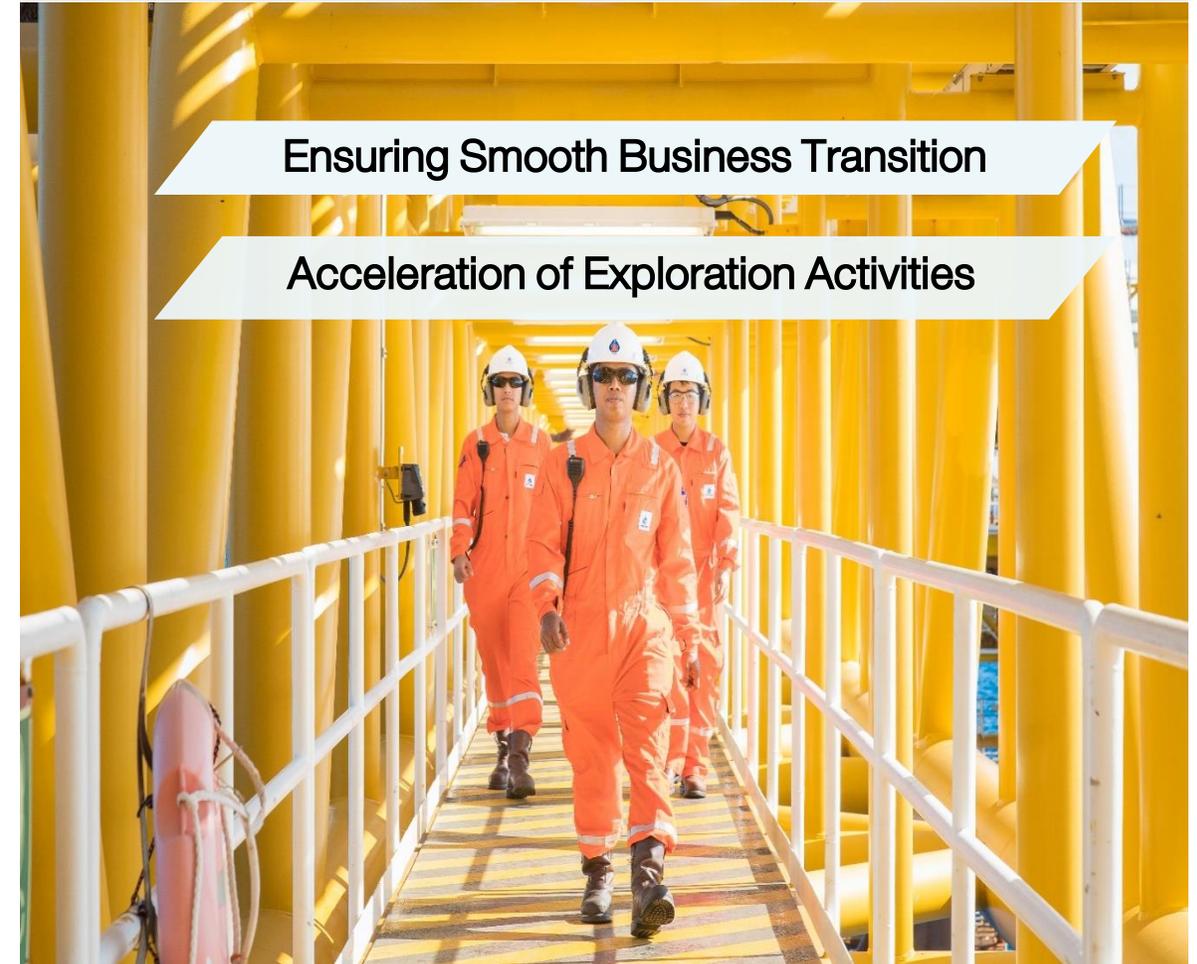
	Q1 2020	FY 2020
 <b>Average Sales Volume*</b> <small>KBOED</small>	~ 394	~ 391
 <b>Average Gas Price</b> <small>USD/MMBTU</small>	~ 6.8	~ 6.4
 <b>Unit Cost</b> <small>USD/BOE</small>	~ 32	~ 32
 <b>EBITDA Margin</b> <small>% of sales revenues</small>	70-75 %	

Note:

\* Include sales volume from ADNOC Gas Processing (AGP); a part of the acquisition of Partex which was completed in November 2019

Based on average Dubai oil price in FY2020 at 60 \$/BBL and HSFO-Dubai spread in 2020 around 13 \$/BBL

## PTTEP's Priorities



**Ensuring Smooth Business Transition**

**Acceleration of Exploration Activities**



# Thank you and Q&A

You can reach the Investor Relations team for more information and inquiry through the following channels

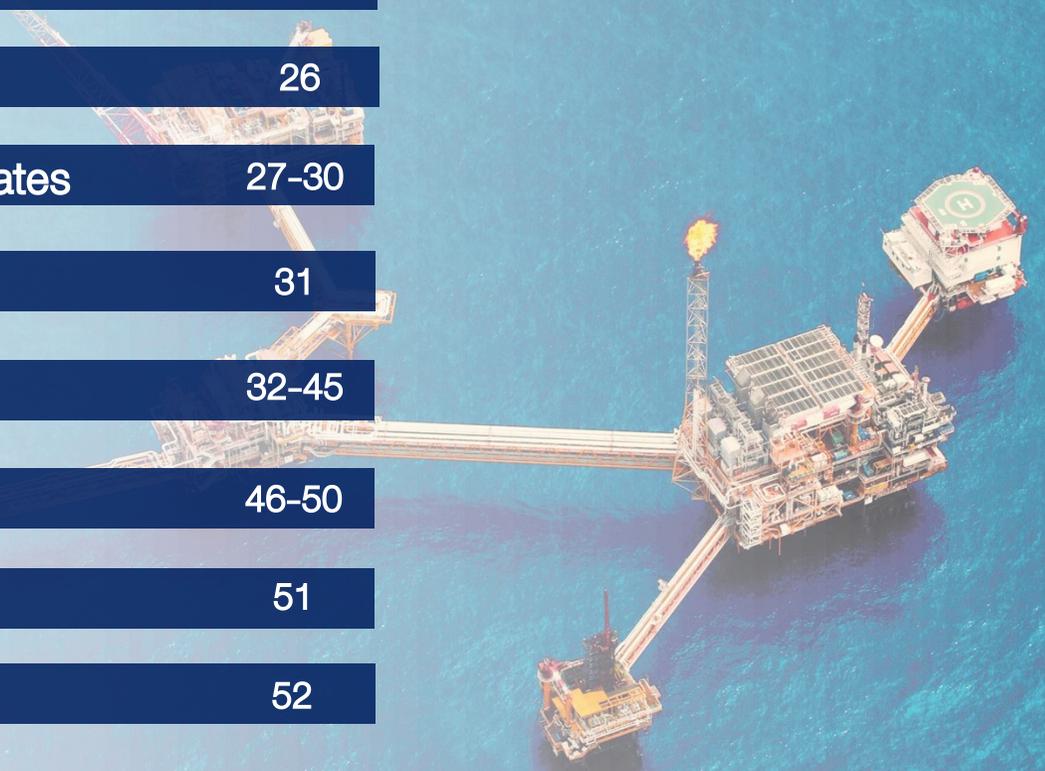


[IR@pttep.com](mailto:IR@pttep.com)



## Supplementary information

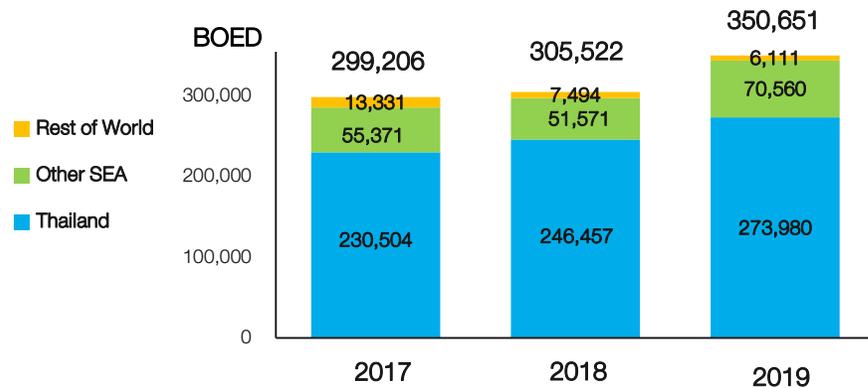
● 2019 Financial Results	19-24
● 5-year Investment Plan	25
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● Key Project Highlights by Region	32-45
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# Sales Volume & Unit Cost

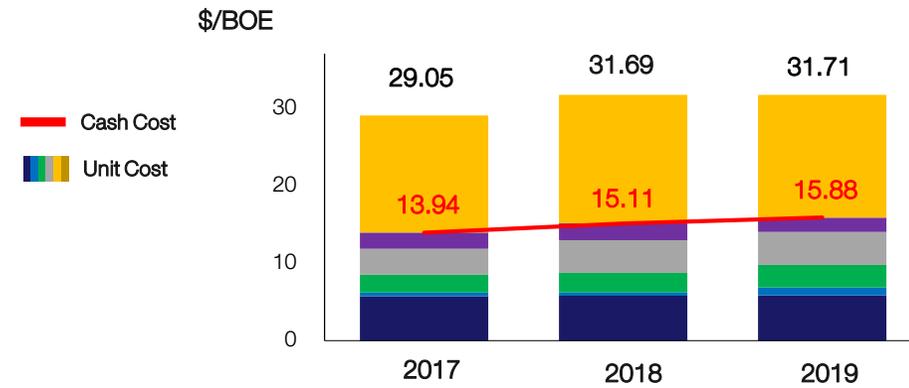
Upward sales volume after completion of acquisitions with competitive cost

## Sales Volume and Price



Gas (\$/MMBTU)	5.59	6.42	6.92
Liquid (\$/BBL)	52.26	67.40	61.18
<b>Weighted Avg. (\$/BOE)</b>	<b>39.20</b>	<b>46.66</b>	<b>47.24</b>
Avg. Dubai (\$/BBL)	53.14	69.65	63.51
Avg. HSFO (\$/BBL) (High Sulphur Fuel Oil)	49.64	67.01	58.60
<b>Volume Mix (Gas : Liquid)</b>	<b>70 : 30</b>	<b>72 : 28</b>	<b>71 : 29</b>
<b>Revenue Mix (Gas : Liquid)</b>	<b>60 : 40</b>	<b>59 : 41</b>	<b>62 : 38</b>

## Unit Cost

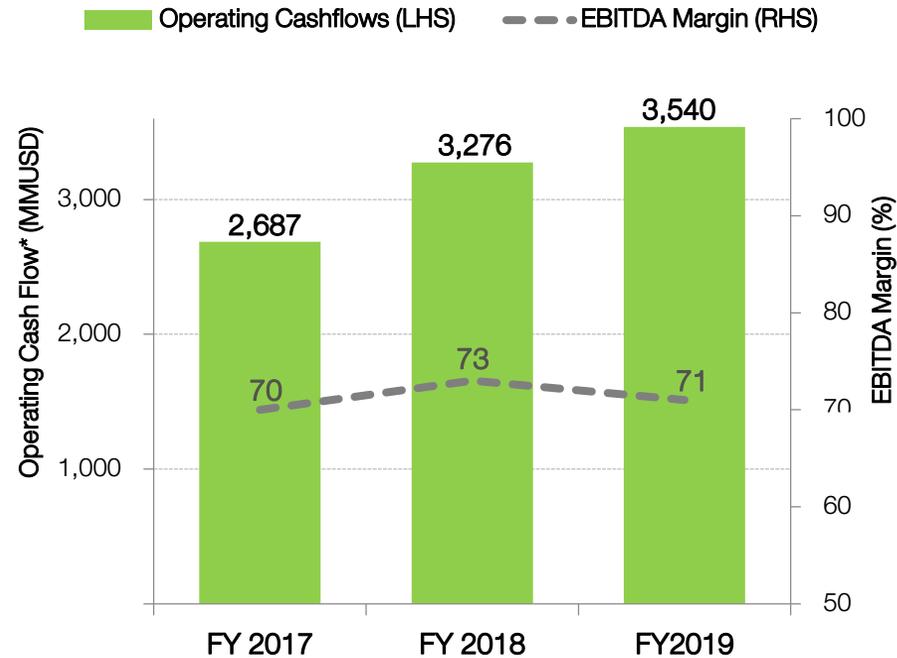


DD&A	15.11	16.58	15.83
Finance Cost	2.07	2.14	1.84
Royalties	3.37	4.21	4.27
G&A	2.30	2.57	2.91
Exploration Expenses	0.48	0.41	1.00
Operating Expenses	5.72	5.78	5.86
<b>Lifting Cost</b>	<b>4.19</b>	<b>4.33</b>	<b>4.31</b>

Note: \* Exclude costs related to new business

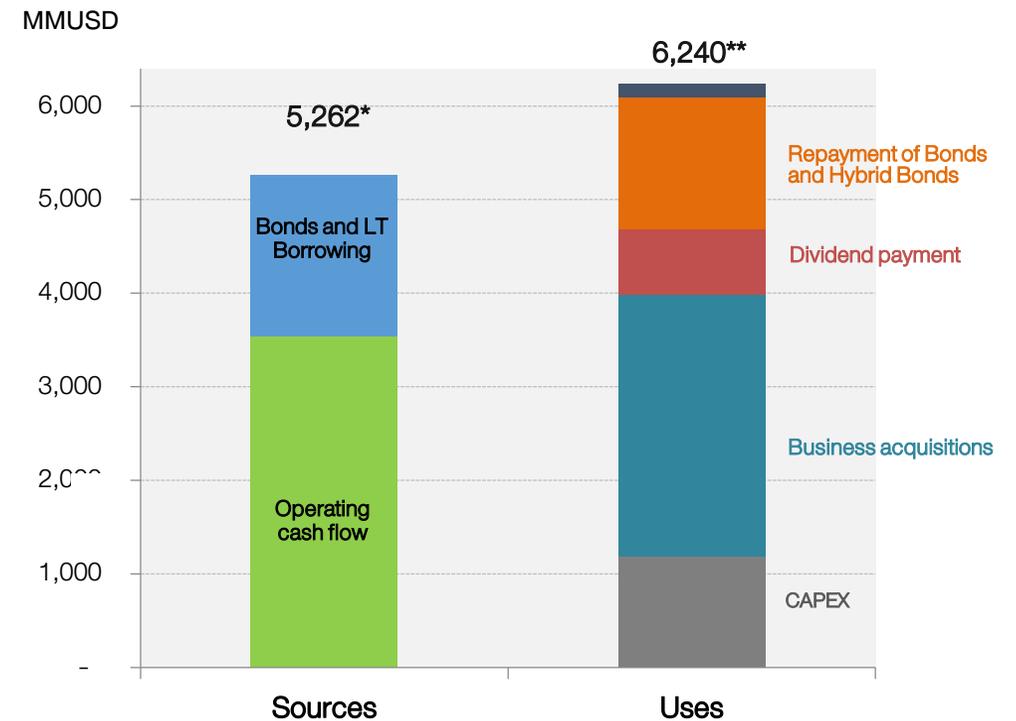
The formulas for calculating ratios are provided in the supplementary section for your reference

## Cash Flow Performance



Net Income	594	1,120	<b>1,569</b>
Recurring Net Income***	836	1,215	<b>1,445</b>

## Source & Use of Funds in 2019



Remark: \* Net of adjustment for the effect of exchange rate changes on cash and cash equivalents

\*\* Excludes cash flows for investing in short-term investments (Fixed deposit > 3 months)

\*\*\* Excludes Gain/(Loss) on FX, Deferred tax from Functional currency, Current Tax from FX Revaluation, Gain/(Loss) from Financial Instruments, Impairment Loss on Assets, and etc.

# Financial Performance : Income Statement

*Sustained solid EBITDA*

	2019	2018	Q3 19	Q4 19	Q4 18
Sales and Revenue from Pipeline Transportation (MMUSD)	6,163	5,310	1,524	1,780	1,440
EBITDA (MMUSD)	4,354	3,860	1,054	1,188	1,024
Net Income (MMUSD)	1,569	1,120	358	384	269
Recurring Net Income (MMUSD)	1,445	1,215	303	379	283
Earning Per Share (USD)	0.38	0.27	0.09	0.09	0.07
<b>Key Financial Ratios</b>					
EBITDA Margin (%)	71	73	69	67	71
Return on Equity (%) (LTM)	13	10	12	13	10
Return on Capital Employed (%) (LTM)	11	9	11	11	9
Return on Equity (%) (LTM, Recurring Net Income)	12	10	11	12	10
Return on Capital Employed (%) (LTM, Recurring Net Income)	11	9	10	11	9

Note: The formulas for calculating ratios are provided in the supplementary section for your reference

# Financial Performance : Balance Sheet

*Healthy balance sheet at competitive leverage level*

	2019	2018
Total Assets (MMUSD)	22,202	19,484
- Cash & cash equivalents * (MMUSD)	3,023	4,001
Total Liabilities (MMUSD)	10,361	7,479
- Interest bearing debt (MMUSD)	3,442	1,946
Equity (MMUSD)	11,841	12,005
<b>Key Financial Ratios</b>		
Total Debt to Equity (X)	0.29	0.16
Net Debt** to Equity (X)	0.04	(0.17)
Total Debt to Capitalization (X)	0.23	0.14
Total Debt to EBITDA (X)	0.62	0.63
EBITDA Interest Coverage (X)	39	32

**Credit Ratings :**

BBB+ (S&P), Baa1 (Moody's), AAA (TRIS), BBB+ (FITCH)

**Weighted Average Cost of Debt \*\* :**

4.41%

**Average Loan Life \*\* :**

13.84 years

Note: \* Cash & Cash Equivalents (Cash on hand) include Short-term Investments (Fixed deposit > 3 months)

Net Debt = Total Debt less Cash & Cash Equivalents and Short-term Investments

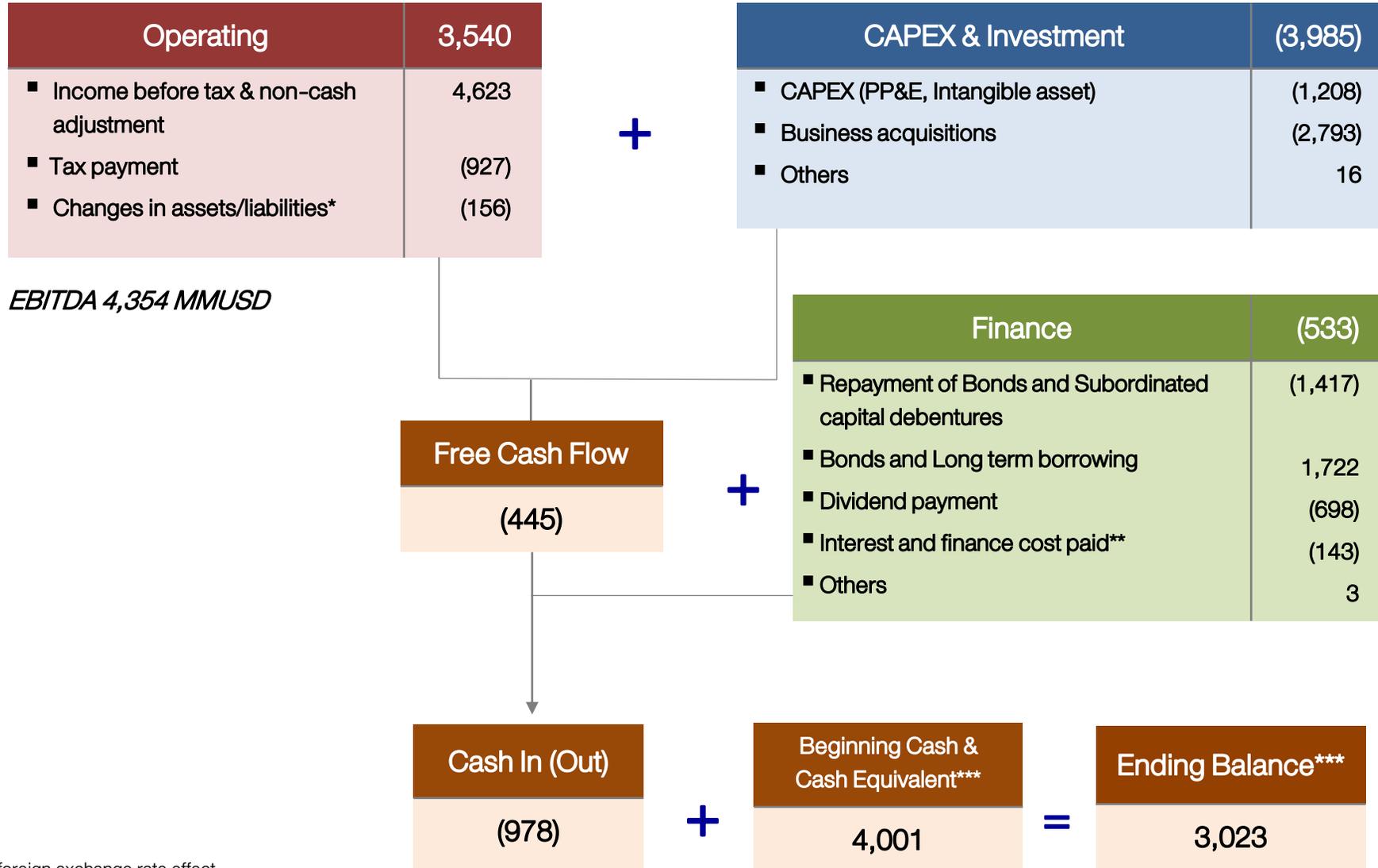
\*\* Excludes hybrid bonds

The formulas for calculating ratios are provided in the supplementary section for your reference

# Cash Flows : January – December 2019

Healthy operating cash flow

Unit : MMUSD



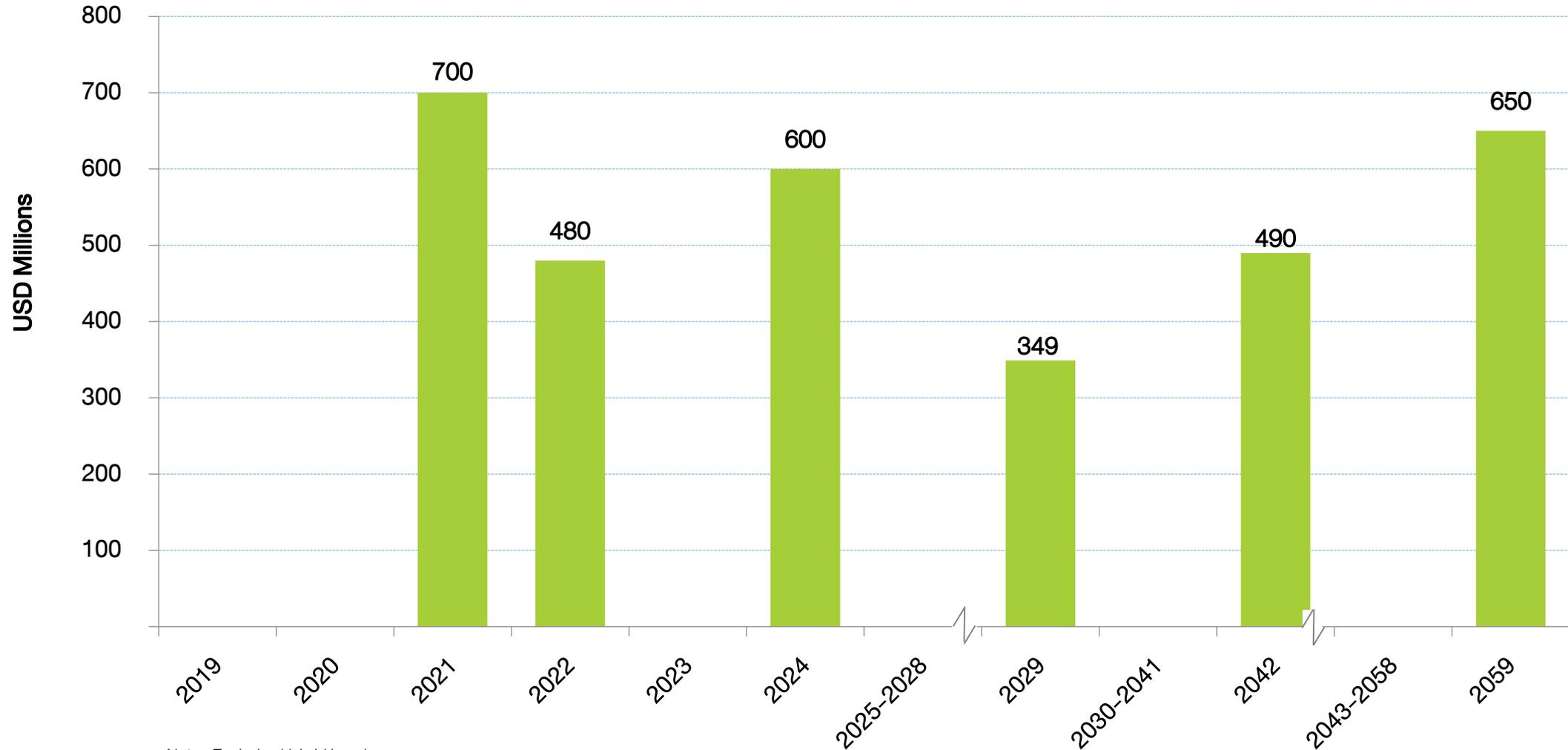
Note: \* Net of foreign exchange rate effect

\*\* Net of interest received

\*\*\* Include Short-term Investment (Fixed deposit > 3 months)

# Debt Maturity Profile

As of December 2019

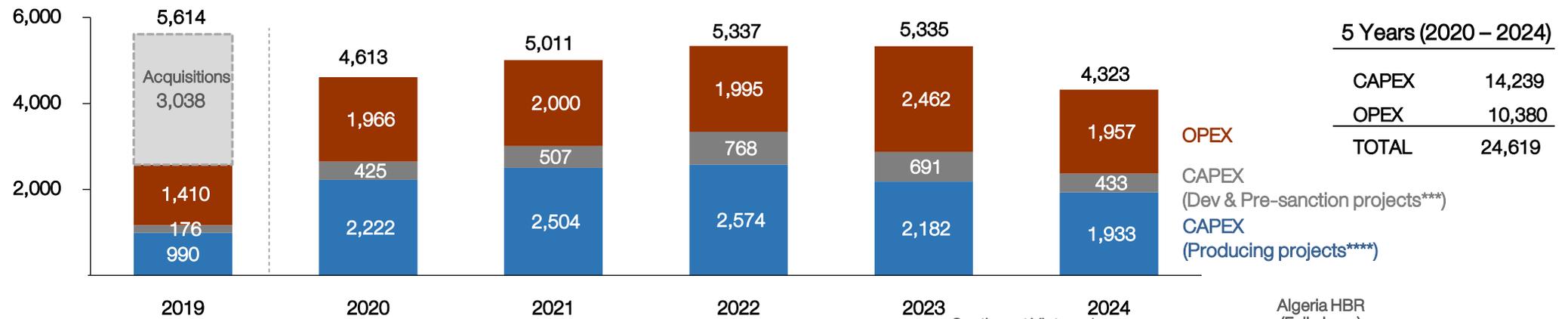
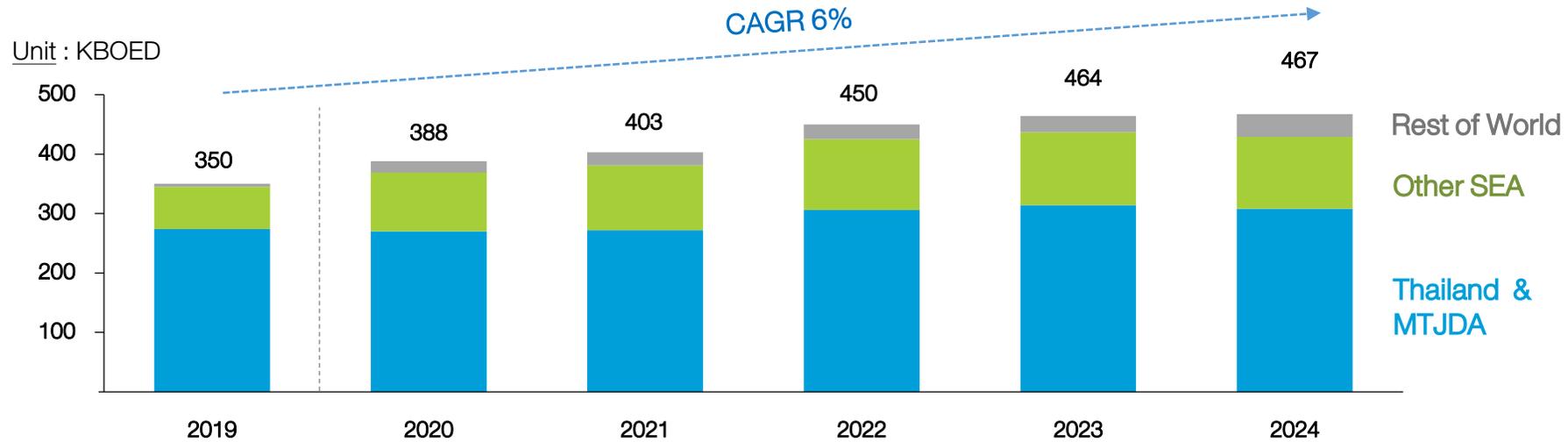


Note: Excludes Hybrid bonds

Unit: USD Millions or equivalent after cross currency swap

# Five –Year Plan

Support current operations, business transitions and drive development projects for near term volume additions



5 Years (2020 – 2024)

CAPEX	14,239
OPEX	10,380
<b>TOTAL</b>	<b>24,619</b>

Key Project Start-up



Note:

- \* Subject to FID timing
  - \*\* According to Production Sharing Contracts signed on 25 February 2019
  - \*\*\* Development & Pre-sanction projects include Mozambique LNG , Sabah H, Algeria HBR, SK410B and Southwest Vietnam
  - \*\*\*\* Includes exploration and appraisal in all projects and head office CAPEX
- Exclude sales volume from ADNOC Gas Processing (AGP); a part of the acquisition of Partex which was completed in November 2019

# Exploration Plan in 2020

Accelerate Exploration activities mainly in Malaysia

CAPEX  
281 MMUSD

2020 Budget

343  
MMUSD

OPEX  
62 MMUSD



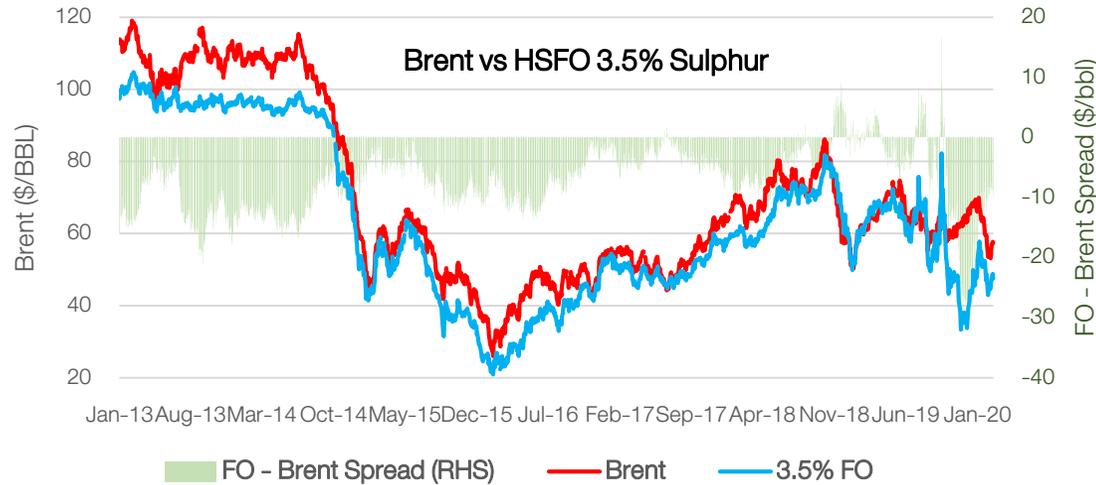
Note: Excludes exploration activities of certain producing and pre development assets

# Industry Trends: IMO2020 Implications

Minor impact to PTTEP's performance

## HSFO : Historical & Forward

Historically, HSFO-Brent Spread has been volatile

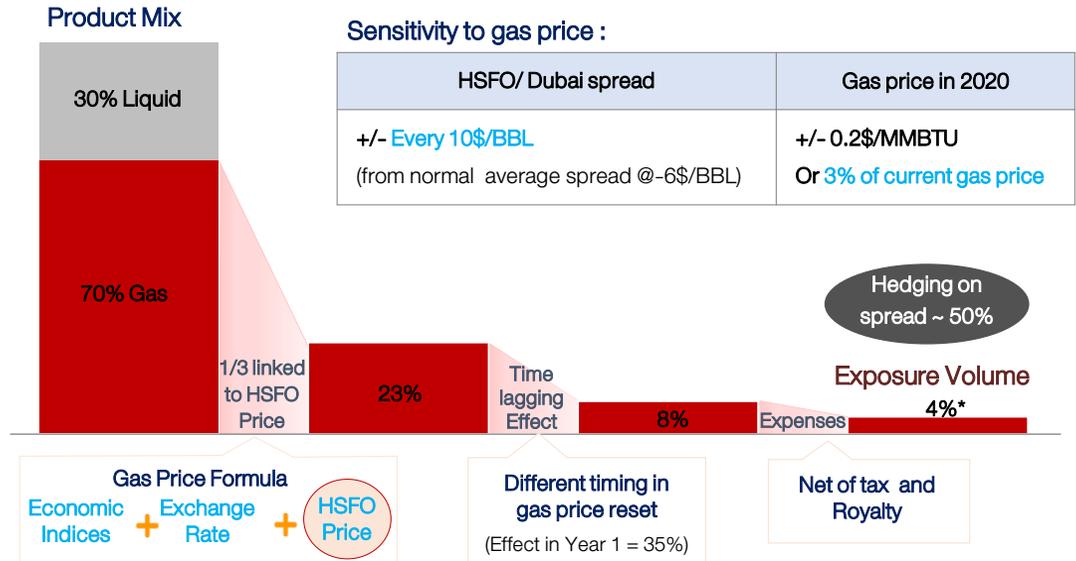


## Industry Rebalancing, expected within 1-2 years

Forward Prices for HSFO 3.5% Sulphur - Brent by Entry Period



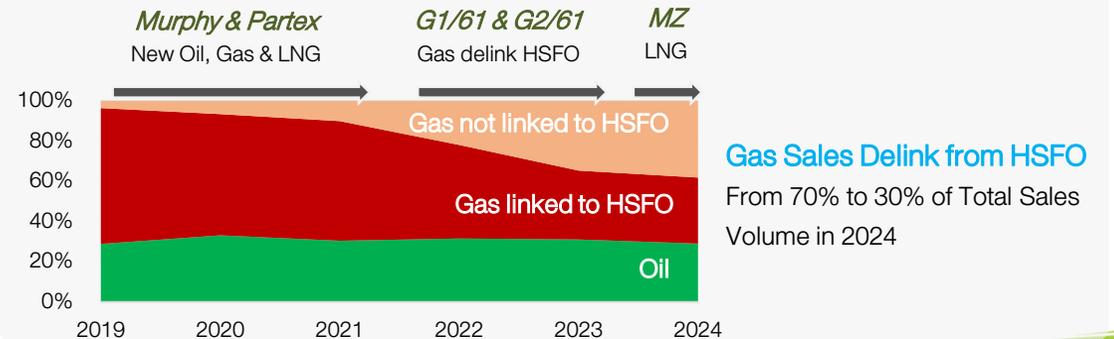
## Impact and Mitigations



Note: \*Exposure Volume in 2020 Only

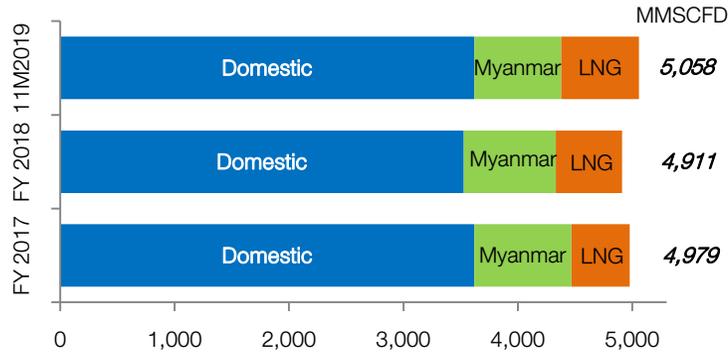
## Long term effect :

PTTEP's Gas/Liquid Sales Proportion Forecast



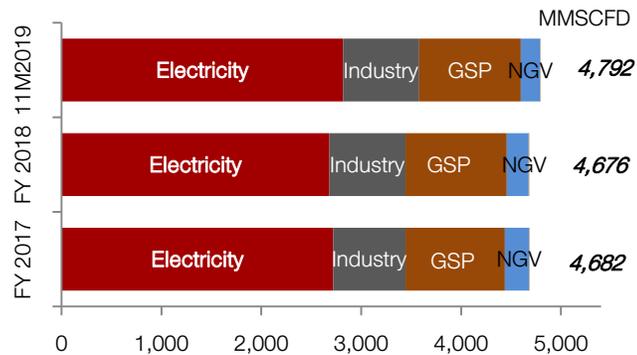
## Thailand Energy Overview

### Natural Gas Supply

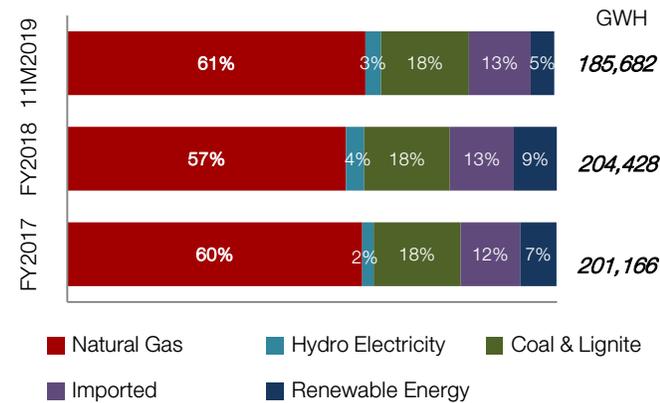


Slight decline from Myanmar piped gas imports due to natural decline and significant growth in LNG import

### Natural Gas Consumption

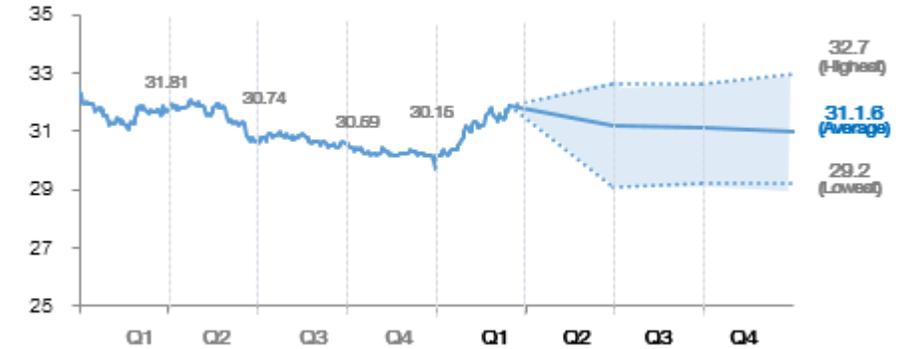


### Electricity Generation



Source: EPPO

## Exchange Rate Movement (THB/USD)



### Consensus on the exchange rate mostly depends on

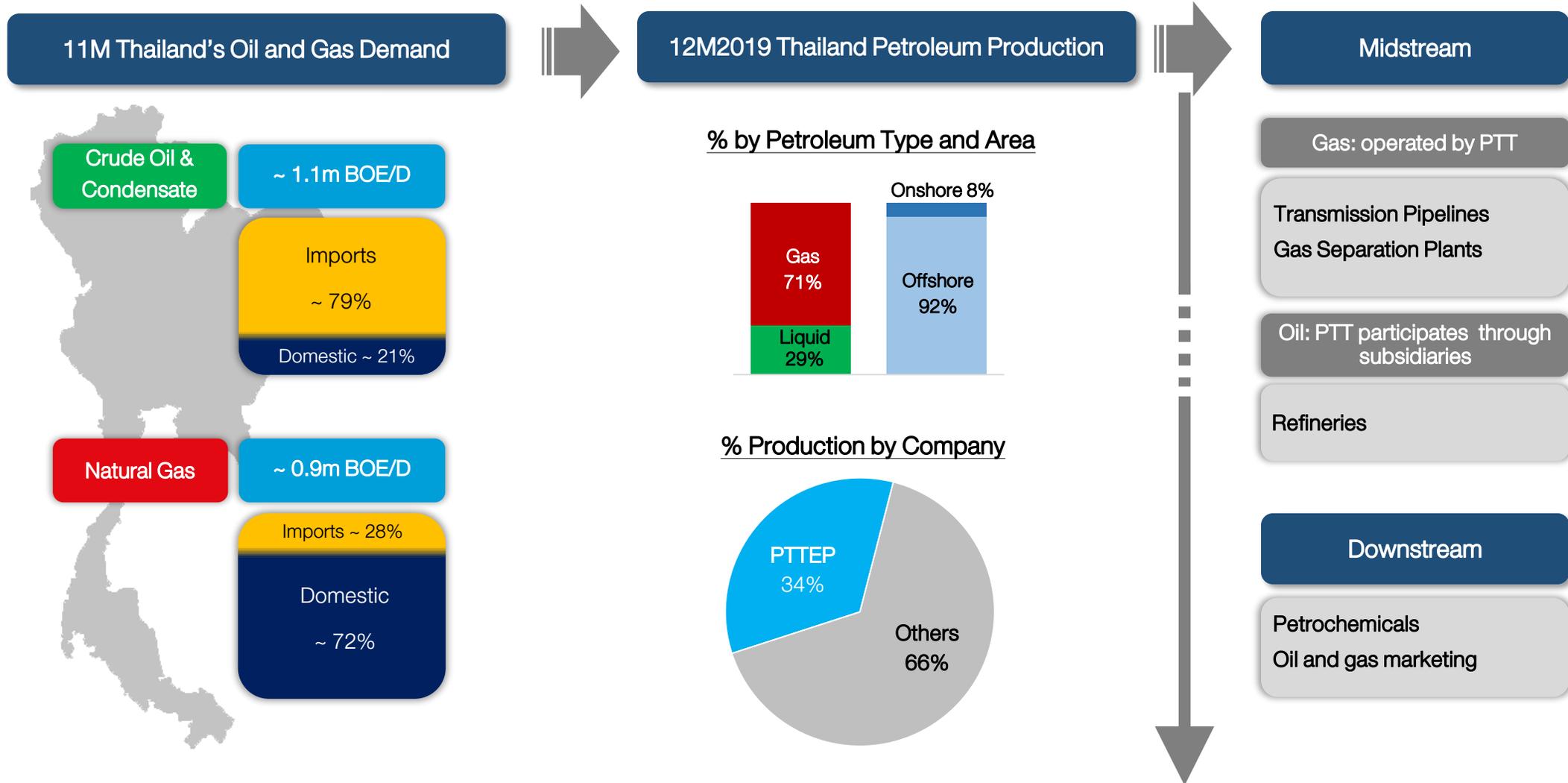
- BOT's direction on monetary policy
- Slow recovery in public spending and private investment
- US Federal Reserve monetary policy and election result
- Geopolitical tension; between US and the Middle East
- Trade war between the US and China

Source: Bank of Thailand, Bloomberg

Forecast based on Bloomberg Consensus as of 16 March 2020

# Thailand's Energy Value Chain

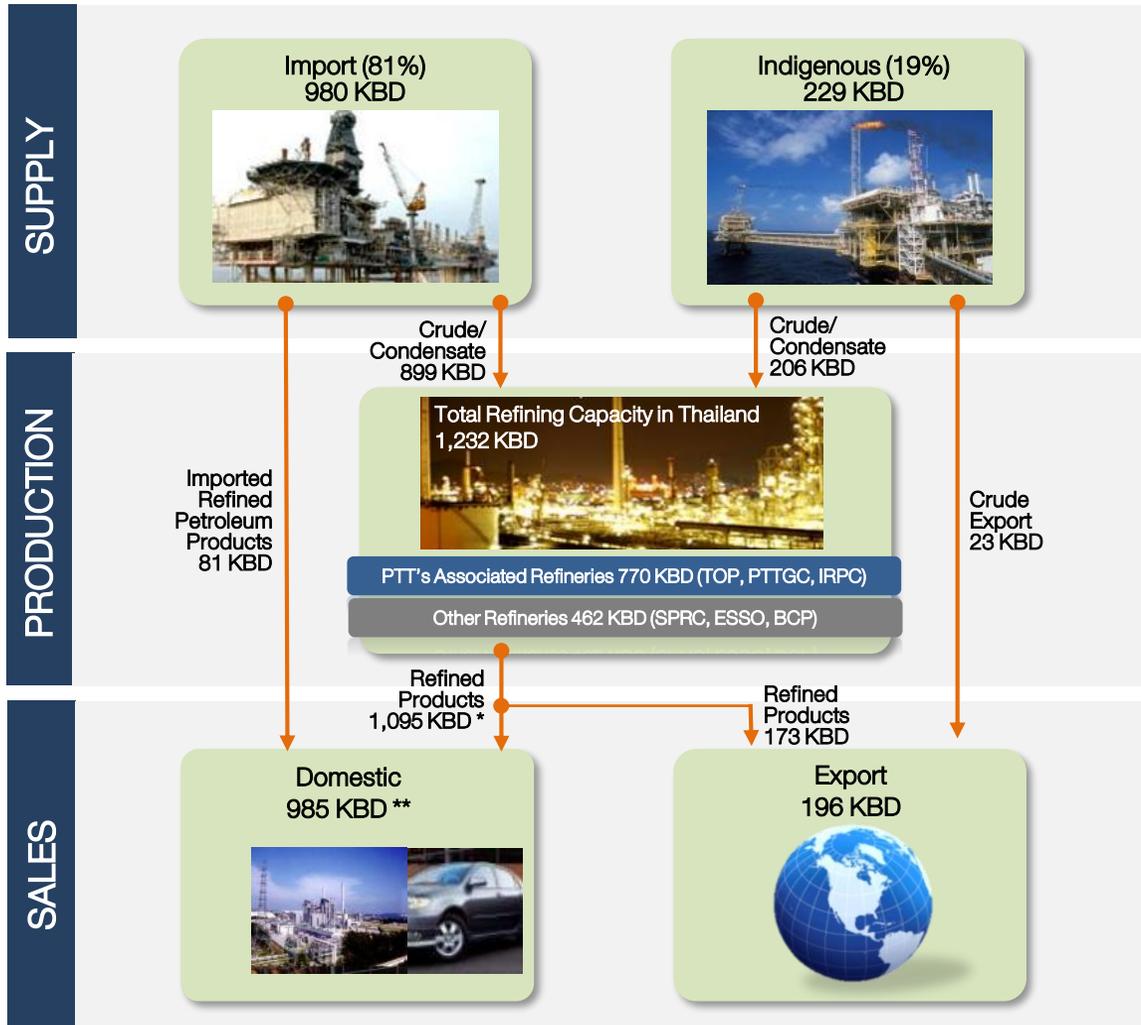
PTTEP contributes almost 1/3 of Thailand's petroleum production



Source: Energy Policy and Planning Office (EPPO) and Department of Mineral Fuels (DMF)

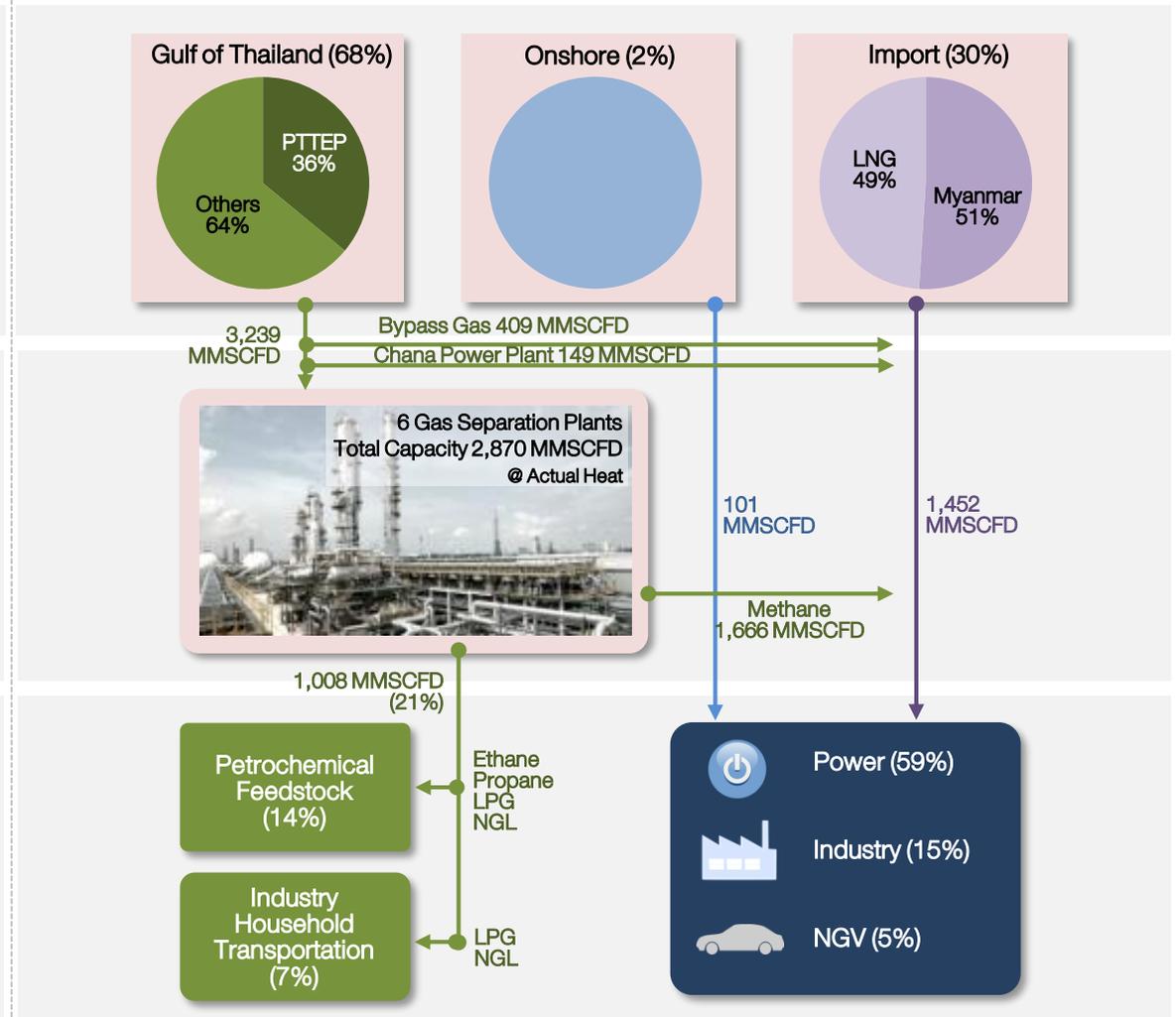
## Oil Balance\*\*\*

Maintains stability supply through adequate refining capacity



## Natural Gas Balance\*\*\*\*

Main driver of the Thailand economy



Source: PTT

Remark: \* Refined product from refineries = 1,102 KBD, including domestic supply of LPG from GSPs and Petrochemical Plants = 106 KBD

\*\* Not included Inventory

\*\*\* Information as of 9M19

\*\*\*\* Information as of 12M19

MMSCFD @ Heating Value 1,000 Btu/ft<sup>3</sup>

MEMBER OF  
**Dow Jones Sustainability Indices**  
 In Collaboration with RobecoSAM

## 2019 DJSI Listed Company

PTTEP has been selected as a member of the 2019 Dow Jones Sustainability Indices (DJSI) for the 6<sup>th</sup> consecutive year and the 2<sup>nd</sup> time as industry leader in the DJSI World Oil and Gas Upstream & Integrated Industry



### Proven business integrity

- Asia's Icon on Corporate Governance 2019 Award  
*Corporate Governance Asia magazine*
- SET Sustainability Award 2018 – Outstanding Category  
*The Stock Exchange of Thailand (SET)*
- Board of the Year Award 2018 (Silver)  
*The Thai Institute of Directors Association (IOD)*



## FTSE4Good FTSE4Good Emerging Index 2019

PTTEP becomes a constituent of the FTSE4Good Emerging Index 2019 for the fourth consecutive year



### Exemplary social contributor

- Best CSR Organizer 2019  
*BAZNAS of Indonesia (The National Zakat Board)*
- Thailand's Best Strategic Corporate Social Responsibility (ranked first)  
*Alpha Southeast Asia Magazine 2018*
- Role Model Organization on Human Rights  
*Department of Rights and Liberties Protection, Ministry of Justice*

### Green driver to environment

- The Excellent Level (G-Gold) of the Green Office Award 2018  
*The Ministry of Natural Resources and Environment*
- Green Leadership Category for T.M.S. Underwater Learning Site Project  
*The Asia Responsible Enterprise Awards 2018*
- Water A List Award  
*Carbon Disclosure Project (CDP)*

## Central Asia

### First presence in Kazakhstan:

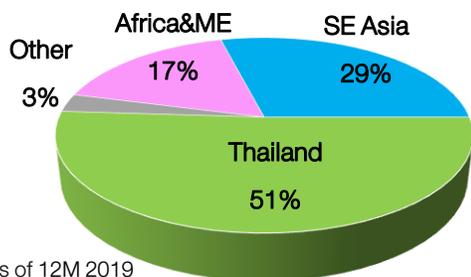
- Production: Dunga onshore oil field from the acquisition of Partex in 2019

## North & South America

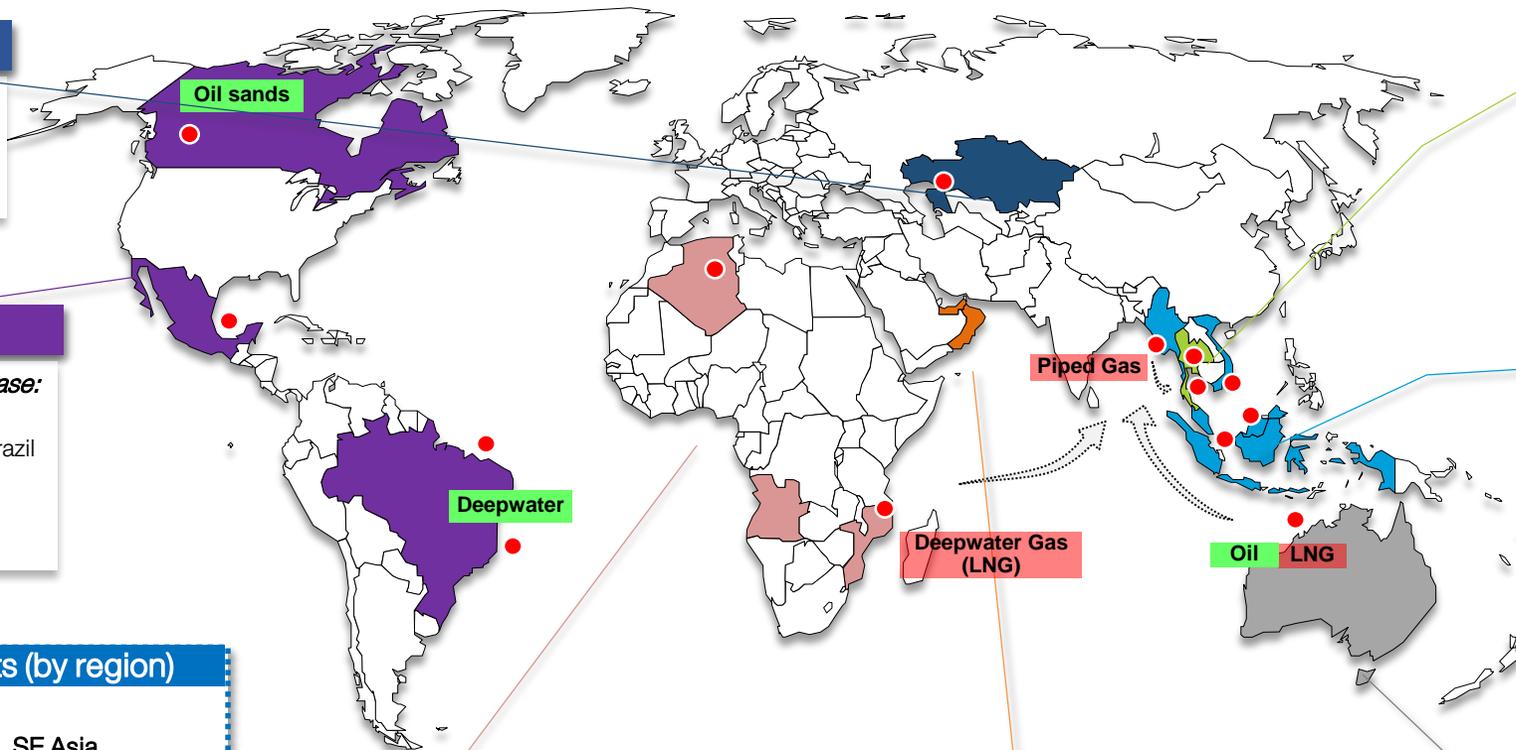
### Opportunities in an early phase:

- Oil Sand project in Alberta
- Deepwater exploration in Brazil and Mexico with prominent and prudent operators

## Book Value of Assets (by region)



Total Assets USD 22.2 billion



## Thailand

### PTTEP's core production base

- 78% of total sales volume
- Key producing assets include Bongkot, Arthit, Contract 4 and S1
- Bongkot (G2/61) and Erawan (G1/61) are in transition process to ensure production continuity

## Southeast Asia

### Second heartland to PTTEP

- 20% of total sales volume mainly from Malaysia and Myanmar
- 3<sup>rd</sup> Largest by resources size in Malaysia with significant gas discovery in Sarawak SK 410B Project
- Gas production in Myanmar mostly supplied into Thailand
- Other producing assets in Vietnam (oil) and Indonesia (gas)

## Africa

### An area for growth, key projects include:

- Production: Algeria's Bir Seba oil field with current flow rate of approximately 18 KBPD
- Development : Algeria's Hassi Bir Rakaiz with target 1st phase production in 2021
- Mozambique Area 1 with target first cargo in 2024

## Middle East

### Presence in UAE and Oman:

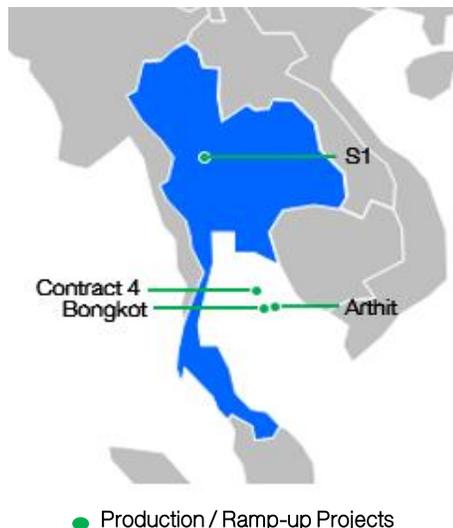
- 2 offshore exploration blocks partnered with experienced operator, ENI in Jan 2019
- 2 onshore producing blocks including PDO (Block 6), the largest producing oil asset in Oman

## Australasia

### Potential gas development

- Sizable undeveloped gas resources in Timor Sea
- Completion of Montara Divestment

## Thailand



### Bongkot (66.6667% WI)

- Average natural gas and condensate sales volume of 810 MMSCFD and 23 KBPD in 12M2019

### S1 (100% WI)

- The largest onshore crude oil production field in Thailand with 12M2019 average crude oil sales volume of 31 KBPD

### Arthit (80% WI)

- Average sales volume in 12M2019 was 226 MMSCFD of natural gas and 11 KBPD of condensates

### Contract 4 (60% WI)

- Average sales rate of 409 MMSCFD for natural gas and 18 KBPD for condensate in 12M2019

## Myanmar



- 3 producing gas fields supplying gas to both Thailand and Myanmar: Yadana, Yetagun, and Zawtika
- Operate Zawtika project, brought online in March 2014 with current gas supply of 297 MMSCFD in 12M2019

### Project Status

#### Production

- Zawtika (80% WI)
- Yadana (25.5% WI)
- Yetagun (19.3% WI)

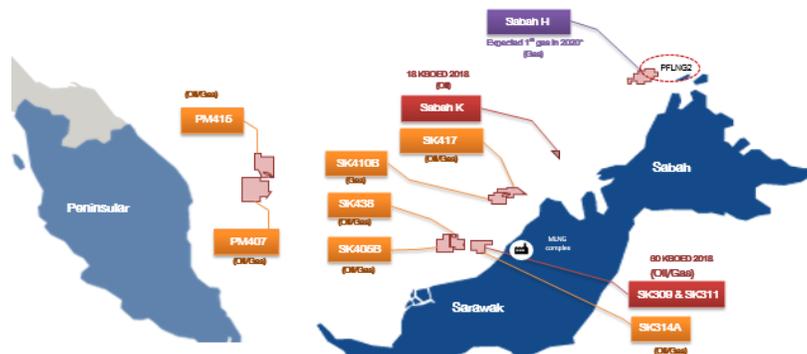
#### Appraisal

- M3 (80% WI)

#### Exploration

- MOGE 3 (77.5% WI)
- M11 (100% WI)
- MD-7 (50% WI)

## Malaysia



### Production

#### Block K Project\* :

Kikeh (56% WI), Siakap North-Petai (SNP) (22.4% WI) and Gumusut-Kakap (GK) (6.4% WI)

- Average production volume in 12M2019 was 27\*\* KBPD of crude oil

#### SK309 and SK311 Project\* (59.5% WI)

For East Patricia field (42% WI)

- Average production volume in 12M2019 was 270\*\* MMSCFD of natural gas and 26\*\* KBPD of condensates and crude.

### Development

#### Block H Project\* :

Rotan field (56% WI) Remaining Area (42% WI)

- First gas expected in Q3/2020
- Full capacity at 270 MMSCFD

### Exploration

#### Sarawak SK410B Project (42.5% WI)

- Multi TCF significant discovery
- Preparing additional drilling of an appraisal well in 2020

#### Other projects

- Evaluating petroleum potentials
- Plan for exploration and appraisal drilling in 2020-2021

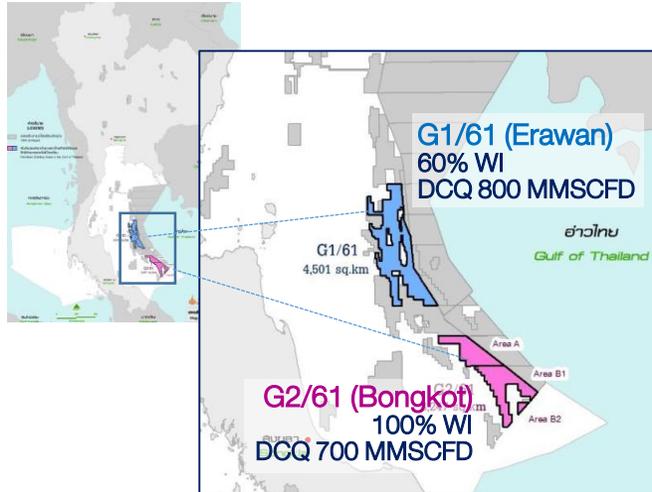
\*This asset is a part of the acquisition of Murphy's business in Malaysia which was completed in July 2019

\*\* The average production volumes per day are calculated from the completion date of acquisition transaction

Note: WI – working interest

# Bongkot and Erawan: Thailand Champion in Domestic Gas Supply

Execute Bongkot and Erawan transition plan to ensure production continuity



## Growing production and reserves profile

- Substantial volume boost for 10 years and beyond
- Immediate remarkable reserves addition
- Minimal risk in production profile



## Generating strong cash flow

- No heavy upfront investment
- Self funding (positive net cash flow)
- Achieved target IRR with strong margin despite lower price

**G1/61 and G2/61: Supply 80% of natural gas production in Thailand**



G1/61	800 MMSCFD	2022
G2/61	700 MMSCFD	2022/2023

### Concrete transition plan:



\*Asset Transfer Agreement (ATA): To be agreed between current concessionaires and DMF by 2021 (1 year prior concession end)  
Source : TOR

# Summary of Terms from Bidding Result of Bongkot and Erawan and PSC Model

## Price Formula

**Pricing Formula:**  $Pr_{(y)} = P_c \times M_{(y)} \times \left( a \frac{PPI_{(y)}}{PPI} + \frac{I_{(y)}}{I} \left\{ b \frac{OM_{(y)}}{OM} + c \frac{DB_{(y)}}{DB} + d \right\} \right)$

$DB_{(y)} < 52$	$M = 0.91 + 0.11 \frac{DB_{(y)}}{52}$
$52 \leq DB_{(y)} < 100$	$M = 1.02 - 0.15 \frac{DB_{(y)} - 52}{48}$
$DB_{(y)} > 100$	$M = 0.22 + 6.44 \times \frac{1}{\sqrt{DB_{(y)}}}$

Whereas:

Pr: Gas Price  
 Pc: Price Constant  
 I: Exchange rate  
 PPI: Producer Price Index  
 OM: PPI for Oil Machinery and Tools  
 DB: Dubai oil price

Base year numbers (2016): PPI = 101.4167 I = 35.3 THB/USD OM = 214.88 DB = 41.27\$/BBL

$Pr_{(y)} = 116 \times M_{(y)} \times \left( 0.25 \frac{PPI_{(y)}}{101.4167} + \frac{I_{(y)}}{35.3} \left\{ 0.3 \frac{OM_{(y)}}{214.88} + 0.4 \frac{DB_{(y)}}{41.27} + 0.05 \right\} \right)$

## Terms

	G2/61 (Bongkot)	G1/61 (Erawan)
Price Constant	116 THB per MMBTU	116 THB per MMBTU
Contractor's Profit Split	30%	32%
Bonuses	Signature Bonus* 1,050 MMTHB Production Bonus** 1,575 MMTHB Supporting Contribution 7 MMTHB Other benefits 685 MMTHB	Signature Bonus* 1,050 MMTHB Production Bonus** 1,575 MMTHB Supporting Contribution 7 MMTHB Other benefits 35 MMTHB
Thai Employee Ratio	99%	98%
Facility Bonus***	175 MMTHB	350 MMTHB

### Remark of payment terms:

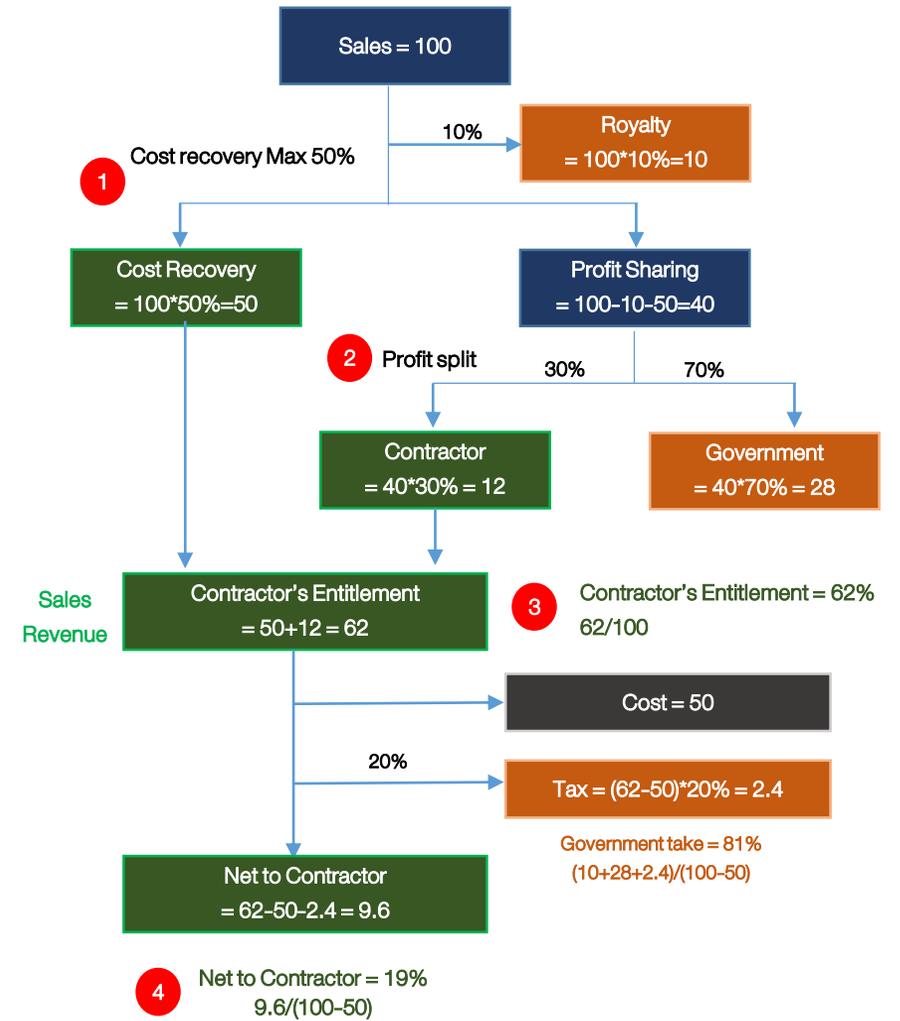
\* No later than 10 working days prior to the PSC signing date

\*\* Each time the cumulative production/sales reaches 100, 200 and 300 MMBOE

\*\*\* Equally separate into 3 payments by 24th April of every year from 2022

Source: Press release from Department of Mineral Fuels (13 December 2018) and TOR

## PSC Model

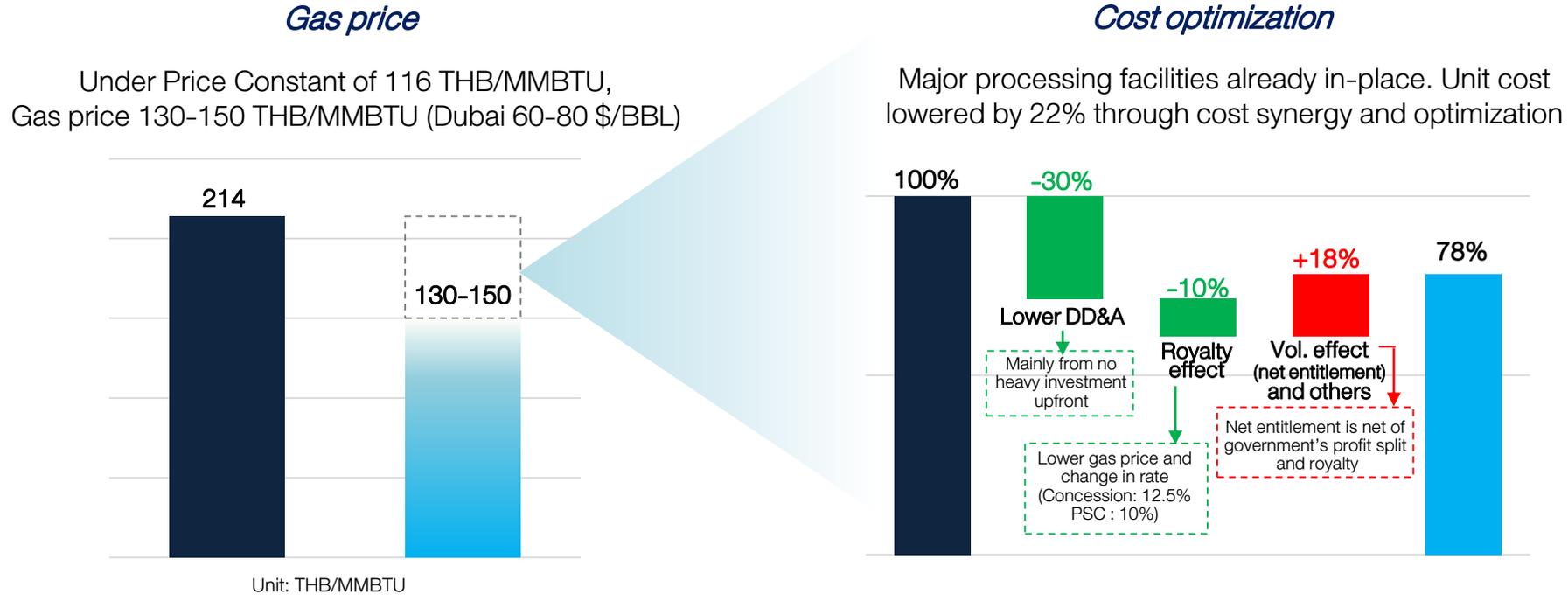


\*Assumption bases on field life, cost can be fully recovered

# Bongkot and Erawan: Thailand Champion in Domestic Gas Supply

Achievable cost optimization to sustain target return

With new gas price, we can achieve target IRR



Enablers of cost synergy and optimization through economy of scale and technology improvement

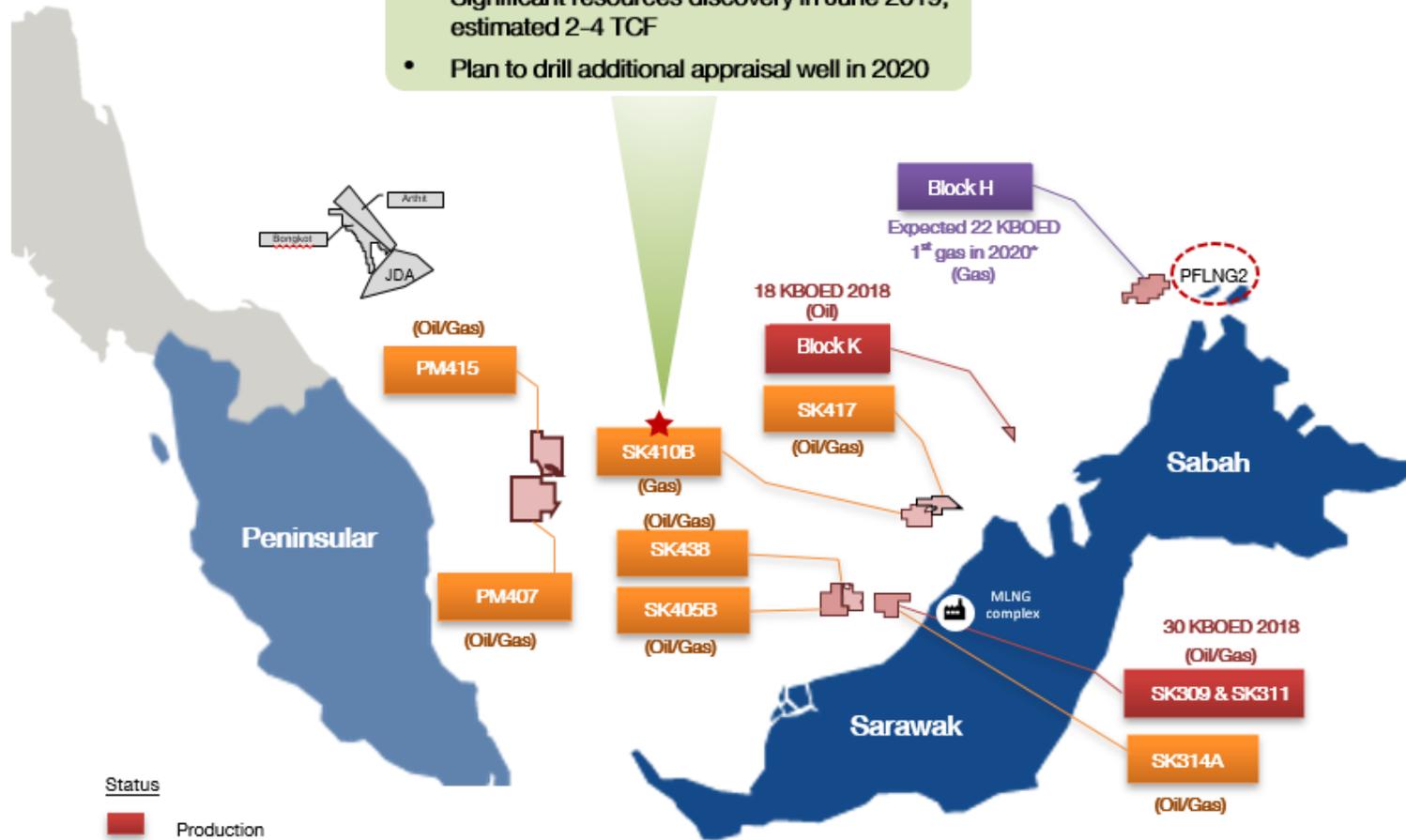
Wellhead Platform	Drilling & Well	Logistics	Decommissioning
<ul style="list-style-type: none"> <li>Lean design standardization</li> <li>Volume bundling &amp; contracting strategy</li> <li>Platform topside and facility reuse</li> </ul>	<ul style="list-style-type: none"> <li>Implement factory drilling</li> <li>Utilize drilling rig with GoT-fitted specifications</li> <li>Optimize drilling rig &amp; service contracts across GoT</li> </ul>	<ul style="list-style-type: none"> <li>Synergy and optimize marine and aviation fleets across GoT</li> <li>Procurement strategy</li> </ul>	<ul style="list-style-type: none"> <li>Innovative solutions / technologies</li> <li>Economy of Scales</li> </ul>

# Malaysian Assets

A new growth platform for PTTEP in South East Asia

## Exploration Success in SK410B

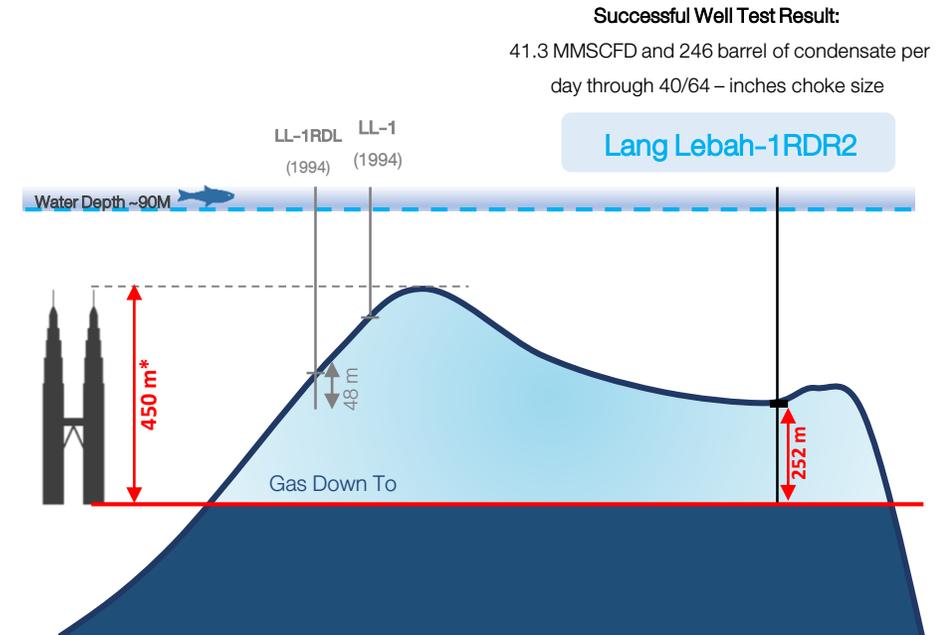
- Significant resources discovery in June 2019, estimated 2-4 TCF
- Plan to drill additional appraisal well in 2020



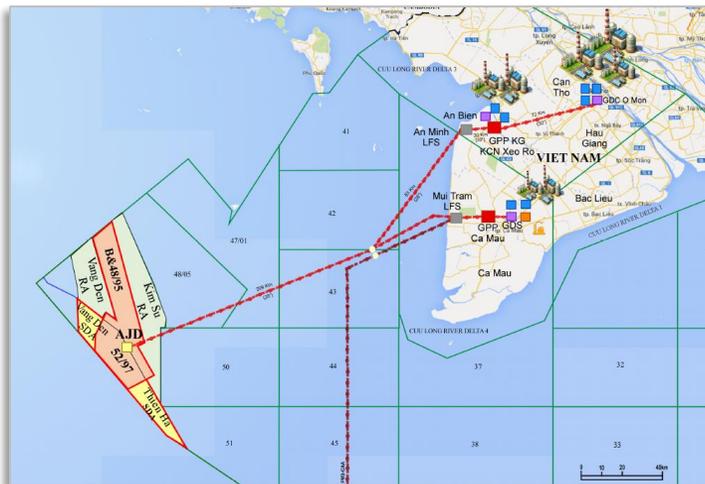
**Status**  
■ Production  
■ Development  
■ Exploration

\* Volume stated represents net sale volume

- With completion of Murphy's acquisition, PTTEP has become the 3<sup>rd</sup> Largest player by resources size in Malaysia
- Diversified portfolio, with expected contribution around 50 KBOED of sales volume in 2020
- Execute Transition Plan to capture upside value in Malaysian clusters



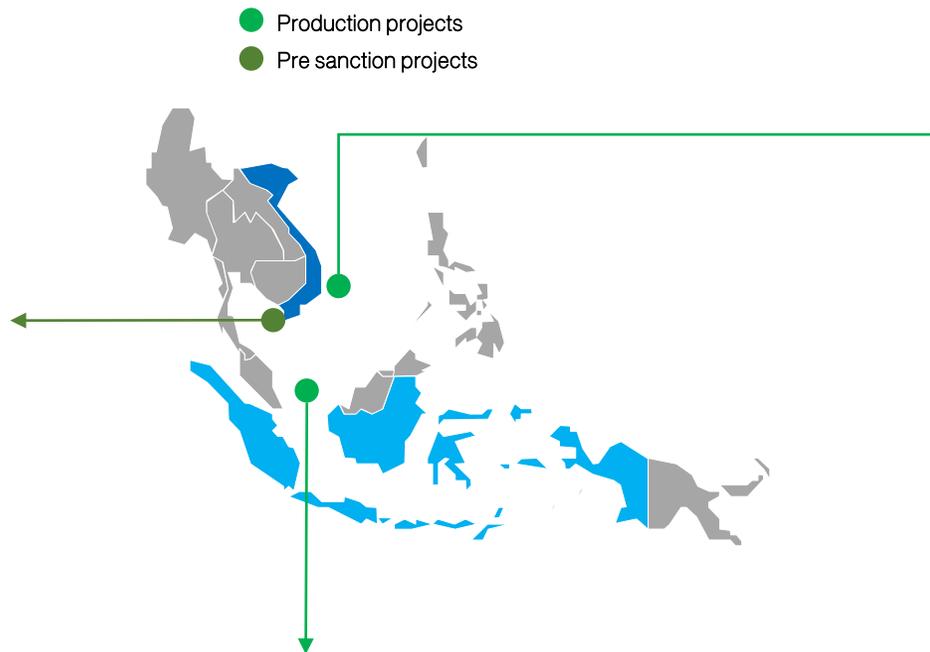
## Vietnam and Indonesia



### Southwest Vietnam

- Vietnam B & 48/95 (8.5% WI)
- Vietnam 52/97 (7% WI)

- Field Development Plan was approved by Government
- The project is currently in the negotiation process on commercial terms to put forward FID
- First production target by end of 2023, and ramp up to full capacity of 490 MMSCFD



**Vietnam 16-1 (28.5% WI)**

- Average sales volume of crude oil was 16 KBPD in 12M2019
- The project is currently drilling an additional production well to maintain production plateau.

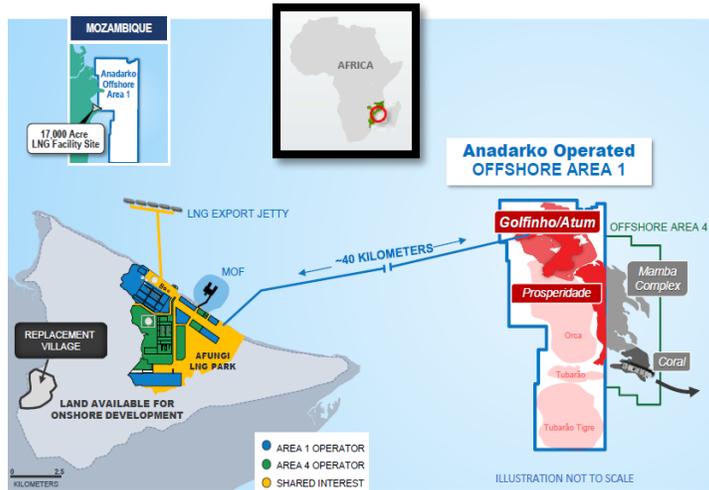


**Natuna Sea A (11.5% WI)**

- Average sales volume of natural gas was 195 MMSCFD in 12M2019

# Mozambique Area 1

FID, on the path of unlocking value from world class LNG asset



Substantial recoverable resources of approximately 75 tcf with scalable offshore development expending up to 50 MTPA

## Location and Cost Advantage

- Close proximity to shore
- High quality reservoirs  
*capable of flow up to 200 mmcf/d per well*
- Access to Asian and European markets

## Achievements

- ✔ Legal & Contractual Framework
- ✔ Plan of Development Approved
- ✔ Onshore & Offshore Contractors Awarded
- ✔ First Mover for the Marine Facility
- ✔ LNG SPAs ~11.1 MTPA



FID in June 2019  
with initial 2 trains of  
12.88 MTPA capacity

## Way Forward

- ✔ Project Finance  
*(2/3 Project Financed)*
- ✔ Drilling & Completion
- ✔ Onshore Construction and Offshore Installation
- ✔ Operation Readiness
- ✔ LNG Shipping



1<sup>st</sup> Cargo  
expected  
2024

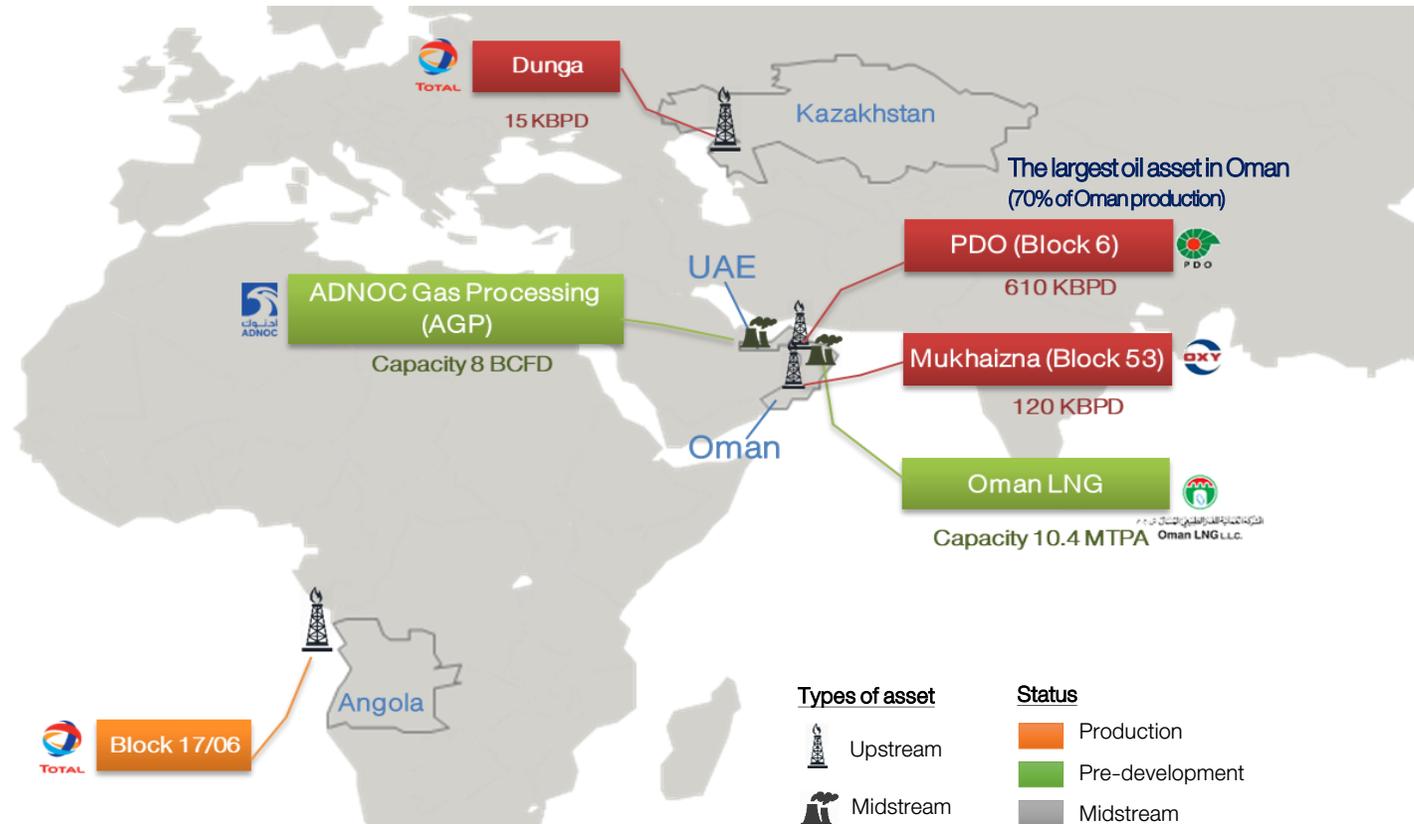
# Acquisition of Partex

Partnering with experienced operators in the Middle East

- PTTEP acquired 100% shares in Partex, which completed on 4 November 2019
- The major assets are in Oman and UAE which include PDO (Block 6), the largest oil asset in Oman
- Formulating transition to integrate insights of Middle East

## “Gateway to Future Regional Investment”

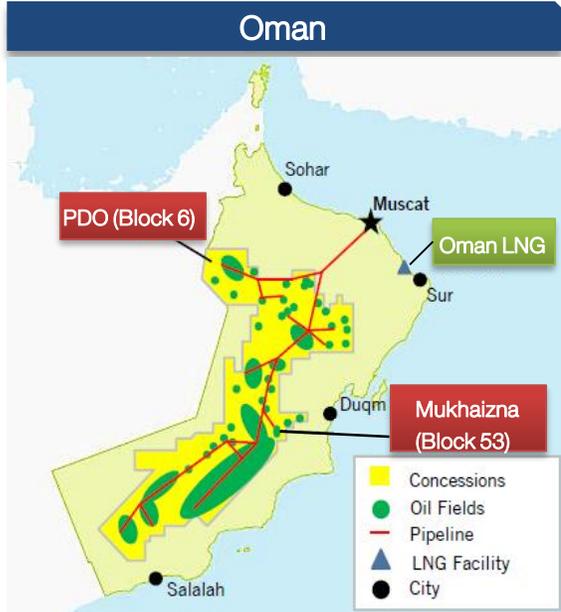
-  Prolific Area
-  Strong Partnerships
-  World-Class Assets
-  Self funded with existing production
  - Sales volume +16,000 barrels/day
  - 2P Add +65 million barrels



Note: Volumes stated represent gross volumes (100%)

# The Middle East : World Class Assets under Partex

Access to the largest oil asset in Oman and mega Midstream Complex



## PDO (Block 6)

- Largest asset covering around 1/3 of the country
- Long-life asset, produced only 15% of reserves in-place
- Multi-field oil production: 610,000 BPD (70% of Oman production)
- Experienced and reputable partners



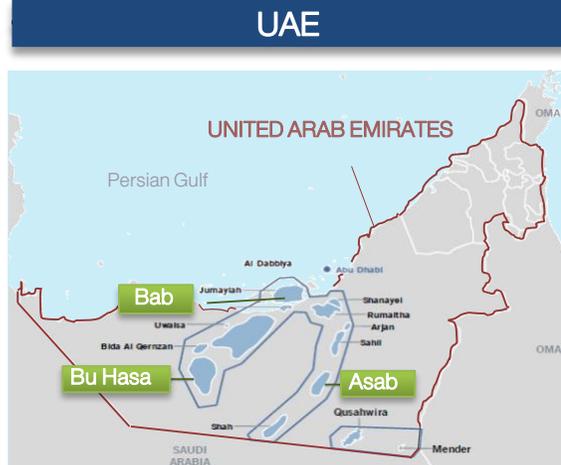
## Mukhaizna (Block 53)

- Largest single onshore producing field in Oman
- Oil production: 120,000 BPD (13% of Oman production)
- Strong and experienced operator



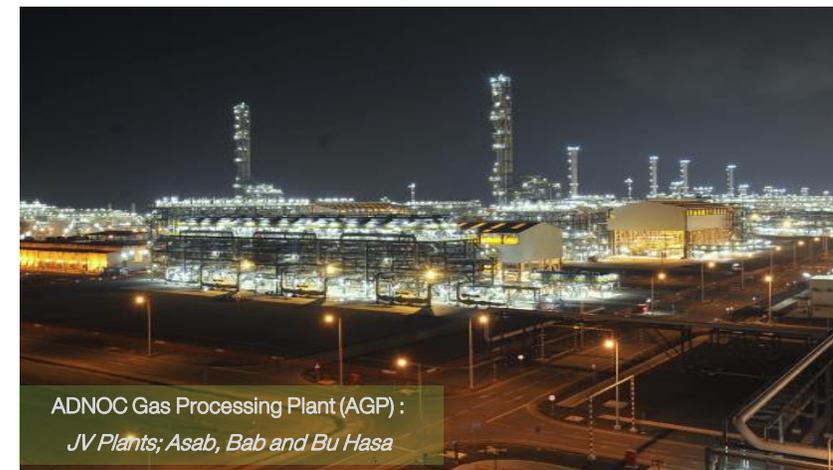
## Oman LNG

- The only LNG facility in Oman
- Processing capacity 10.4 MTPA
- Contracted LNG sales to international buyers: Japan and South Korea



## ADNOC Gas Processing (AGP)

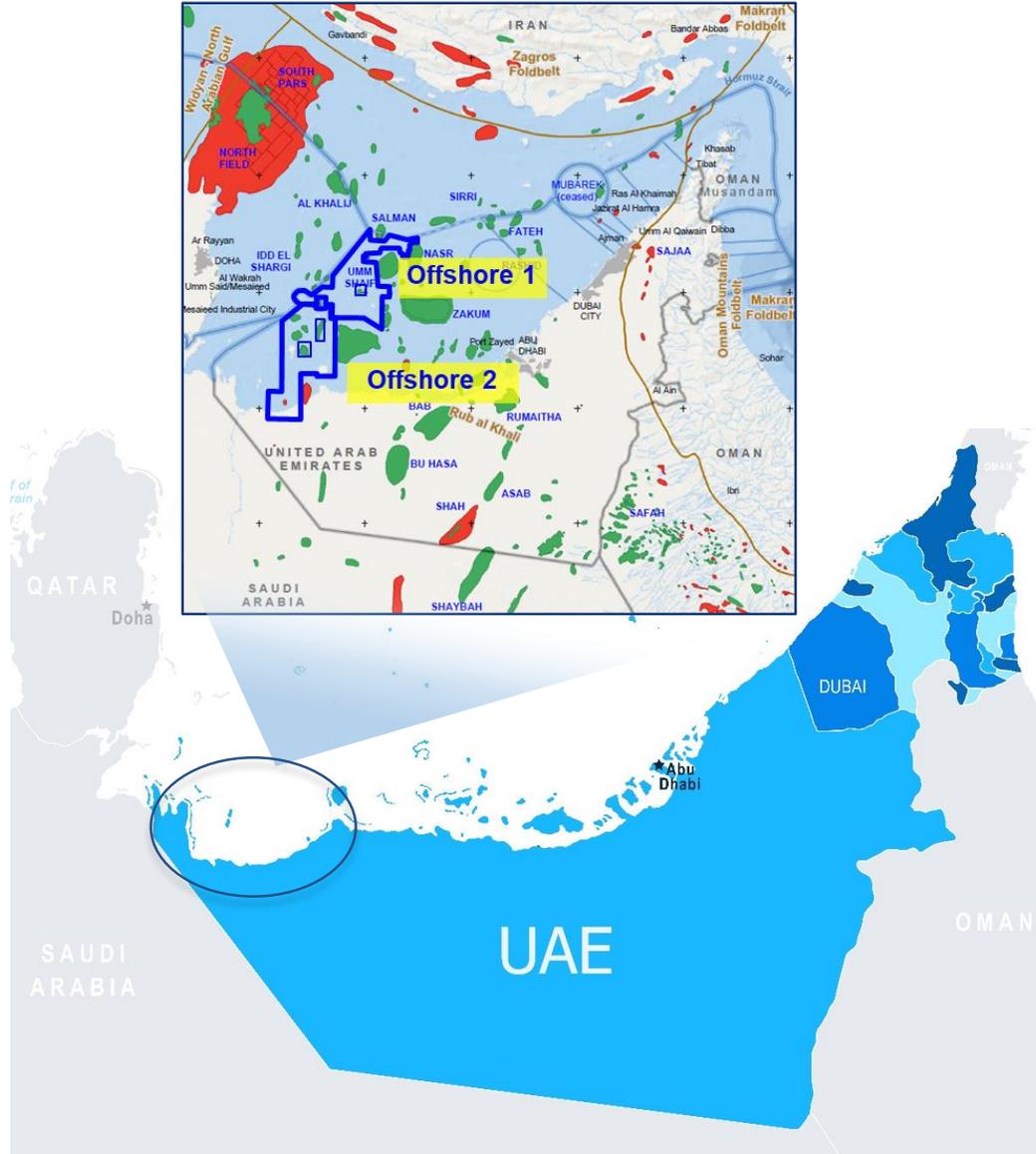
- One of the largest gas processing complexes in the world (total capacity of 8 BCFD)  
*JV: 3 plants with capacity of 1.2 BCFD*  
*Adnoc: 2 plants with capacity of 6.9 BCFD*
- Essential to Abu Dhabi and UAE's economy
- Sizeable volumes of Propane, Butane and Naphtha offtake
- Strong and experienced partners



ADNOC Gas Processing Plant (AGP) :  
 JV Plants; Asab, Bab and Bu Hasa

# The Middle East : United Arab Emirates

“Partnering” to JV with prudent operators in prolific low cost area



Project Overview		
PTTEP's Block	Abu Dhabi Offshore 1	Abu Dhabi Offshore 2
Location	North-west of Abu Dhabi Emirates, United Arab Emirates	
Characteristics	Shallow water	
Partners (exploration phase)	ENI 70% (Operator) PTTEP 30%	
Exploration Strategy	<ul style="list-style-type: none"> <li>• Joined hand with prudent operators</li> <li>• UAE still has high potential prospective resources with significant sizeable discoveries</li> </ul>	



The award of Abu Dhabi Offshore Exploration Blocks 1 & 2 on 12<sup>th</sup> January 2019

-- Entry into high potential petroleum province at exploration phase --

## Canada Oil Sands



### Project Overview

- Operates 100% interest of the Thornbury, Hangingstone and South Leismer (THSL) areas (exploration and appraisal phase)
- Potential large resource base with over a billion barrel
- The project is currently under the evaluation for appropriate development plan

## Deep Water Brazil



### Barreirinhas AP1

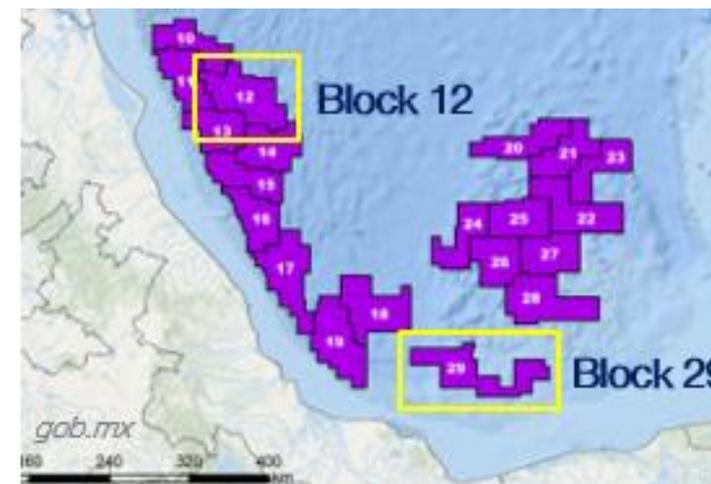
- Farm-in 25% from BG Group in 2014
- Operated by Shell Brasil (65% interest)
- Four offshore exploration blocks: BAR-M-215, BAR-M-217, BAR-M-252 and BAR-M-254

### BM-ES-23

- Acquired 20% interest from Shell in Q3 2014
- Partnered with Petrobras (65%, operator) and INPEX (15%)

In 2019, Both projects are currently evaluating the petroleum potential

## Gulf of Mexico, Mexico



**PTTEP's Block:** Block 12 (20%) and Block 29 (16.67%), as non-operating partner

**Location:** Mexican Ridges Basin for Block 12 and Campeche Basin for Block 29

**Characteristic:** Deep-water with high petroleum potentials and attractive fiscal regime

In 2019, projects received the exploration plan approval from the National Hydrocarbons Commission in Mexico and are currently evaluating the petroleum potential for further process according to the approved plan. Mexico block 29 (2.4) Project is in process of preparation for 2 exploration wells to be drilled in 2020.

# LNG Value Chain Investment : MLNG Train 9

First step into midstream LNG business in strategic area of focus

10% Investment in MLNG Train 9 by PTT Global LNG....

....continue to look for more LNG opportunities globally



MLNG Train 9 – Overview												
Location	Bintulu, Sarawak, Malaysia											
Asset	Liquefaction Train 9 Tank 7											
Phase	Commercial: Jan 2017											
Capacity	3.6MTPA											
Contract Life	20 years											
Partners (subject to closing)	<table border="0"> <tr> <td>Petronas</td> <td>65%</td> <td rowspan="5"> </td> </tr> <tr> <td>JX Nippon</td> <td>10%</td> </tr> <tr> <td>PTT Global LNG</td> <td>10%</td> </tr> <tr> <td>Sarawak State</td> <td>10%</td> </tr> <tr> <td>Sabah State</td> <td>5%</td> </tr> </table>	Petronas	65%		JX Nippon	10%	PTT Global LNG	10%	Sarawak State	10%	Sabah State	5%
Petronas	65%											
JX Nippon	10%											
PTT Global LNG	10%											
Sarawak State	10%											
Sabah State	5%											

## Investment Rationales

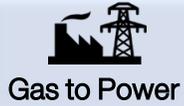
- Venture into midstream LNG as a mean to secure LNG supply and growth of PTT and PTTEP, as well as capture value added along with LNG value chain
- Low risk and highly market secured opportunity
  - Highly experienced operator
  - Already commenced commercial production with immediate revenue stream

## Key activity in 2020

- Keep maximizing LNG production up to plant capacity
- Continue to improve plant reliability & utility rejuvenation
- Get ready for 2021 plant turnaround

# New Business Opportunities

Expand value chain, create innovation and step towards long-term sustainability



## “Integrated Energy Solution”



E&P

+



Pipeline

+



Power Plant

- Enhance value of existing assets in Myanmar e.g. Zawtika, M3
- Support Myanmar pipeline infrastructure development
- Partner with Independent Power Producer (IPP)



## “Cutting Edge Technology for E&P and more”

### UAV



#### Aerial inspection service:

- Flare Tower
- Telecommunication Tower
- Tank inspection

### AUV



#### Subsea Inspection & Surveillance:

- Pipeline and structural inspection
- Geophysical survey
- Gas leak survey

### Non E&P



#### Focused Sectors:

- Agriculture
- Environmental
- Security

Remark: UAV is Unmanned Aerial Vehicle. AUV is Autonomous Underwater Vehicle.

	Project	Status*	Phase	PTTEP's Share	Partners (as Sep 2019)	12M2019 Average Sales Volume **		2020 Key Activities	
						Gas (MMSCFD)	Liquid (KBPD)		
<b>Thailand and JDA</b>									
1	Arthit	OP	Production	80%	Chevron MOECO	16% 4%	226	11	<ul style="list-style-type: none"> <li>Ensure gas deliverability level at DCQ***</li> <li>Drill development wells</li> </ul>
2	B6/27	OP	Production	100%			-	-	<ul style="list-style-type: none"> <li>Prepare for decommissioning activities</li> </ul>
3	B8/32 & 9A	JV	Production	25%	Chevron MOECO KrisEnergy Palang Sophon	51.66% 16.71% 4.63% 2%	69	21	<ul style="list-style-type: none"> <li>Drill development wells</li> <li>Perform waterflood activities</li> </ul>
4	Bongkot	OP	Production	66.6667%	TOTAL	33.3333%	810	23	<ul style="list-style-type: none"> <li>Maintained production level as planned</li> <li>Prepare for decommissioning activities</li> </ul>
5	Contract 3 (Formerly Unocal III)	JV	Production	5%	Chevron MOECO	71.25% 23.75%	629	41	<ul style="list-style-type: none"> <li>Drill development wells</li> <li>Prepare for decommissioning activities</li> </ul>
6	Contract 4 (Formerly Pailin)	JV	Production	60%	Chevron MOECO	35% 5%	409	18	<ul style="list-style-type: none"> <li>Ensure gas deliverability level at DCQ***</li> <li>Drill development wells</li> </ul>
7	E5	JV	Production	20%	ExxonMobil	80%	8	-	<ul style="list-style-type: none"> <li>Ensure gas deliverability level at DCQ***</li> </ul>
8	G4/43	JV	Production	21.375%	Chevron MOECO Palang Sophon	51% 21.25% 6.375%	2	3	<ul style="list-style-type: none"> <li>Drill development wells</li> </ul>
9	G4/48	JV	Production	5%	Chevron MOECO	71.25% 23.75%	3	0.7	<ul style="list-style-type: none"> <li>Drill development wells</li> </ul>
10	L53/43 & L54/43	OP	Production	100%			-	1.7	<ul style="list-style-type: none"> <li>Maintain production plateau</li> <li>Drill development wells</li> </ul>
11	PTTEP1	OP	Production	100%			-	0.228	<ul style="list-style-type: none"> <li>Drill a development well</li> <li>Maintain production plateau</li> </ul>
12	S1	OP	Production	100%			10	Crude: 31 KBPD LPG: 0.2 KMT/D	<ul style="list-style-type: none"> <li>Drill development wells</li> <li>Enhance oil recovery program includes hydraulic fracturing and artificial lift</li> </ul>
13	Sinphuhorm	OP	Production	55%	Apico**** ExxonMobil	35% 10%	84	0.273	<ul style="list-style-type: none"> <li>Ensure gas deliverability</li> <li>Drill an exploration well and development wells</li> </ul>

\* Status: OP = PTTEP operatorship / JOC = PTTEP joint operatorship / JV = PTTEP Joint Venture Partner

\*\* Sales volume stated at 100% basis.

\*\*\* DCQ = Daily Contractual Quantity

\*\*\*\* PTTEP holds indirectly and directly 80.48% participating interest in Sinphuhorm Project. APICO also holds 100% participating interest in Block L15/43 and Block L27/43.

	Project	Status*	Phase	PTTEP's Share	Partners (as of Sep 2019)		12M2019 Average Sales Volume **		2020 Key Activities
							Gas (MMSCFD)	Liquid (KBPD)	
<b>Thailand and JDA</b>									
14	L22/43	OP	Production	100%			-	-	<ul style="list-style-type: none"> <li>Maintain production operation</li> </ul>
15	MTJDA	JOC	Production	50%	Petronas-Carigali	50%	334	9.4	<ul style="list-style-type: none"> <li>Drill development wells</li> <li>Ensure gas deliverability level at DCQ***</li> </ul>
16	G9/43	OP	Exploration	100%					
17	G1/61 (Erawan)	OP	Exploration	60%	MP G2 (Thailand) Limited	40%			<ul style="list-style-type: none"> <li>Awarded as an operator for Erawan field (Contract 1, 2 and 3) under PSC (after concession-end in 2022)</li> <li>E&amp;A study (seismic interpretation)</li> <li>Installation new head platform</li> </ul>
18	G2/61 (Bongkot)	OP	Exploration	100%					<ul style="list-style-type: none"> <li>Awarded as a sole operator under PSC (after concession-end in 2022/2023)</li> <li>Drill appraisal and exploration wells</li> <li>Installation new head platform</li> </ul>
<b>Others SEA</b>									
1	Malaysia	OP (except Gumusut-Kakap (GK) in Sabah K)	Production/ Exploration/ Development	6.4-80% (varied by permits)			SK309 and SK311 270	SK309 and SK311 26 Block K 27	<ul style="list-style-type: none"> <li>Production projects(SK309 and SK311, Block K): Maintain production plateau</li> <li>Block H: first gas expected in Q3/2020</li> <li>Sarawak SK410B: drill an appraisal well</li> <li>Other exploration projects: drill exploration wells, G&amp;G study and perform 3D seismic activities</li> </ul>
2	Yadana	JV	Production	25.5%	TOTAL Chevron MOGE	31.24% 28.26% 15%	776	-	<ul style="list-style-type: none"> <li>Drill exploration and development wells</li> <li>Ensure gas deliverability level at DCQ***</li> </ul>
3	Yetagun	JV	Production	19.3178%	Petronas-Carigali MOGE Nippon Oil PC Myanmar (Hong Kong)	30.00140% 20.4541% 19.3178% 10.90878%	105	2.3	<ul style="list-style-type: none"> <li>Maintain production level</li> <li>Drill exploration and development wells</li> </ul>
4	Zawtika (M9 & a part of M11)	OP	Production	80%	Myanma Oil and Gas Enterprise (MOGE)	20%	297	-	<ul style="list-style-type: none"> <li>Ensure gas deliverability level at DCQ***</li> <li>Drill exploration and development wells</li> <li>Perform 3D seismic activities</li> </ul>
5	Myanmar M3	OP	Exploration	80%	MOECO	20%			<ul style="list-style-type: none"> <li>FEED/ Subsurface/ Surface studies</li> <li>Negotiate and finalize GSA</li> </ul>
6	Myanmar M11	OP	Exploration	100%					<ul style="list-style-type: none"> <li>Perform 3D seismic activities</li> <li>Block relinquish</li> </ul>
7	Myanmar MD-7	OP	Exploration	50%	TOTAL	50%			<ul style="list-style-type: none"> <li>Drill an exploration well</li> <li>3D Reprocessing seismic activities</li> <li>G&amp;G studies</li> </ul>

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\*\* Sales volume stated at 100% basis except Malaysia (Production volume 100% as of 12M/2019/ For Block K, gross production is net off unitization

\*\*\* DCQ = Daily Contractual Quantity

	Project	Status*	Phase	PTTEP's Share	Partners (as of Sep 2019)	12M2019 Average Sales Volume		2020 Key Activities	
						Gas (MMSCFD)	Liquid (KBPD)		
<b>Others SEA</b>									
8	Myanmar MOGE 3	OP	Exploration	77.5%	Palang Sophon MOECO WinPreciousResources	10% 10% 2.5%		<ul style="list-style-type: none"> <li>G&amp;G studies</li> <li>Complete site reinstatement</li> </ul>	
9	Vietnam 9-2	JOC	Production	25%	PetroVietnam SOCO	50% 25%	14	4.4	<ul style="list-style-type: none"> <li>Maintain production level</li> <li>Perform well intervention program</li> <li>Development drilling study support</li> </ul>
10	Vietnam 16-1	JOC	Production	28.5%	PetroVietnam SOCO OPECO	41% 28.5% 2%	7	16	<ul style="list-style-type: none"> <li>Maintain production level</li> <li>Drill development wells</li> </ul>
11	Vietnam B & 48/95	JV	Exploration	8.5%	PVN MOECO	65.88% 25.62%			<ul style="list-style-type: none"> <li>FEED study</li> <li>Negotiation process on commercial terms in order to push forward the Final Investment Decision (FID)</li> <li>the first production target at the end of 2023</li> </ul>
12	Vietnam 52/97	JV	Exploration	7%	PVN MOECO	73.4% 19.6%			<ul style="list-style-type: none"> <li>FEED study</li> <li>Negotiation process on commercial terms in order to push forward the Final Investment Decision (FID)</li> <li>the first production target at the end of 2023</li> </ul>
13	Natuna Sea A	JV	Production	11.5%	Premier Oil KUFPEC Petronas Pertamina	28.67% 33.33% 15% 11.5%	195	1.3	<ul style="list-style-type: none"> <li>FEED study: Start Anoa &amp; Gajah Baru compressor project</li> </ul>
<b>Middle East</b>									
1	Abu Dhabi Offshore 1	JV	Exploration	30%	Eni Abu Dhabi	70%			<ul style="list-style-type: none"> <li>Reprocess Seismic</li> <li>G&amp;G studies</li> </ul>
2	Abu Dhabi Offshore 2	JV	Exploration	30%	Eni Abu Dhabi	70%			<ul style="list-style-type: none"> <li>Drill an exploration well</li> <li>Perform 3D seismic activities</li> </ul>
3	PDO (Block 6)	JOC	Production	2%	Government of Oman Shell Total	60% 34% 4%		618**	<ul style="list-style-type: none"> <li>A part of Partex acquisition which was completed on 4 November 2019</li> <li>Maintain production plateau</li> </ul>
4	Mukhaizna	JV	Production	1%	Occidental OOCEP Indian Oil Mubadala	47% 20% 17% 15%		109**	<ul style="list-style-type: none"> <li>A part of Partex acquisition which was completed on 4 November 2019</li> <li>Maintain production plateau</li> </ul>
5	Block 12	JV	Exploration	20%	Total	20%			<ul style="list-style-type: none"> <li>Signed Exploration and Production Sharing Agreement (EPSA) with Oman's Ministry of Oil and Gas (MOG) for exploration and production rights on 19 Feb 2020</li> </ul>

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\*\* The average sales volumes per day are calculated from the completion date of acquisition transaction

	Project	Status*	Phase	PTTEP's Share	Partners (as of Sep 2019)		12M2019 Average Sales Volume **		2020 Key Activities
							Gas (MMSCFD)	Liquid (KBPD)	
<b>Other International</b>									
1	PTTEP Australasia (PTTEP AA)	OP	Exploration	90%-100% (varied by permits)					<ul style="list-style-type: none"> <li>AC/RL7 (Cash Maple): under the evaluation of appropriated development plan and seeking partner to manage the project's risk</li> <li>Other exploration projects: G&amp;G and P&amp;A studies</li> <li>AC/L3: total block relinquishment</li> </ul>
2	Mozambique Area 1	JV	Development	8.5%	Total, Mitsui, ENH, ONGC Beas Rovuma, Bharat	26.5%, 20% 15%, 10% 10%, 10%			<ul style="list-style-type: none"> <li>First Cargo is expected by 2024</li> <li>Finalize project Finance</li> <li>Continue Onshore and Offshore well construction</li> <li>Complete Resettlement</li> </ul>
3	Algeria 433a & 416b (Bir Seba)	JOC	Production	35%	PetroVietnam Sonatrach	40% 25%	-	18 (net entitlement)	<ul style="list-style-type: none"> <li>Drill production wells</li> </ul>
4	Algeria Hassi Bir Rekaiz	OP	Development	24.5%	CNOOC Sonatrach	24.5% 51%			<ul style="list-style-type: none"> <li>Drilling development wells</li> <li>FEED study</li> <li>Continue Improvement oil study (IOR)</li> </ul>
5	Mariana Oil Sands	OP	Exploration	100%					<ul style="list-style-type: none"> <li>Assess appropriated development approach</li> </ul>
6	Barreirinhas AP1	JV	Exploration	25%	Shell Brasil Mitsui E&P Brasil	65% 10%			<ul style="list-style-type: none"> <li>G&amp;G studies</li> </ul>
7	Brazil BM-ES-23	JV	Exploration	20%	Petrobras INPEX	65% 15%			<ul style="list-style-type: none"> <li>G&amp;G studies</li> </ul>
8	Mexico block 12 (2.4)	JV	Exploration	20%	PC Carigali Mexico Ophir Mexico	60% 20%			<ul style="list-style-type: none"> <li>EIA and G&amp;G study to access petroleum potential</li> </ul>
9	Mexico block 29 (2.4)	JV	Exploration	16.67%	Repsol Mexico PC Carigali Mexico Sierra Nevada	30% 28.33% 25%			<ul style="list-style-type: none"> <li>Drilling Exploration wells</li> <li>G&amp;G study to access petroleum potential</li> </ul>

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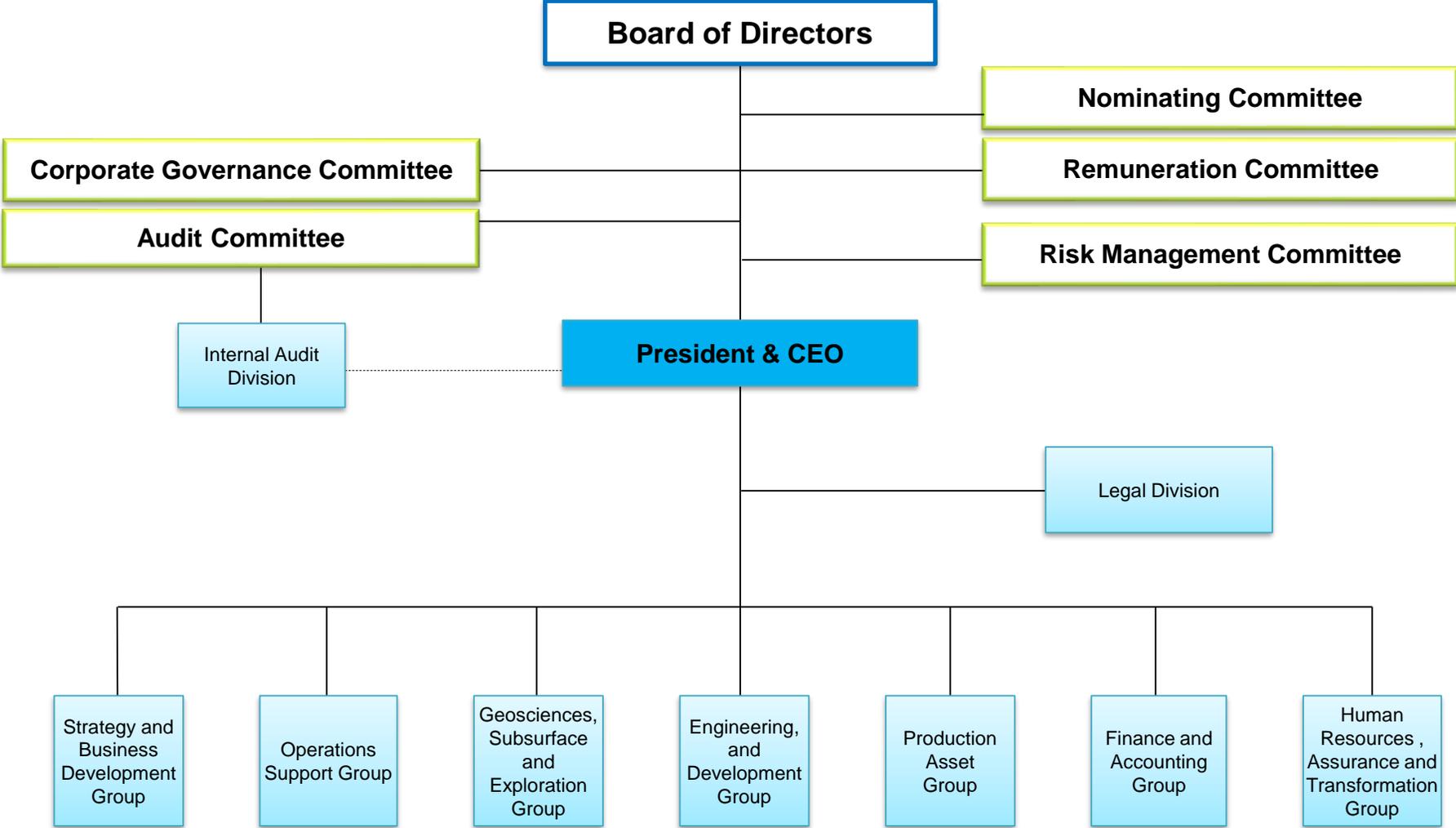
\*\* Sales volume stated at 100% basis except for Algeria 433a & 416b (Net Entitlement)

	Project	Status*	Phase	PTTEP's Share	Partners (as of Sep 2019)	12M2019 Average Sales Volume **		2020 Key Activities
						Gas (MMSCFD)	Liquid (KBPD)	
<b>Other International</b>								
10	Block 17/06	JV	Pre development	2.5%	Total 30% Sonangol 30% SSI 27.5% Acrep 5% Falcon Oil 5%			<ul style="list-style-type: none"> <li>A part of Partex acquisition which was completed on 4 November 2019</li> <li>Maintain production plateau</li> </ul>
11	Potiguar	OP	Production	50%	Petro reconcavo 50%		0.2	<ul style="list-style-type: none"> <li>A part of Partex acquisition which was completed on 4 November 2019</li> <li>Maintain production plateau</li> </ul>
12	Dunga	JV	Production	20%	Total* 60% OOCEP 20%	2	11	<ul style="list-style-type: none"> <li>A part of Partex acquisition which was completed on 4 November 2019</li> <li>Maintain production plateau</li> </ul>
<b>Midstream Project</b>								
1	Oman LNG	Shareholder	On line	2%	Government of Oman 51% Shell 30% Total 5.54% Korea LNG 5% Mitsubishi 2.77% Mitsui 2.77% Itochu 0.92%			<ul style="list-style-type: none"> <li>A part of Partex acquisition which was completed on 4 November 2019</li> </ul>
2	ADNOC Gas Processing (AGP)	JV	On line	2%	ADNOC 68% Shell 15% Total 15%			<ul style="list-style-type: none"> <li>A part of Partex acquisition which was completed on 4 November 2019</li> </ul>

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# Organization structure

Ensuring transparency, integrity and good corporate governance



Ratio	Formula
Lifting Cost (\$/BOE)	$(\text{Operating Exp.} - \text{Transportation Cost} - \text{Stock Variation} - \text{Other expenses not related to lifting}) / \text{Production Volume}$
Cash Cost (\$/BOE)	$(\text{Operating Exp.} + \text{Exploration Exp.} + \text{G\&A} + \text{Royalties} + \text{Finance Cost}) / \text{Sales Volume}$
Unit Cost (\$/BOE)	$(\text{Operating Exp.} + \text{Exploration Exp.} + \text{G\&A} + \text{Royalties} + \text{Finance Cost} + \text{DD\&A}) / \text{Sales Volume}$
Reserves Replacement Ratio	$5\text{-Yr Additional Proved Reserves} / 5\text{-Yr Production Volume}$
Reserves Life Index (Year)	$\text{Proved Reserves} / \text{Production Volume}$
Success Ratio	$\text{Number of wells with petroleum discovery} / \text{Total number of exploration and appraisal wells}$
Sales Revenue	$\text{Sales} + \text{Revenue from pipeline transportation}$
EBITDA	$(\text{Sales} + \text{Revenue from pipeline transportation}) - (\text{Operating expenses} + \text{Exploration expenses} + \text{Administrative expenses} + \text{Petroleum royalties and remuneration} + \text{Management's remuneration})$
EBITDA Margin	$\text{EBITDA} / \text{Sales Revenue}$
Return on Equity	$\text{Trailing-12-month net income} / \text{Average shareholders' equity between the beginning and the end of the 12-month period}$
Return on Capital Employed	$(\text{Trailing-12-month net income} + \text{Trailing-12-month Interest Expenses \& Amortization of Bond Issuing Cost}) / (\text{Average shareholders' equity and average total debt between the beginning and the end of the 12-month period})$
Simple Effective Tax Rate	$\text{Income tax expenses} / \text{Income before income taxes}$
Total debt	$\text{Short-term loans from financial institution} + \text{Current portion of long-term debts} + \text{Bonds} + \text{Long-term loans from financial institution}$
Net debt	$\text{Total debt} - \text{Liquidity}$
Debt to Equity	$\text{Total debt} / \text{Shareholders' equity}$
Net Debt to Equity	$\text{Net debt} / \text{Shareholders' equity}$
Total Debt to Capital	$\text{Total debt} / (\text{Total debt} + \text{Shareholders' equity})$
Total Debt to EBITDA	$\text{Total debt} / \text{Trailing-12-month EBITDA}$
Net Debt to EBITDA	$\text{Net debt} / \text{Trailing-12-month EBITDA}$
EBITDA Interest Coverage Ratio	$\text{Trailing-12-month EBITDA} / \text{Trailing-12-month Interest Expenses \& Amortization of Bond Issuing Cost}$