PTTEP

35th ENERGY PARTNER OF CHOICE

Investor Presentation

CLSA – Group Conference Call

19 March 2020

Disclaimer

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.

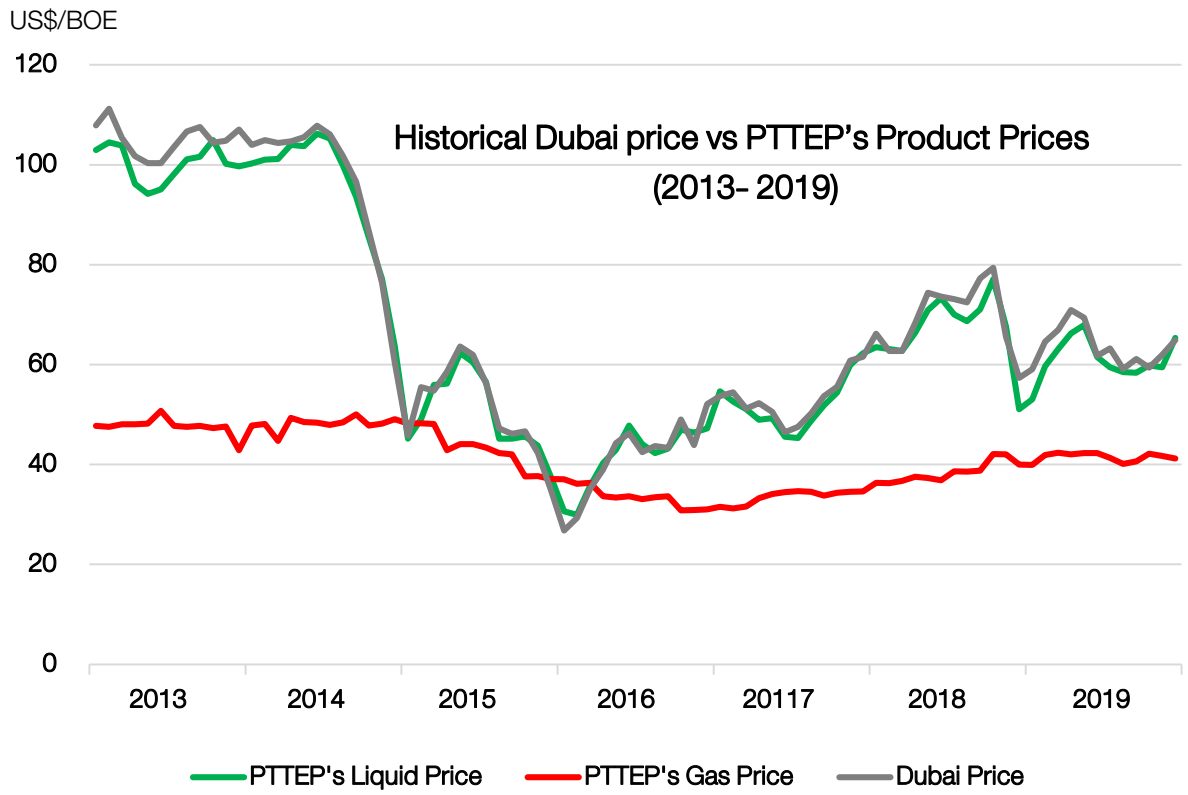
This presentation may contain the terms "proved reserves" and "probable reserves". Unless stated otherwise, the Company adopts similar description as defined by the Society of Petroleum Engineers.

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.

Oil Price volatility and its impact to PTTEP

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 unit cost around 32 $/BOE and 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

- **Revisit Investment Plan**: Prioritize CAPEX and OPEX while maintaining production volume as planned

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2019 Highlights

Strategy and Growth

Financial Performance

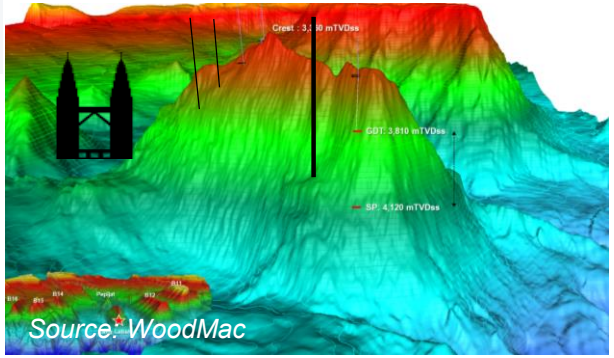
2019 KEY ACHIEVEMENTS

351 KBOED

"PTTEP records the highest sales volume of all time at 351 KBOED in 2019"

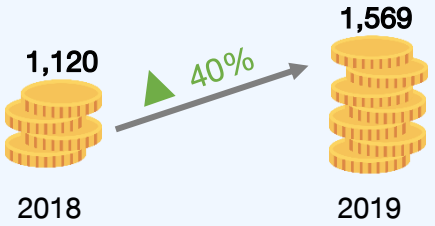
WORLD's 7th

Largest gas discovery in 2019 from Lang Lebah well, Project SK410B offshore Sarawak, Malaysia



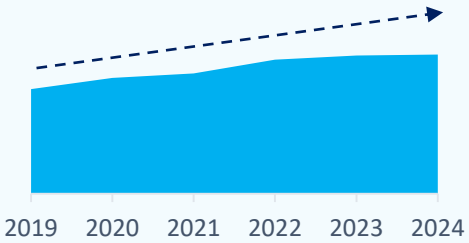
1,569 MM$

71% EBITDA Margin



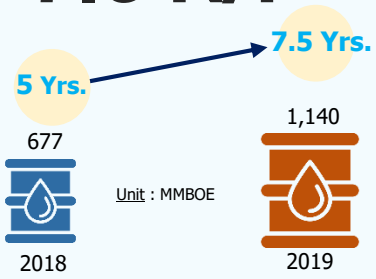
PTTEP reported net income of 1,569 MMUSD, an increase of 40% compared to the previous year, with healthy EBITDA margin of 71%.

6% CAGR



Expected Sale Volume

7.5 R/P



Reserves Life

3 Awards

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

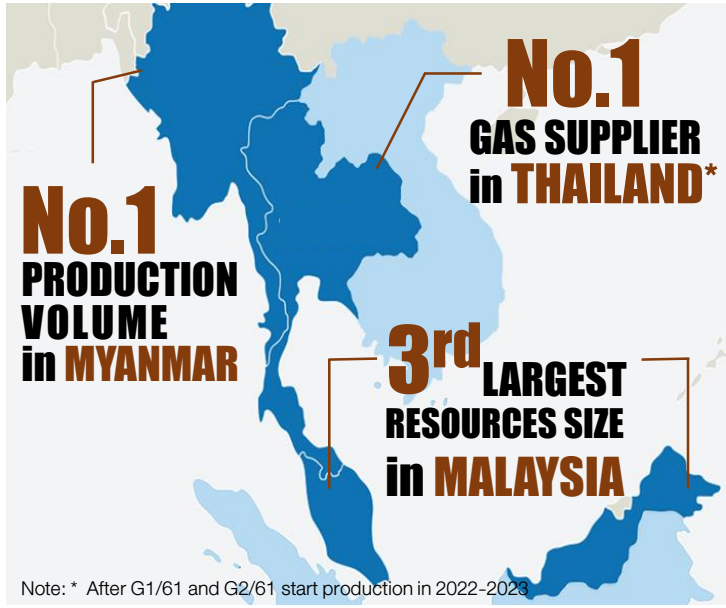
3 M&As

- 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

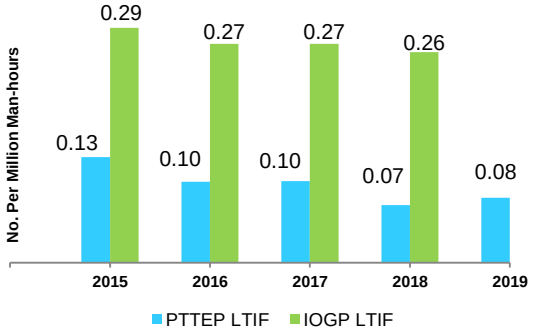
Note: FID : Final Investment Decision
R/P : Proved Reserves / Production



Note: * After G1/61 and G2/61 start production in 2022-2023

Safety Target ZERO

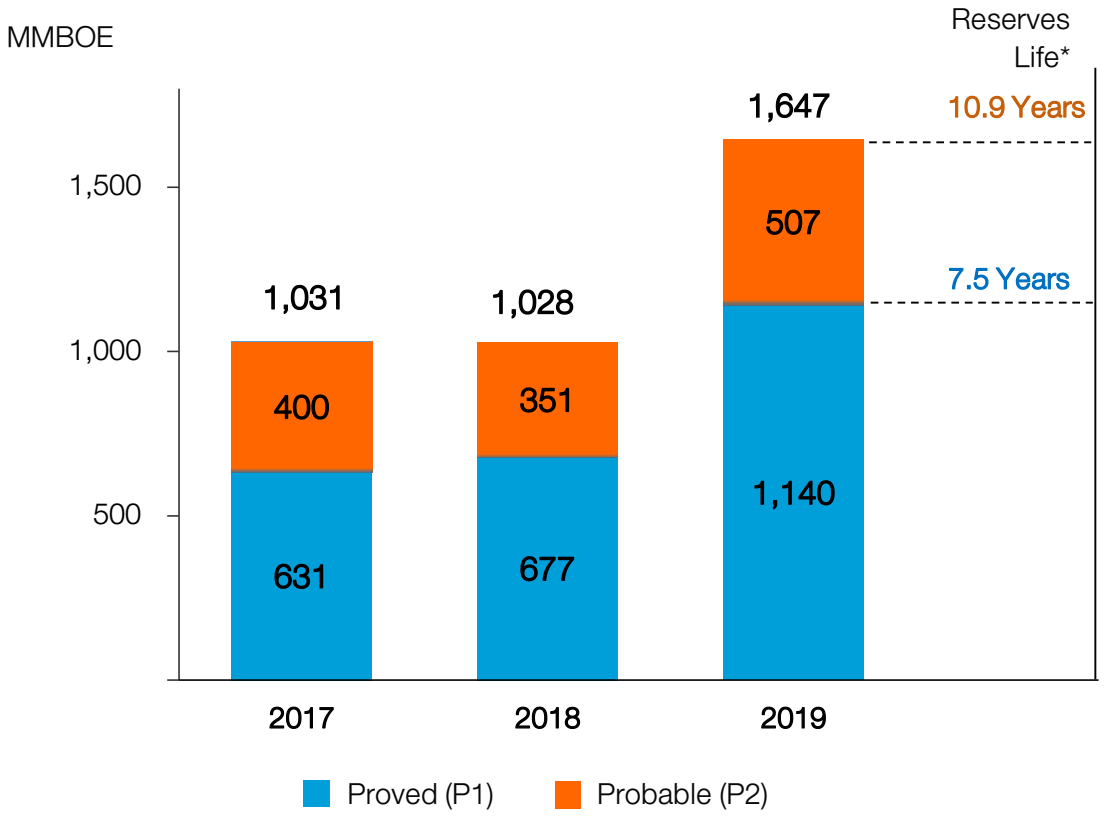
Below Industry Standard



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

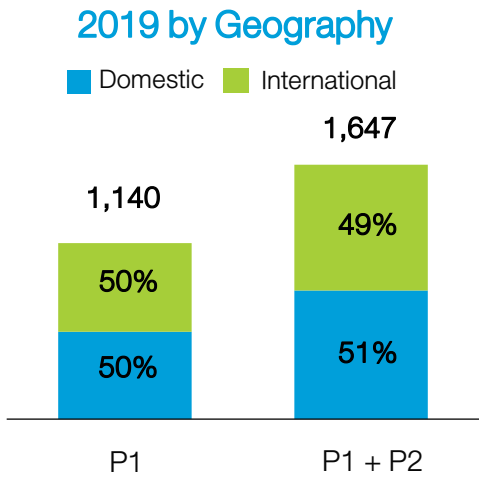
Reserves at the Year-end 2019

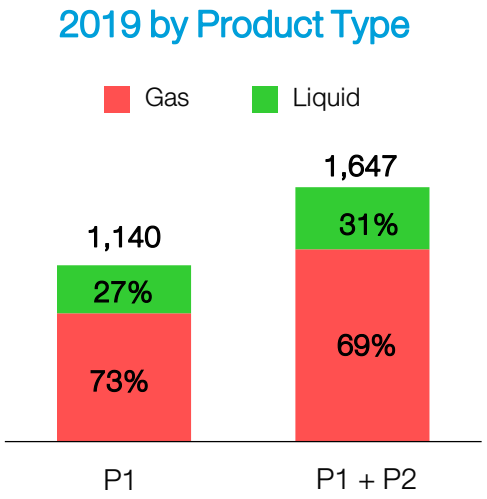
Significantly improved reserve life to over 7 years



5-Year Average Proved Reserves Replacement Ratio (RRR)

2017	2018	2019
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

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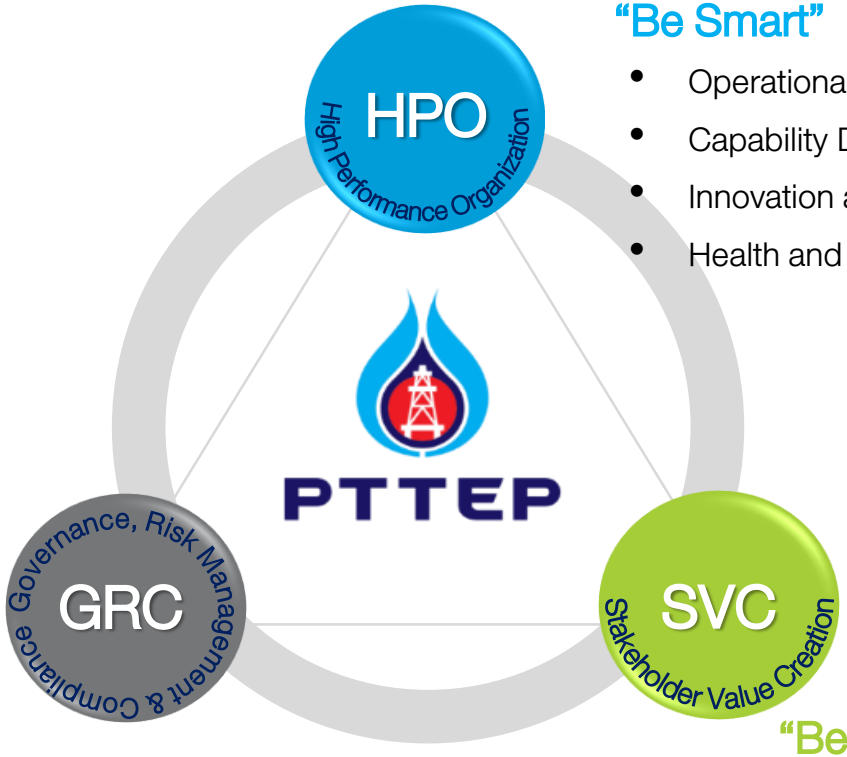
2019 Highlights

Strategy and Growth

Financial Performance

Driving towards Sustainability



"Be Smart"

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

"Be Good"

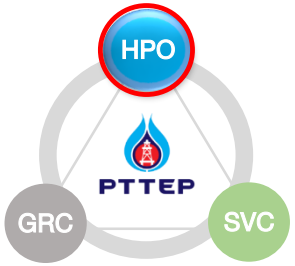
- Conducting business with accuracy, transparency, fairness
- Strict compliance with laws and regulations
- Good governance and appropriate risk management

"Be responsible"

- GHG* Reduction
- Contribution to Society
- Environmental Management

Note: *Greenhouse Gas

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 1st gas for Block H in 2020

Newly Acquired Assets from Partex:
Maintain sales volume

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

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

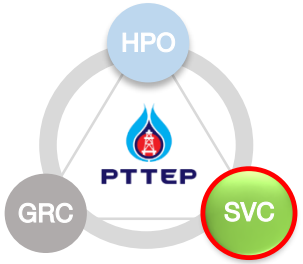
Full Value Creation on Existing Assets

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

Stakeholder Value Creation



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

Governance, Risk Management & Compliance

GRC Baseline Application to:

- Global Operations & Newly acquired assets
- Suppliers & Contractors

How do we ensure GRC?

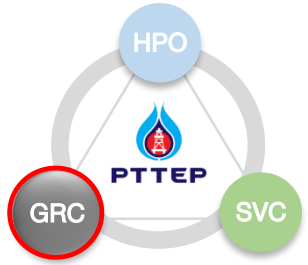
Policy
- Good Corporate Governance and Business Ethics
- Regulations and Policies for operations

Governing Body
- Board of Directors
- Sub-committees e.g. Risk Management Committee, Audit Committee and CG Committee

Awareness
- Policy, plan & process Communication
- Trainings

Control/ Audit
- 3 Lines of Defense
- Control Self-Assessment (CSA)
- External Assessment by independent organizations

Whistle-blowing
- CG Hotline



Anti corruption

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

NO GIFT POLICY

EITI Extractive Industries Transparency Initiative

UN GLOBAL COMPACT

CAC PRIVATE SECTOR COLLECTIVE ACTION AGAINST CORRUPTION

Human rights

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

UN GLOBAL COMPACT

IPIECA

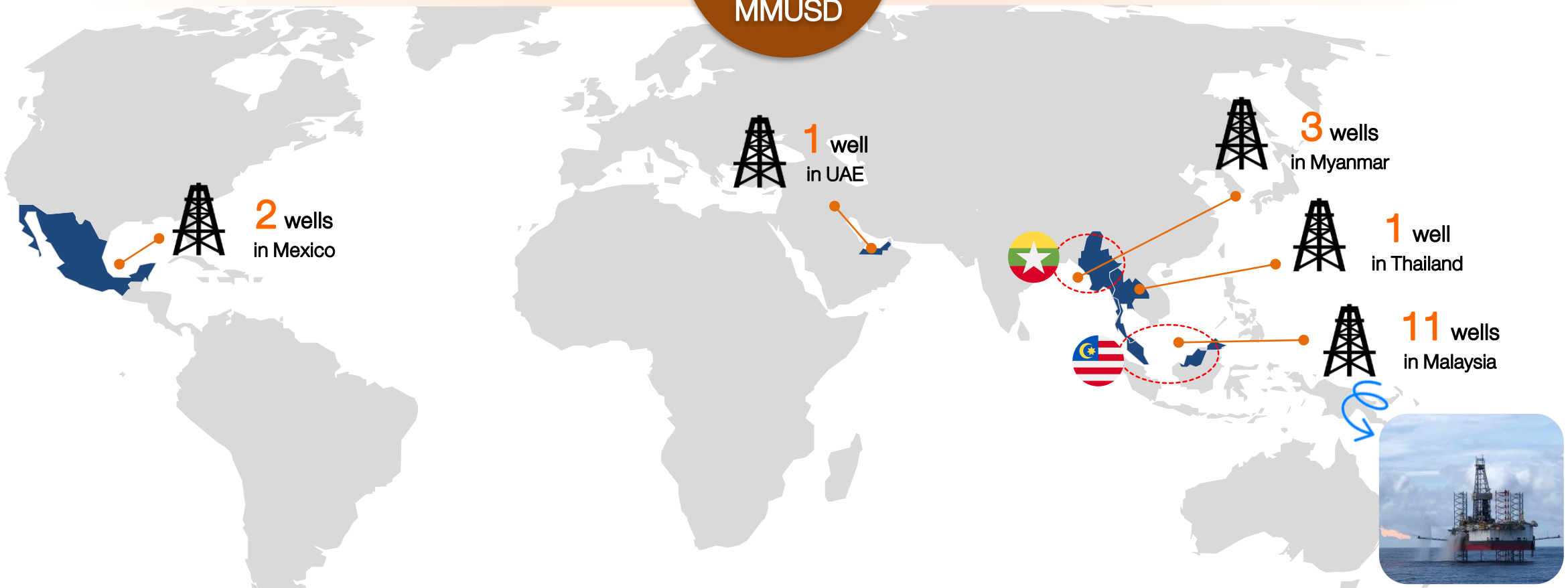
Exploration Plan in 2020

Accelerate Exploration activities mainly in Malaysia

CAPEX
281 MMUSD

2020 Budget
343
MMUSD

OPEX
62 MMUSD



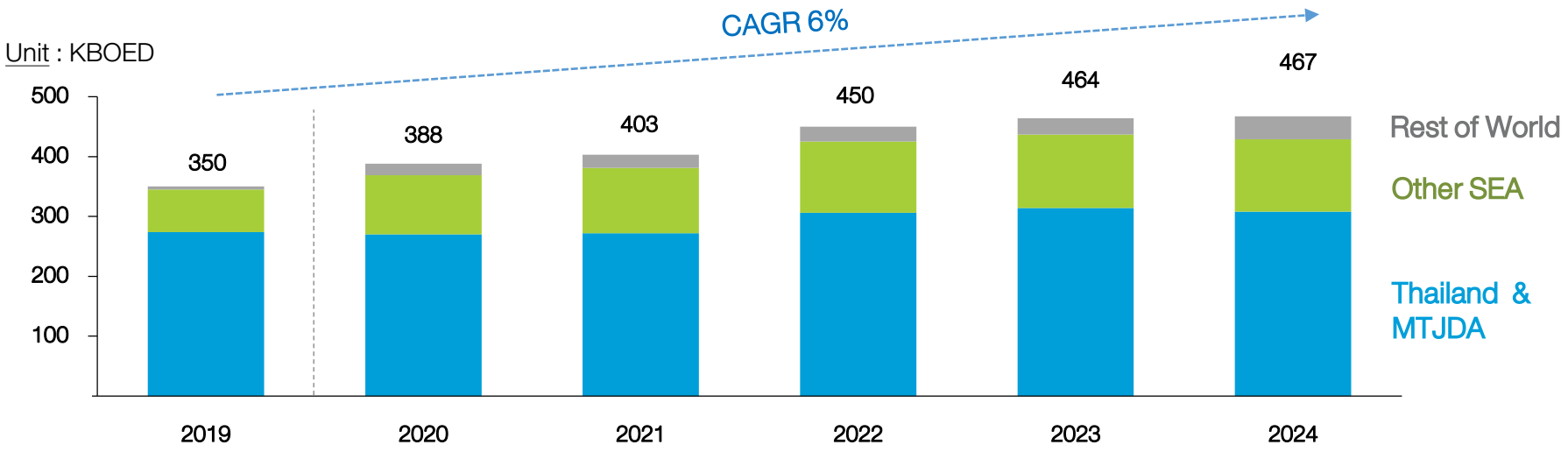
SK410B: *Largest Exploration Discovery field of PTTEP History*

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

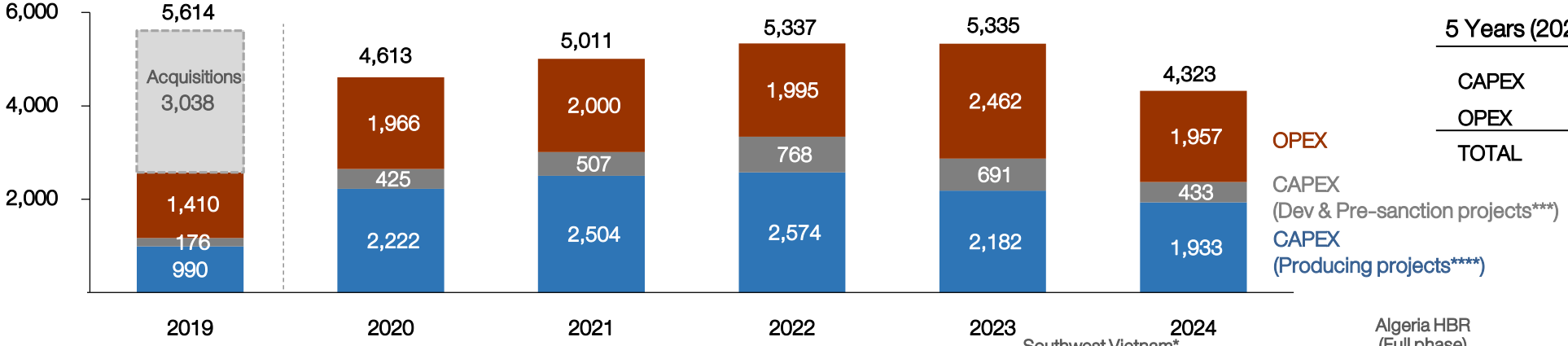
Five –Year Plan

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

Sales Volume



Investment



5 Years (2020 – 2024)	
CAPEX	14,239
OPEX	10,380
TOTAL	24,619

Key Project Start-up

- Sabah H — Capacity 270 MMSCFD
- Algeria HBR (phase I) — Capacity 10-13 KBPD
- G1/61** — Capacity 800 MMSCFD; G2/61** — Capacity 200 MMSCFD (April 2022)
- G2/61** — Capacity 700 MMSCFD (March 2023)
- Southwest Vietnam* — Capacity 490 MMSCFD
- Mozambique LNG — Capacity 12.88 MTPA
- Algeria HBR (Full phase) — Capacity 50 KBPD
- SK410B* — Initial Capacity 300-500 MMSCFD

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

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2019 Highlights

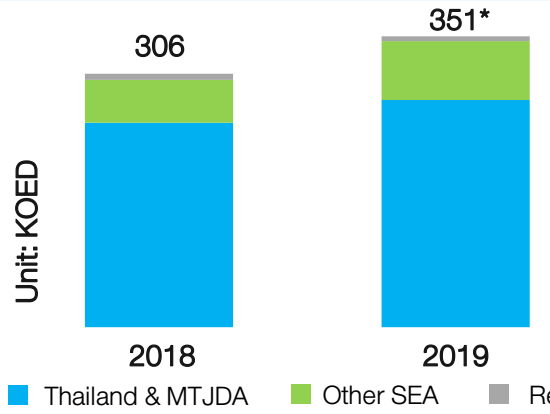
Strategy and Growth

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 Cost

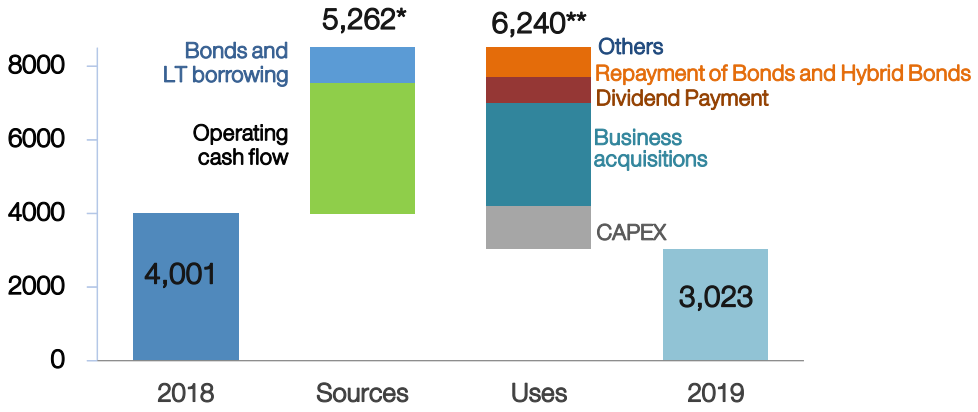
Unit : $/BOE	2018	2019
Cash cost	15.11	15.88
Non-Cash cost	16.58	15.83
Unit cost	31.69	31.71

Unchanged

Remain competitive unit cost

Note: Unit Cost : Exclude costs related to new business

2019 Source & Use of Funds

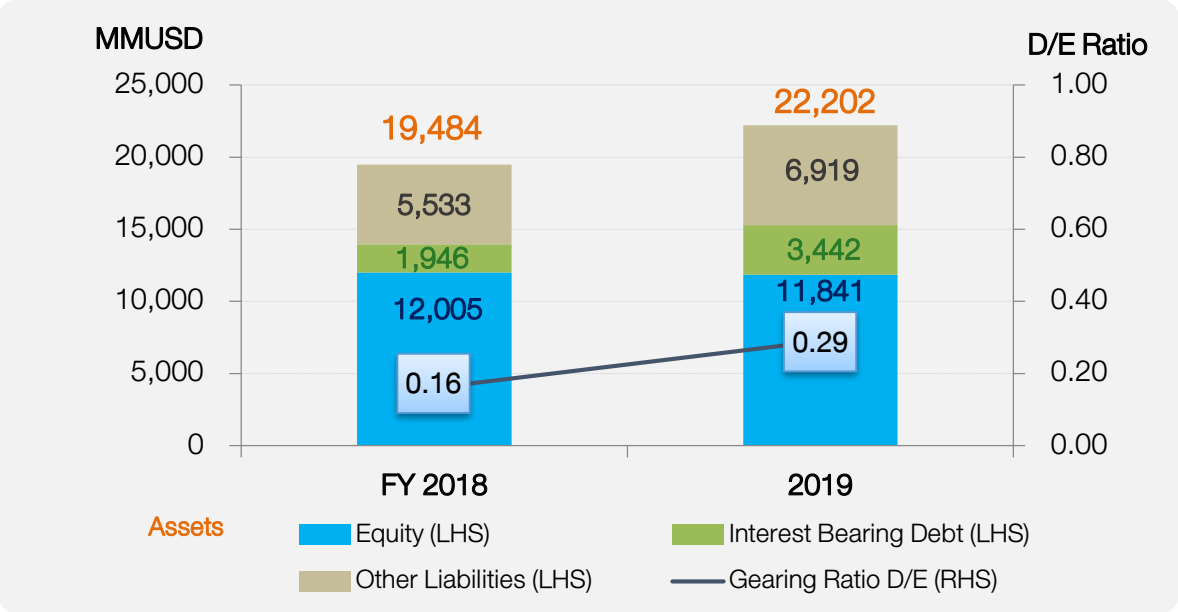


Remark: * Net of adjustment for the effect of exchange rate changes on cash and cash equivalents
** Excludes cash flows for investing in short-term investments (Fixed deposit > 3 months)

Financial Position and Dividends

Capital Structure

Healthy balance sheet at competitive leverage level

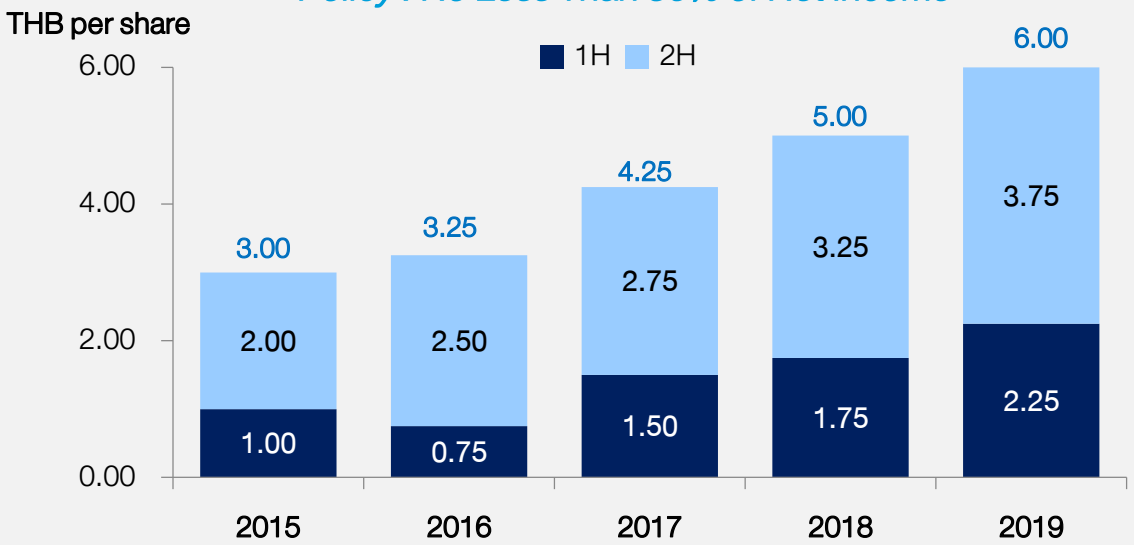


Debt Profile	US$ 100%	US$ 100%
Weighted Average Cost of Debt (%)	5.32	**4.41**
[Fixed : Floating]	[100 : 0]	**[82 : 18]**
Average Loan Life (Years)	8.67	**13.84**

Remark: Debt profile excludes Hybrid bonds

Dividend Payment History

Policy : No Less Than 30% of Net Income



	2015	2016	2017	2018	2019
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

Outlook & Takeaways

2020 Guidance

Continue volume growth base with operational efficiency

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

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Thank you and Q&A

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

+66 2 537 4000

http://www.pttep.com

IR@pttep.com

Supplementary information

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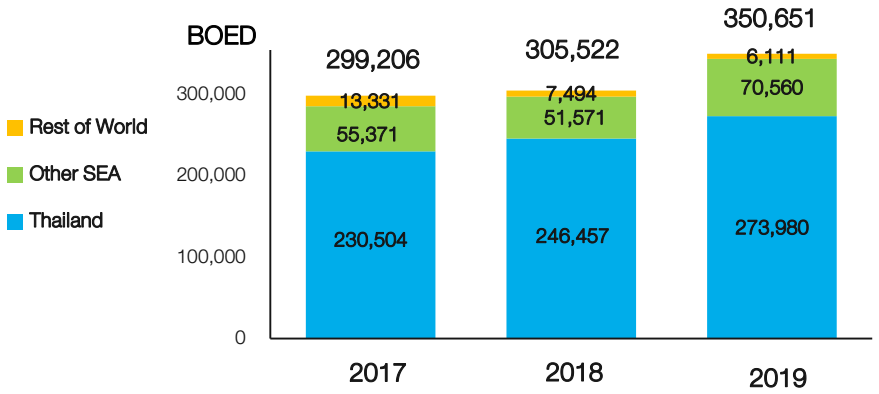
- Ratio and Formula 50

Sales Volume & Unit Cost

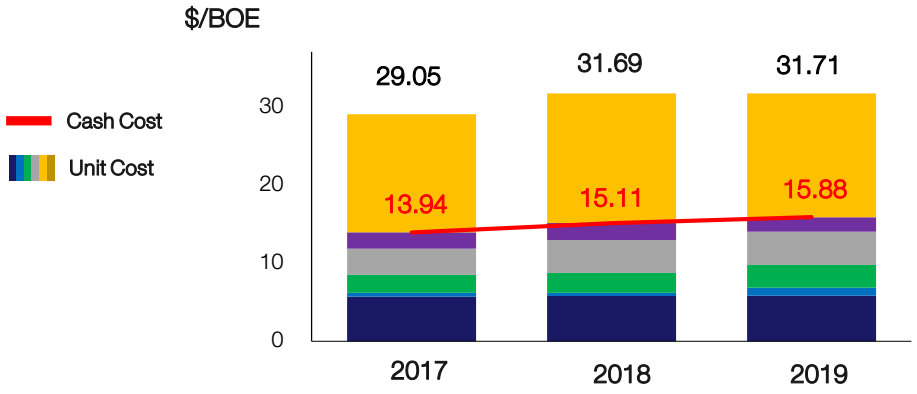
Upward sales volume after completion of acquisitions with competitive cost

Sales Volume and Price



	2017	2018	2019
Gas ($/MMBTU)	5.59	6.42	6.92
Liquid ($/BBL)	52.26	67.40	61.18
Weighted Avg. ($/BOE)	39.20	46.66	47.24
Avg. Dubai ($/BBL)	53.14	69.65	63.51
Avg. HSFO ($/BBL) (High Sulphur Fuel Oil)	49.64	67.01	58.60
Volume Mix *(Gas : Liquid)*	70 : 30	72 : 28	71 : 29
Revenue Mix *(Gas : Liquid)*	60 : 40	59 : 41	62 : 38

Unit Cost



	2017	2018	2019
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
Lifting Cost	4.19	4.33	4.31

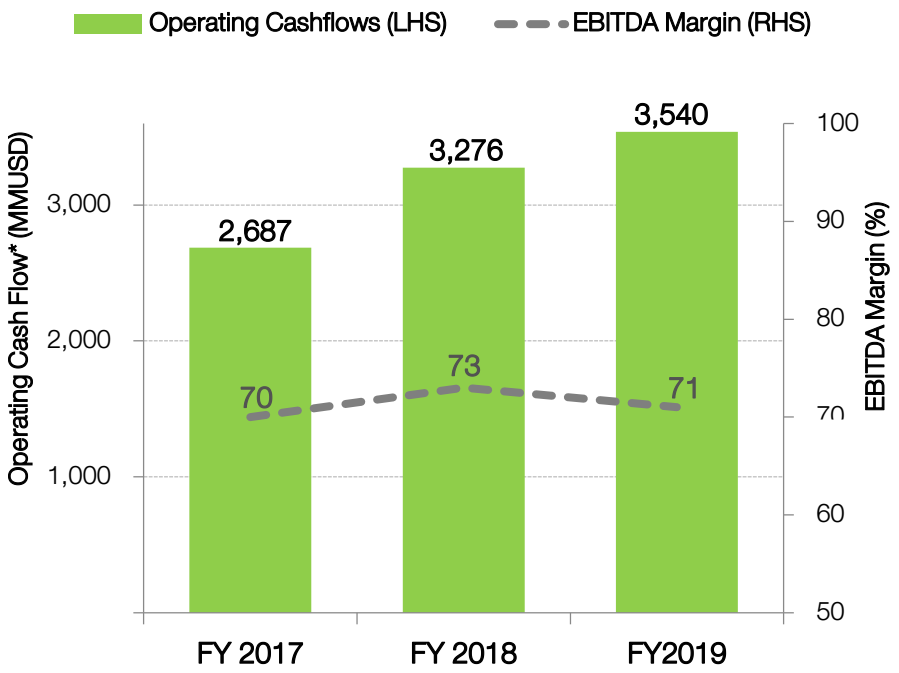
Note: * Exclude costs related to new business

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

Cash Flow Performance

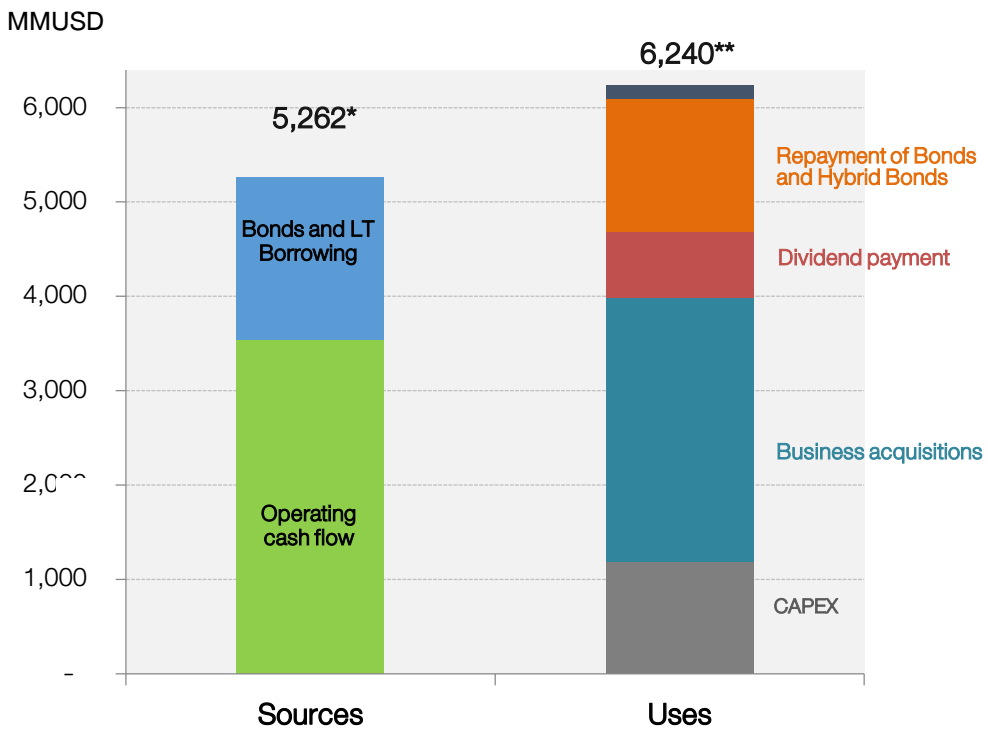
Robust operating cash flow

Cash Flow Performance



Net Income	594	1,120	**1,569**
Recurring Net Income***	836	1,215	**1,445**

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
Key Financial Ratios					
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
Key Financial Ratios		
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

Operating	3,540
▪ Income before tax & non-cash adjustment	4,623
▪ Tax payment	(927)
▪ Changes in assets/liabilities*	(156)

EBITDA 4,354 MMUSD

+

CAPEX & Investment	(3,985)
▪ CAPEX (PP&E, Intangible asset)	(1,208)
▪ Business acquisitions	(2,793)
▪ Others	16

Free Cash Flow
(445)

+

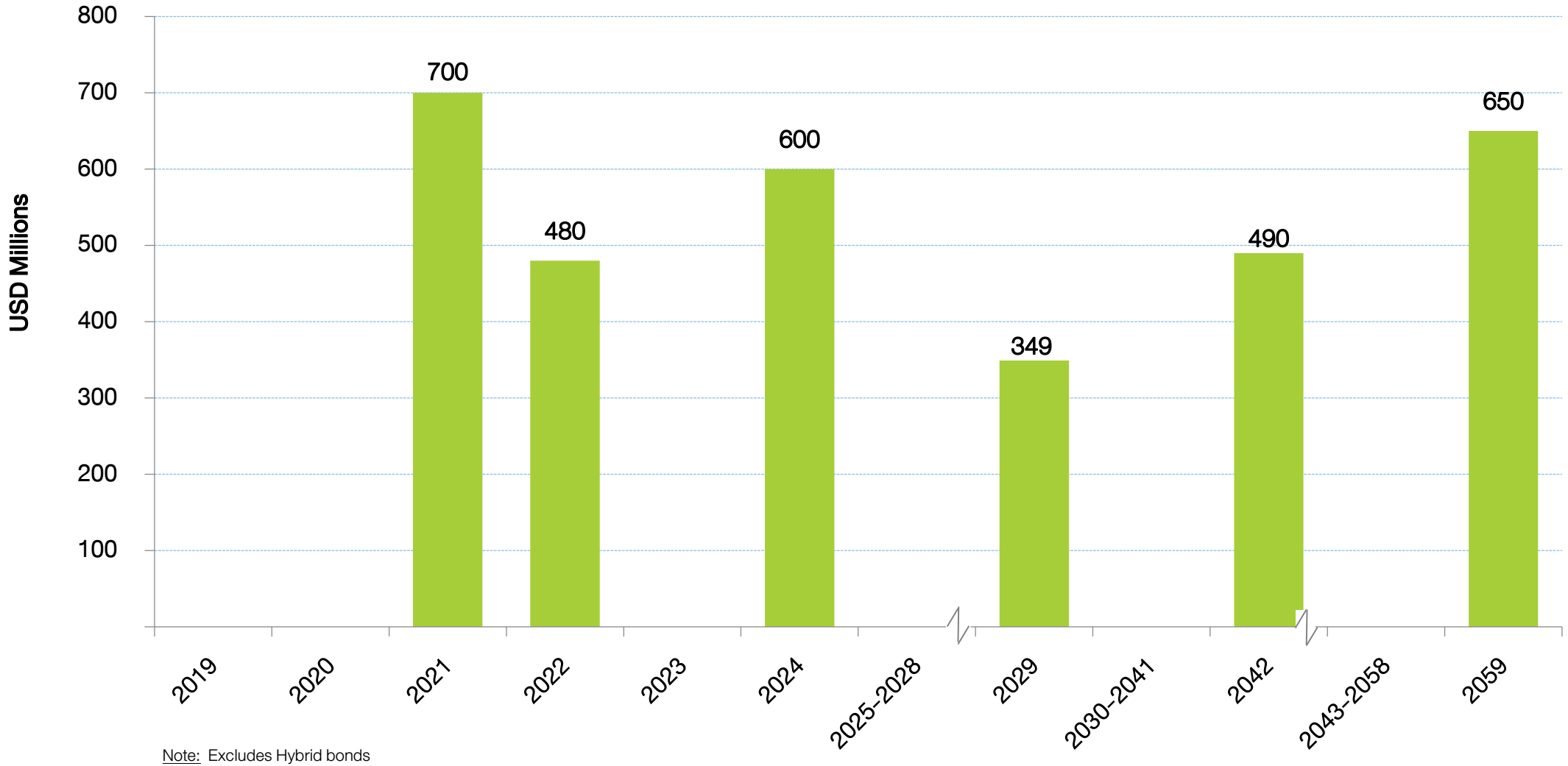
Finance	(533)
▪ Repayment of Bonds and Subordinated capital debentures	(1,417)
▪ Bonds and Long term borrowing	1,722
▪ Dividend payment	(698)
▪ Interest and finance cost paid**	(143)
▪ Others	3

Cash In (Out)	+	Beginning Cash & Cash Equivalent***	=	Ending Balance***
(978)		4,001		3,023

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

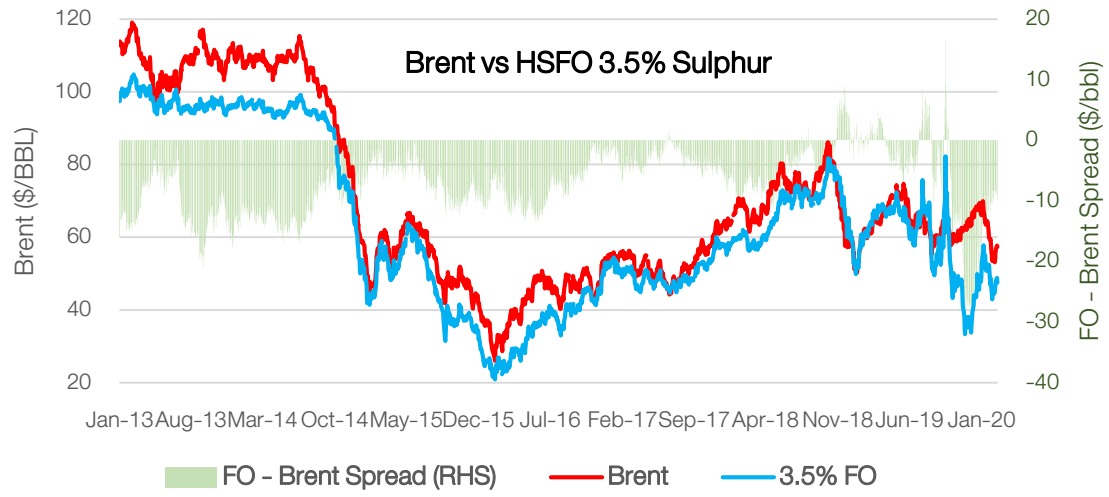
Unit: USD Millions or equivalent after cross currency swap

Industry Trends: IMO2020 Implications

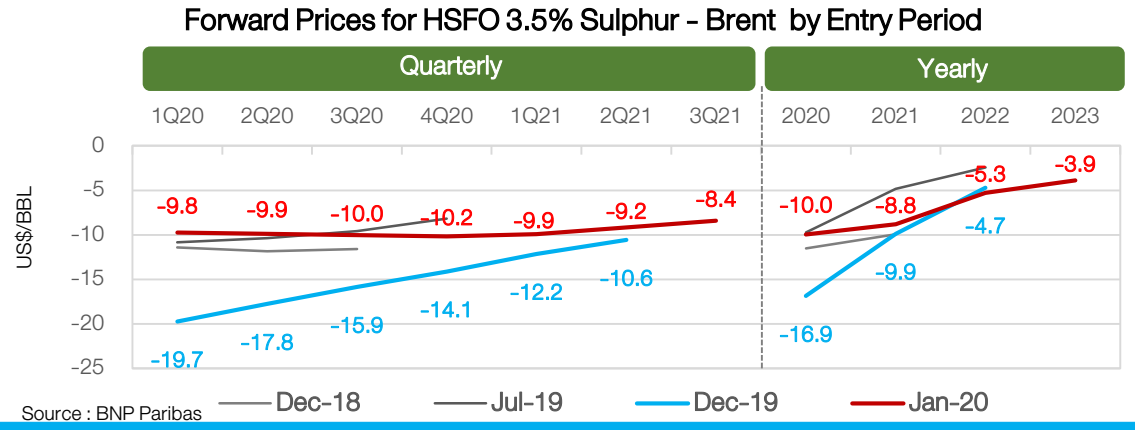
Minor impact to PTTEP's performance

HSFO : Historical & Forward

Historically, HSFO-Brent Spread has been volatile

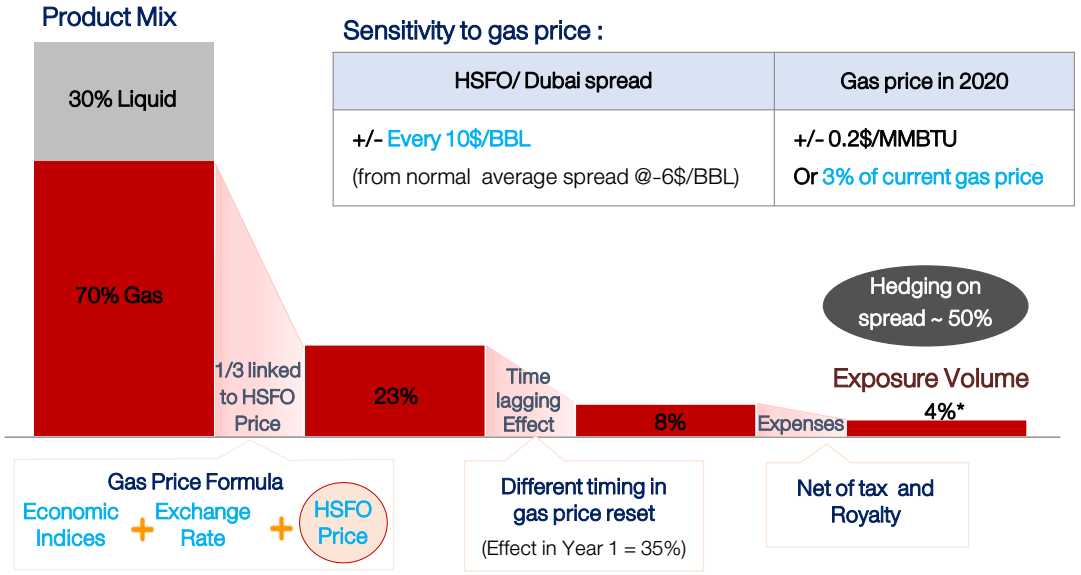


Industry Rebalancing, expected within 1-2 years



Source : BNP Paribas

Impact and Mitigations



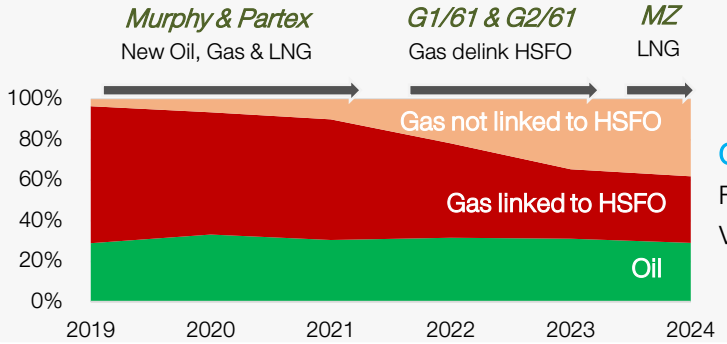
Sensitivity to gas price :

HSFO/ Dubai spread	Gas price in 2020
+/- Every 10$/BBL (from normal average spread @-6$/BBL)	+/- 0.2$/MMBTU Or 3% of current gas price

Note: *Exposure Volume in 2020 Only

Long term effect :

PTTEP's Gas/Liquid Sales Proportion Forecast



Gas Sales Delink from HSFO

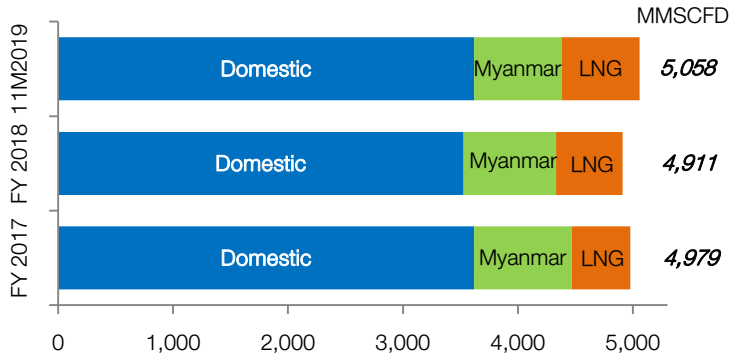
From 70% to 30% of Total Sales Volume in 2024

Thailand Updates

Domestic gas volume suppressed by LNG import; Expected THB appreciation continues

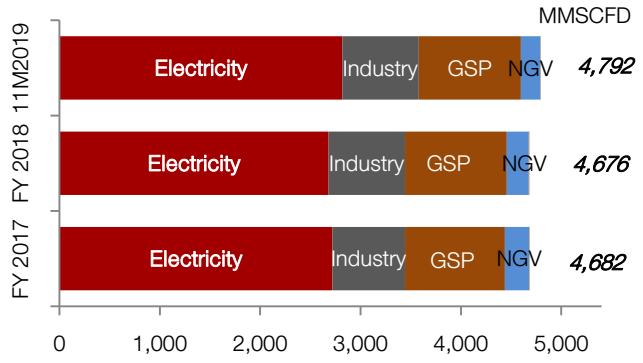
Thailand Energy Overview

Natural Gas Supply



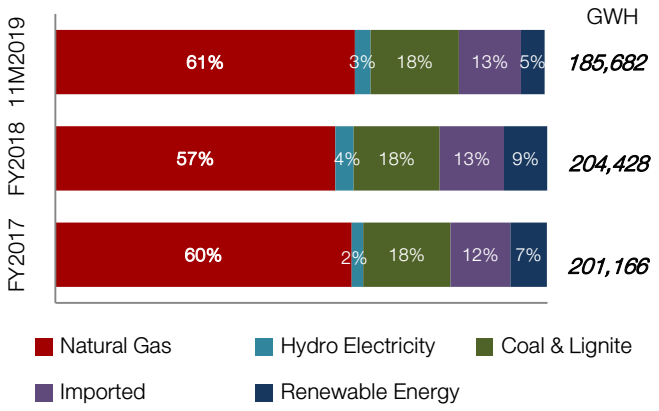
Slight decline from Myanmar piped gas imports due to natural decline and significant growth in LNG import

Natural Gas Consumption

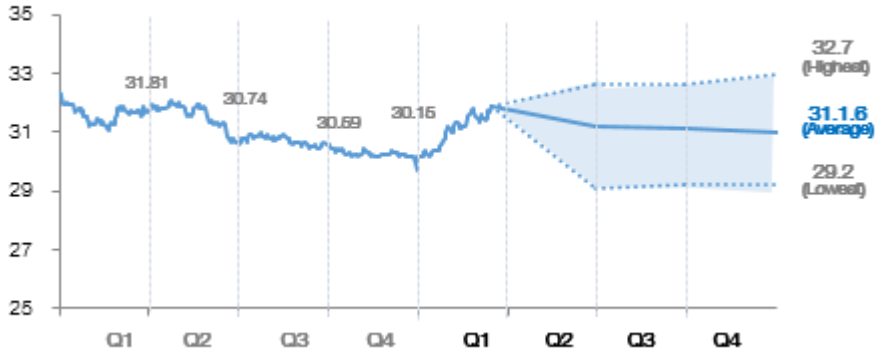


Source: EPPO

Electricity Generation



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

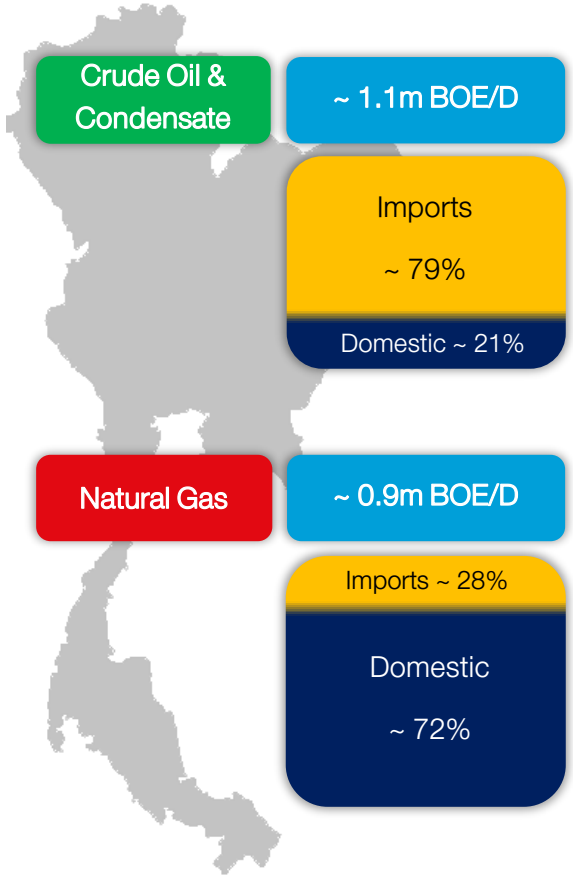
Source: Bank of Thailand, Bloomberg

Forecast based on Bloomberg Consensus as of 16 March 2020

Thailand's Energy Value Chain

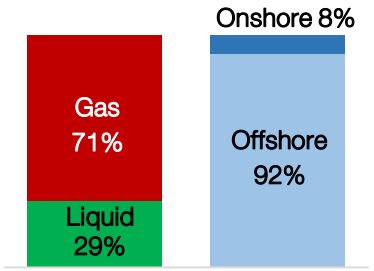
PTTEP contributes almost 1/3 of Thailand's petroleum production

11M Thailand's Oil and Gas Demand

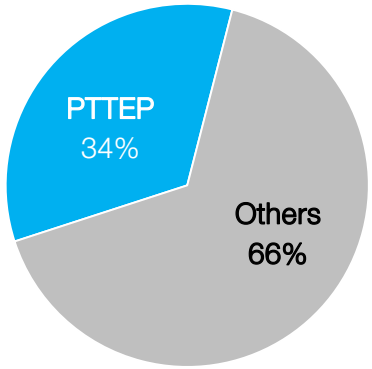


12M2019 Thailand Petroleum Production

% by Petroleum Type and Area



% Production by Company



Midstream

Gas: operated by PTT

- Transmission Pipelines
- Gas Separation Plants

Oil: PTT participates through subsidiaries

- Refineries

Downstream

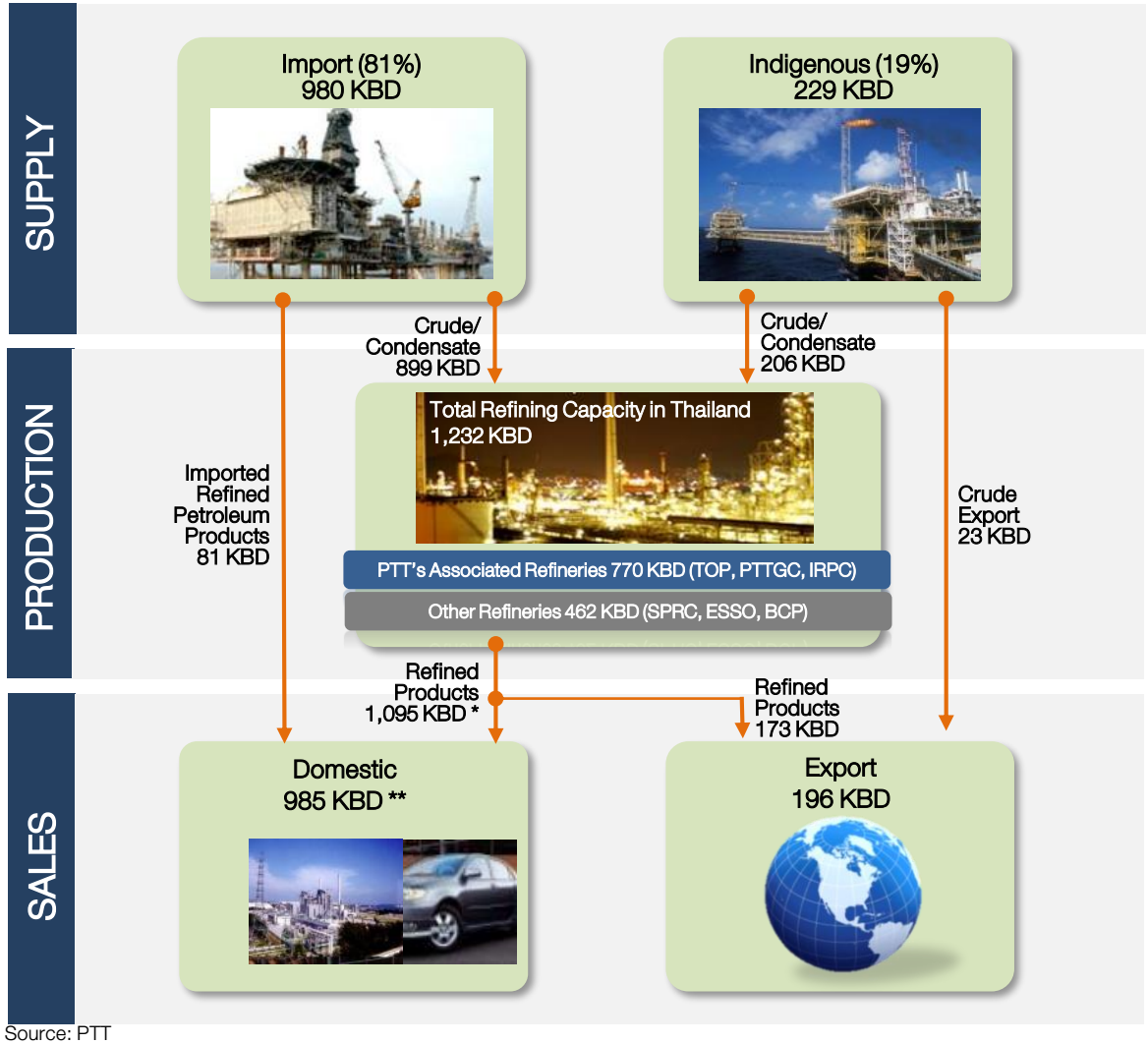
- Petrochemicals
- Oil and gas marketing

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

Thailand's Oil and Gas Balance

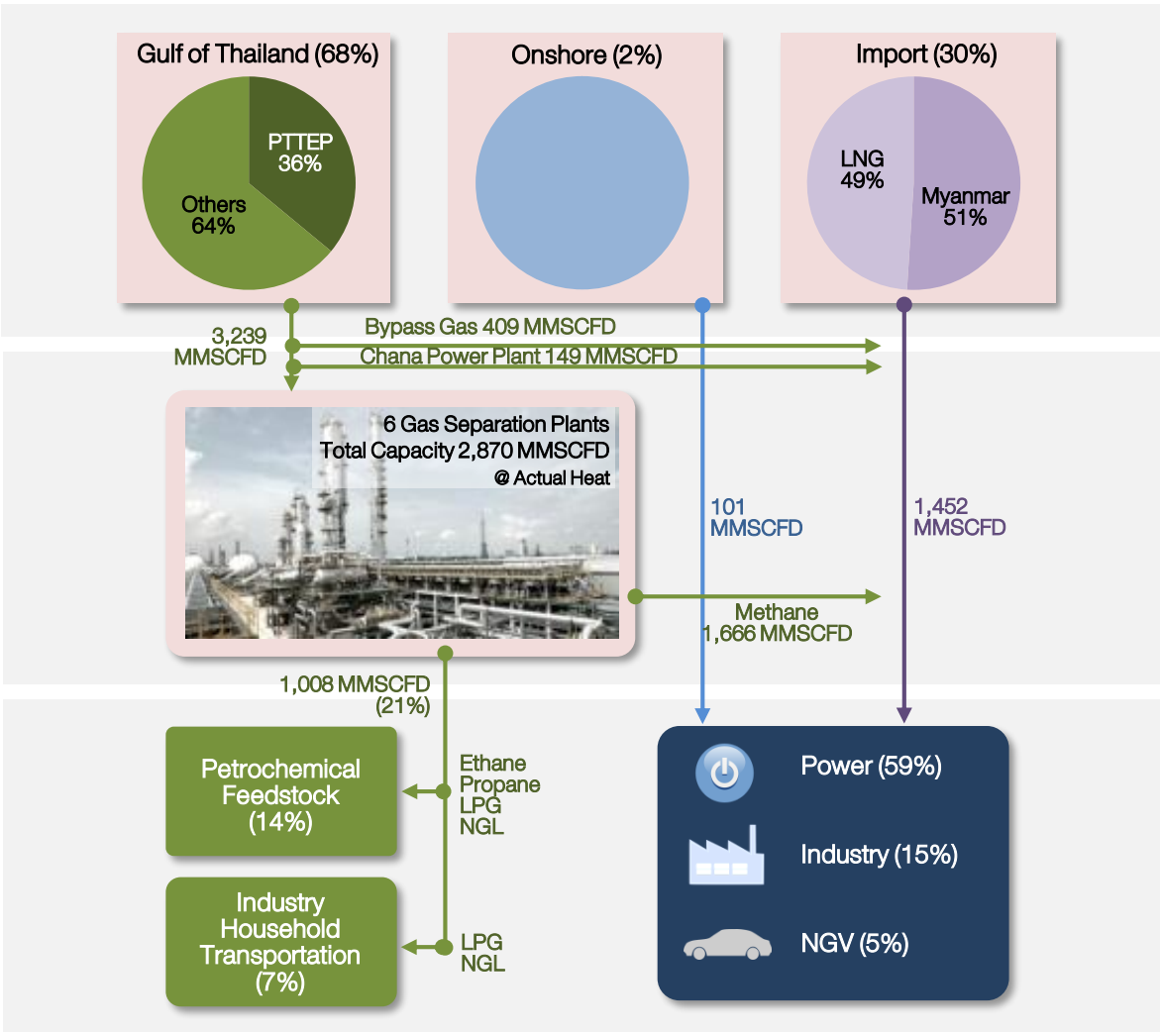
Oil Balance***

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^3

Sustainable development

Pursue long-term growth with social and environmental wellness

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 6th consecutive year and the 2nd time as industry leader in the DJSI World Oil and Gas Upstream & Integrated Industry

PTTEP

FTSE4Good

FTSE4Good Emerging Index 2019

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

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)

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)

Diversified international portfolio

Central Asia

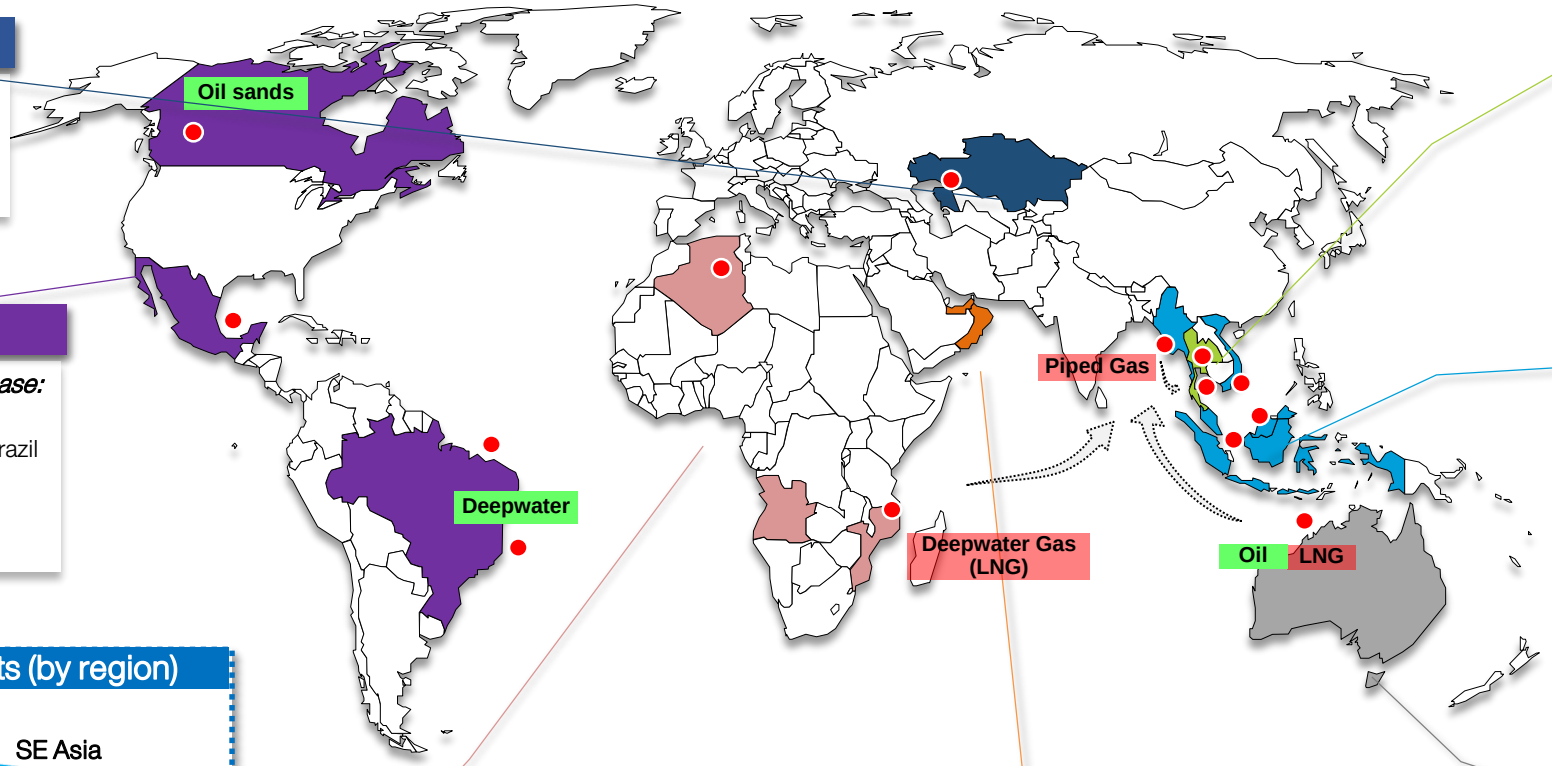
First presence in Kazakhstan:

- 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



Thailand

PTTEP's core production base

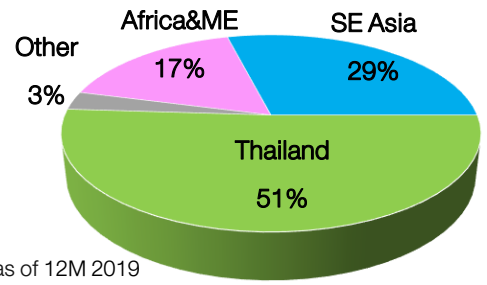
- 78% of total sales volume
- Key producing assets include Bongkot, Arthit, Contract 4 and S1
- Bongkot (G2/61) and Erawan (G1/61) are in transition process to ensure production continuity

Southeast Asia

Second heartland to PTTEP

- 20% of total sales volume mainly from Malaysia and Myanmar
- 3rd 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)

Book Value of Assets (by region)



as of 12M 2019

Total Assets USD 22.2 billion

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

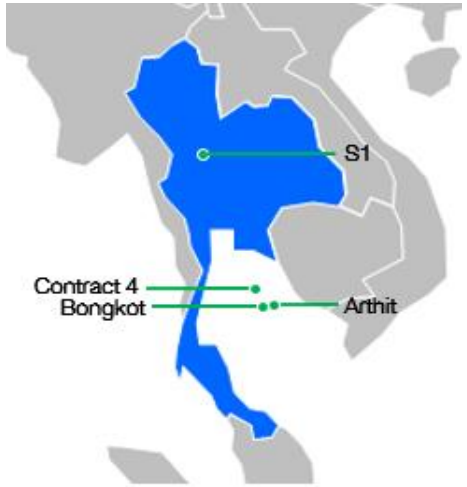
Potential gas development

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

Thailand, Myanmar and Malaysia

"Coming Home" to maintain strong foundation with full expertise

Thailand



● Production / Ramp-up Projects

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)*

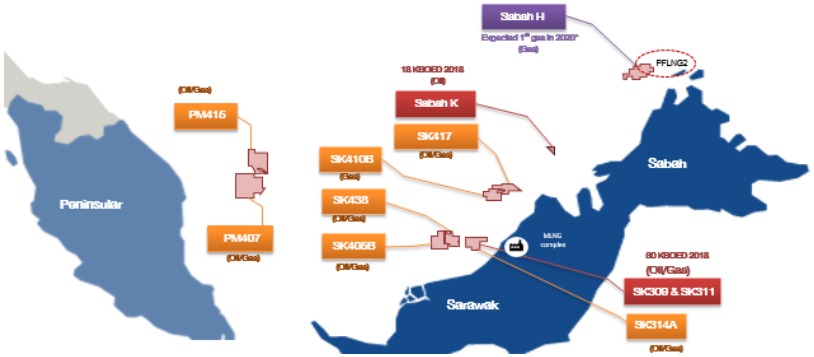
- Average sales rate of 409 MMSCFD for natural gas and 18 KBPD for condensate in 12M2019

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

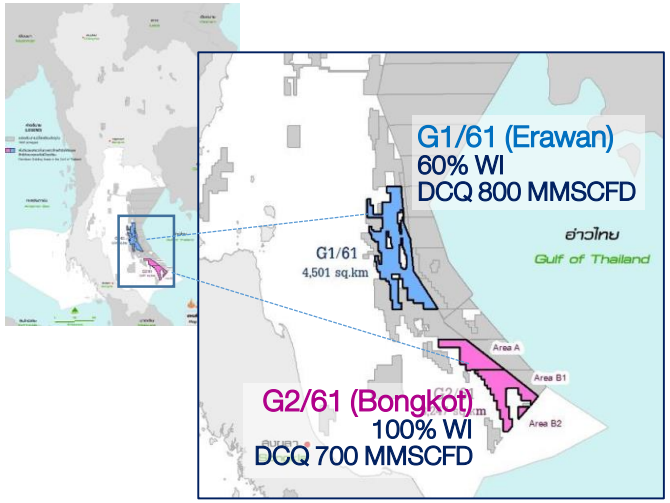
**This asset is a part of the acquisition of Murphy's business in Malaysia which was completed in July 2019*

*** 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

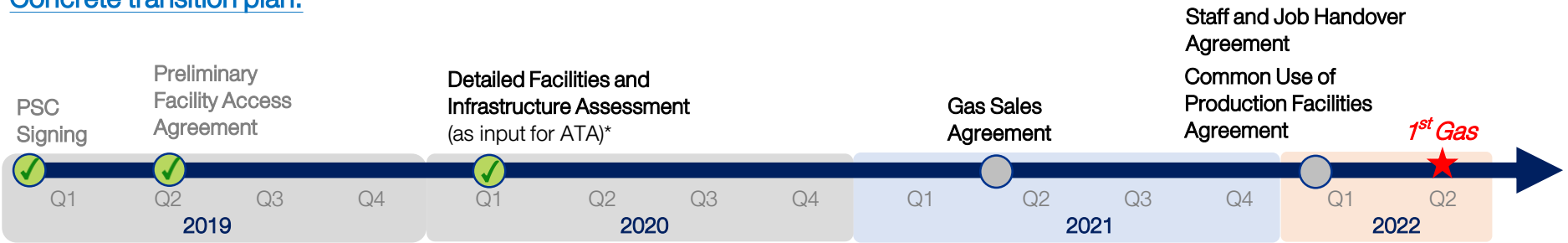
Generating strong cash flow

- 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*

	Production	Start-up
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: $Pr_{(y)} = Pc \times M_{(y)} \times \left(a\frac{PPI_{(y)}}{PPI} + \frac{I_{(y)}}{I}\left\{b\frac{OM_{(y)}}{OM} + c\frac{DB_{(y)}}{DB} + d\right\}\right)$

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

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

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

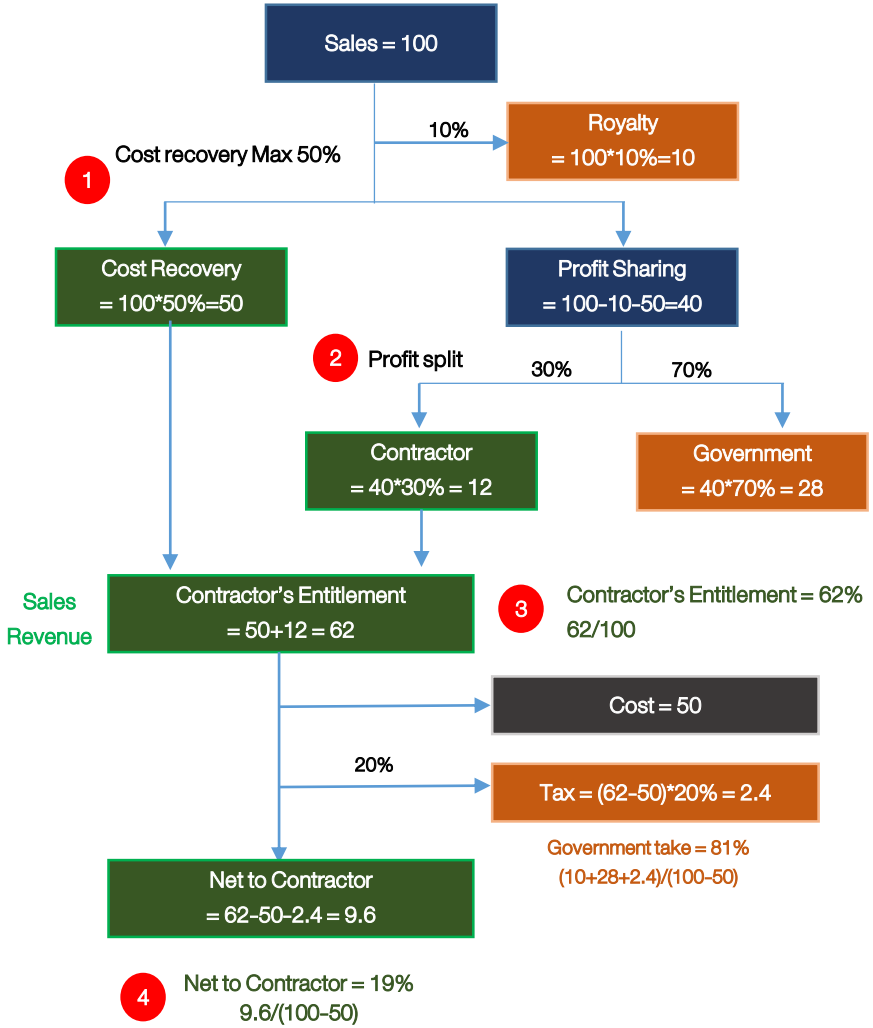
Terms

	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

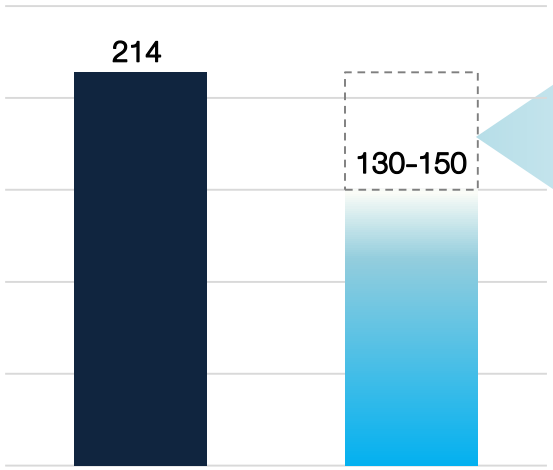
Bongkot and Erawan: Thailand Champion in Domestic Gas Supply

Achievable cost optimization to sustain target return

With new gas price, we can achieve target IRR

Gas price

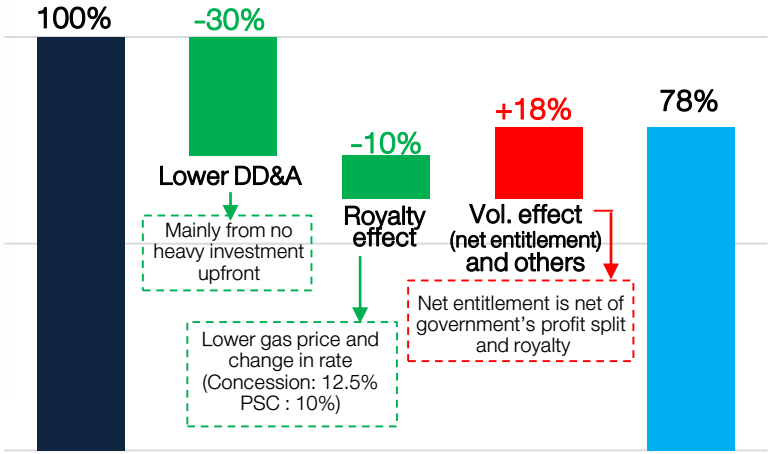
Under Price Constant of 116 THB/MMBTU,
Gas price 130-150 THB/MMBTU (Dubai 60-80 $/BBL)



Unit: THB/MMBTU

Cost optimization

Major processing facilities already in-place. Unit cost lowered by 22% through cost synergy and optimization



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

Wellhead Platform

- Lean design standardization
- Volume bundling & contracting strategy
- Platform topside and facility reuse

Drilling & Well

- Implement factory drilling
- Utilize drilling rig with GoT-fitted specifications
- Optimize drilling rig & service contracts across GoT

Logistics

- Synergy and optimize marine and aviation fleets across GoT
- Procurement strategy

Decommissioning

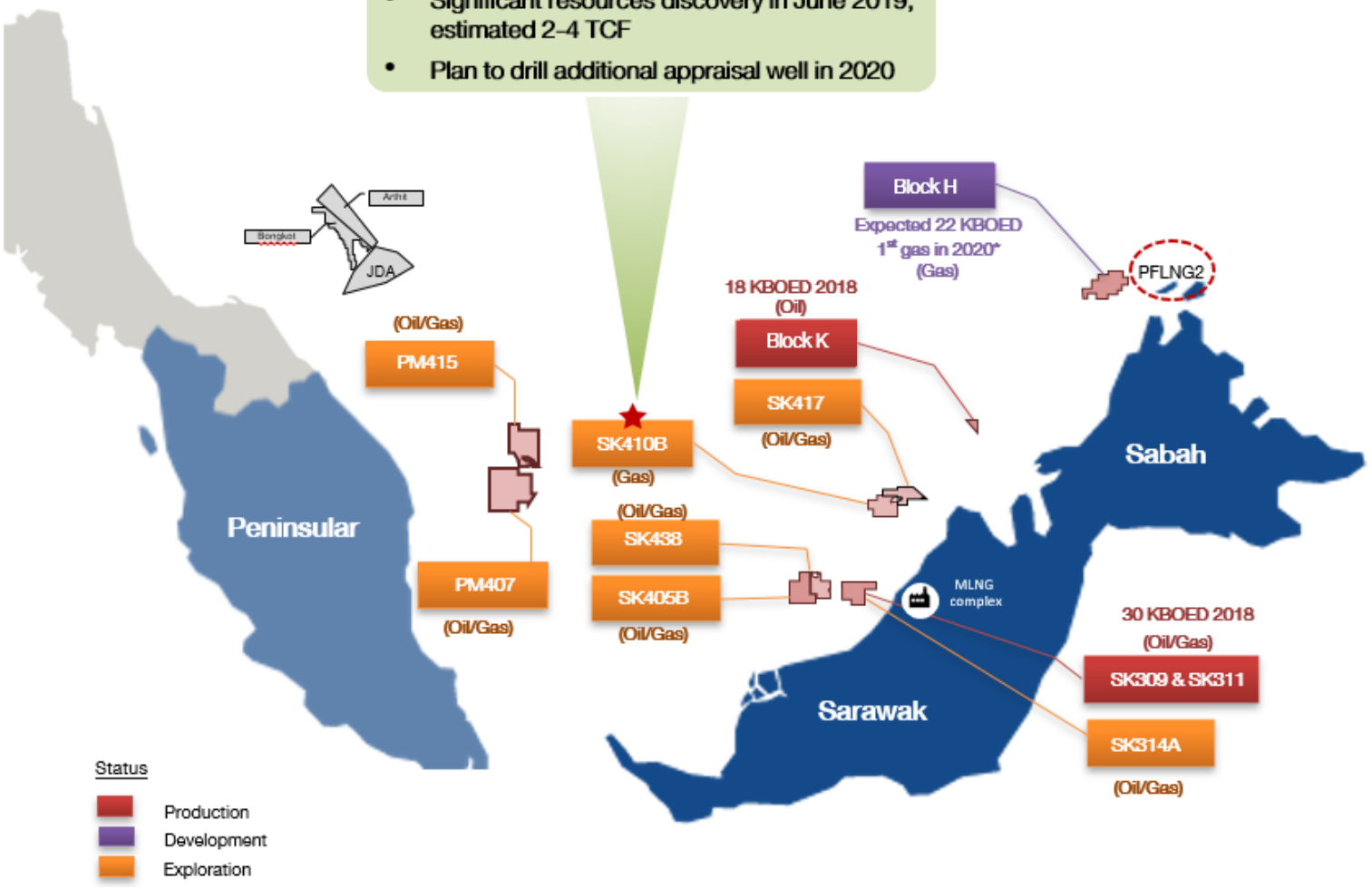
- Innovative solutions / technologies
- Economy of Scales

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

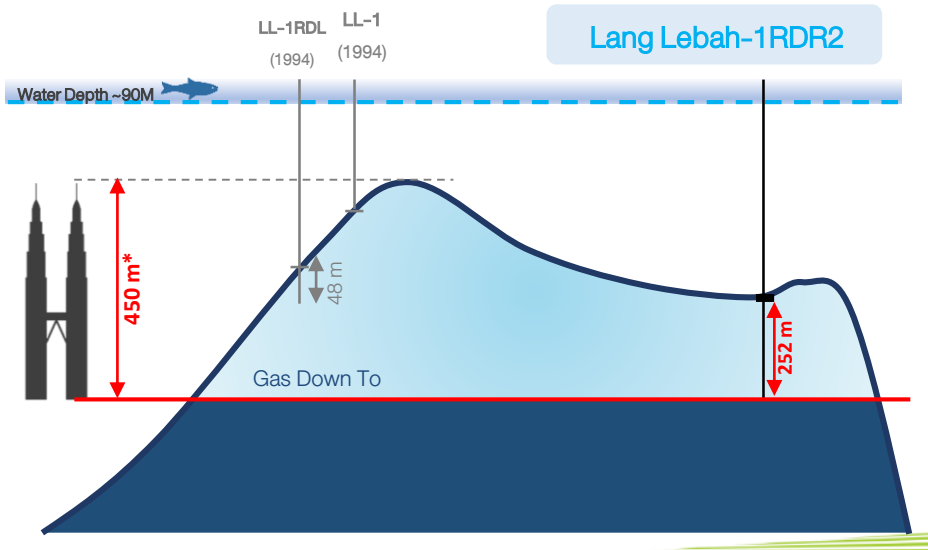


* Volume stated represents net sale volume

- With completion of Murphy's acquisition, PTTEP has become the 3rd 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

Successful Well Test Result:

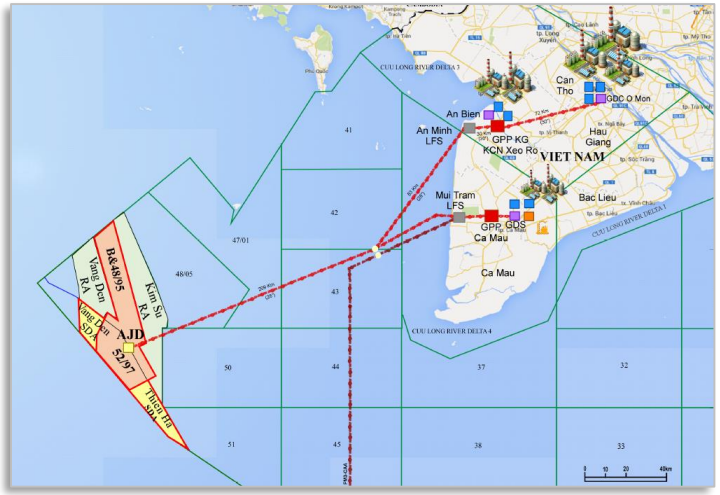
41.3 MMSCFD and 246 barrel of condensate per day through 40/64 – inches choke size



Other South East Asia countries

Expanding foothold in the region

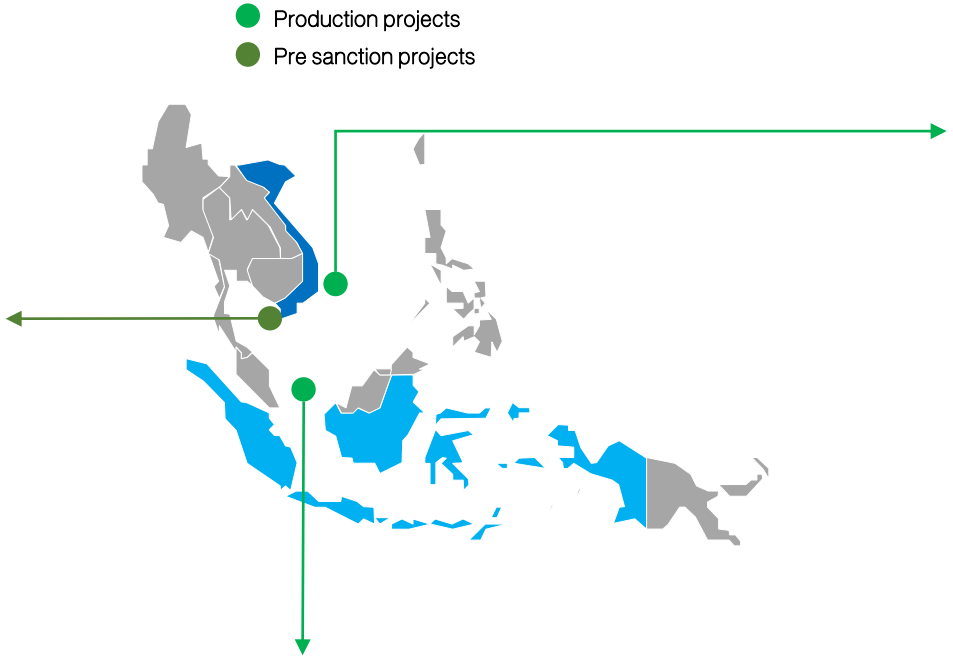
Vietnam and Indonesia



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)*

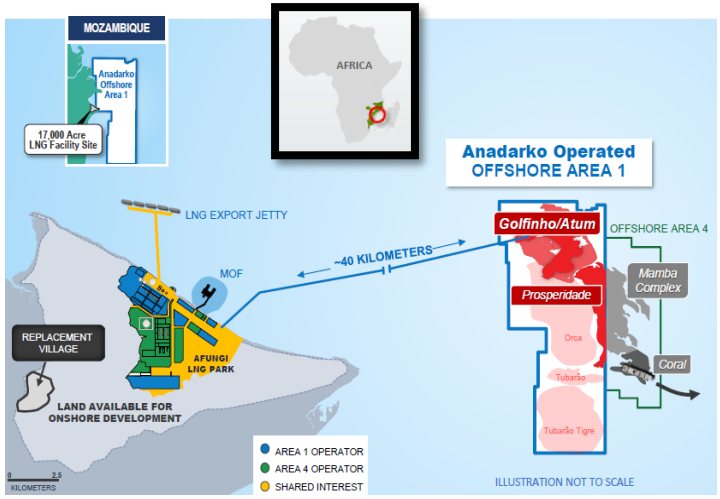
- Average sales volume of crude oil was 16 KBPD in 12M2019
- The project is currently drilling an additional production well to maintain production plateau.

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 mmcfd 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

1st Cargo *expected 2024*

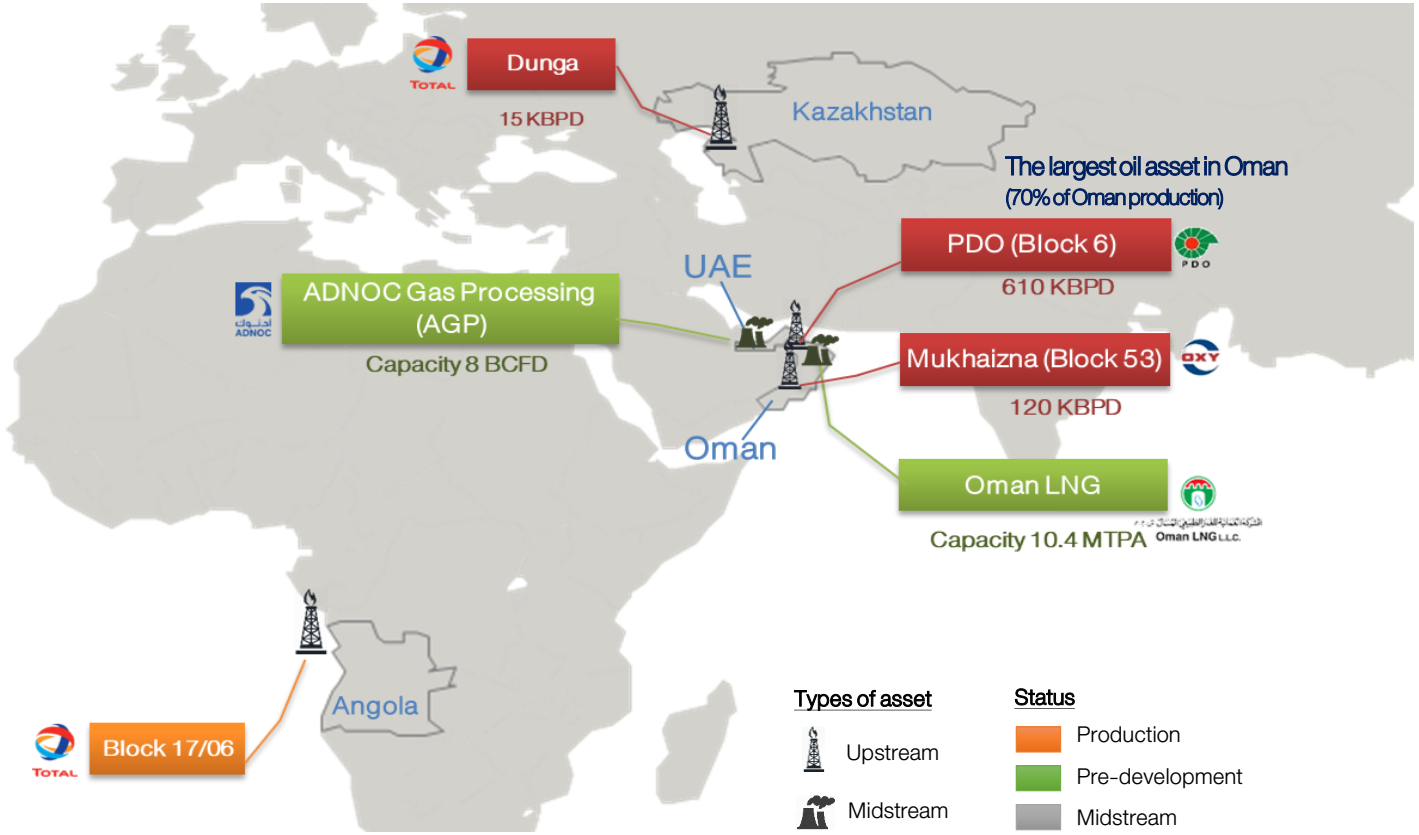
Acquisition of Partex

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

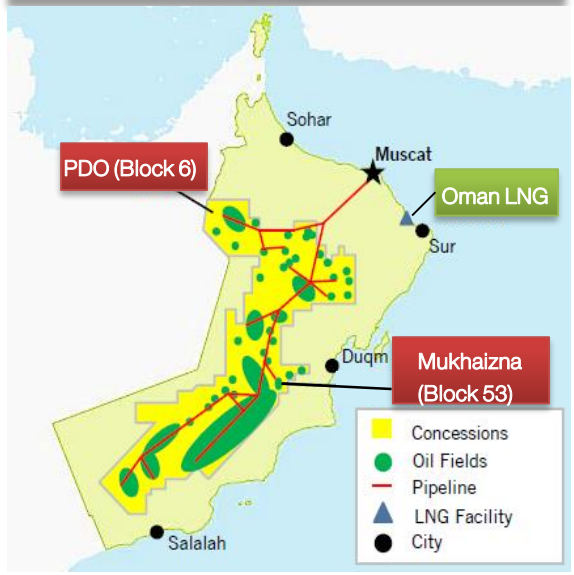


Note: Volumes stated represent gross volumes (100%)

The Middle East : World Class Assets under Partex

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

Oman



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

Joint Operating Company

Mukhaizna (Block 53)

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

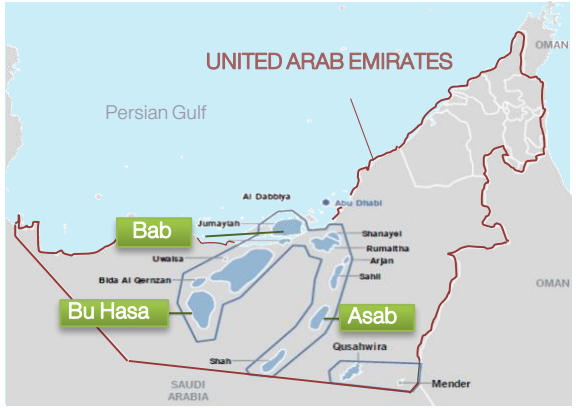
Operator

Oman LNG

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

Joint Operating Company

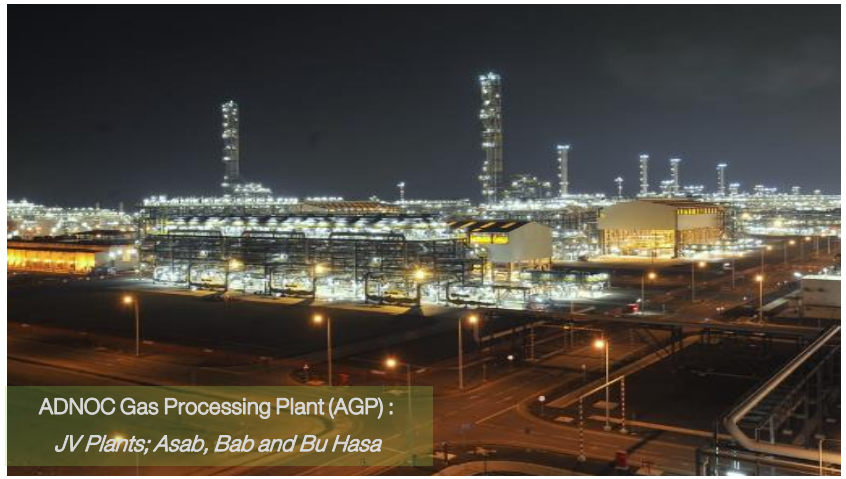
UAE



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

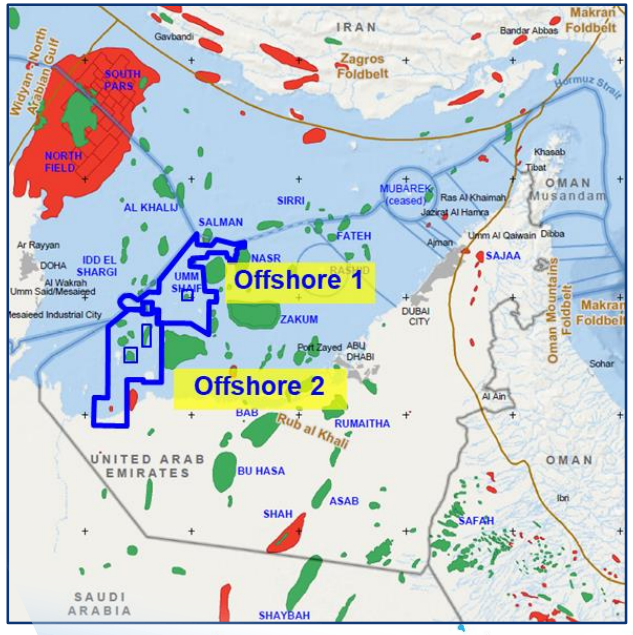
Operator



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	• Joined hand with prudent operators • UAE still has high potential prospective resources with significant sizeable discoveries	

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

America: Mexico, Brazil and Canada

-- 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

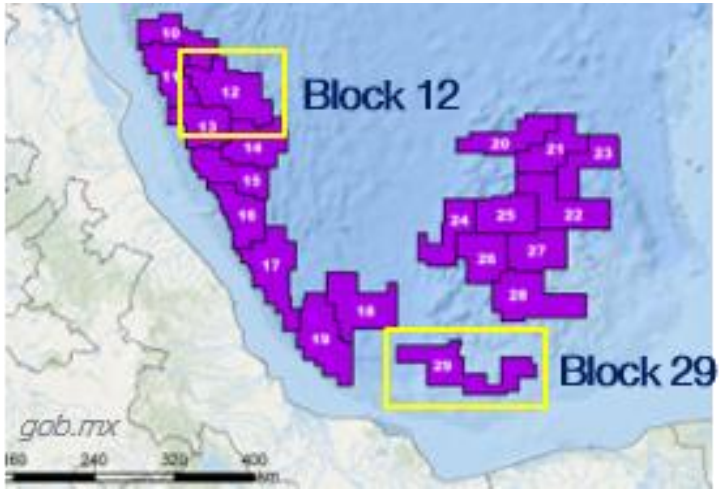
- Farm-in 25% from BG Group in 2014
- Operated by Shell Brasil (65% interest)
- Four offshore exploration blocks: BAR-M-215, BAR-M-217, BAR-M-252 and BAR-M-254

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

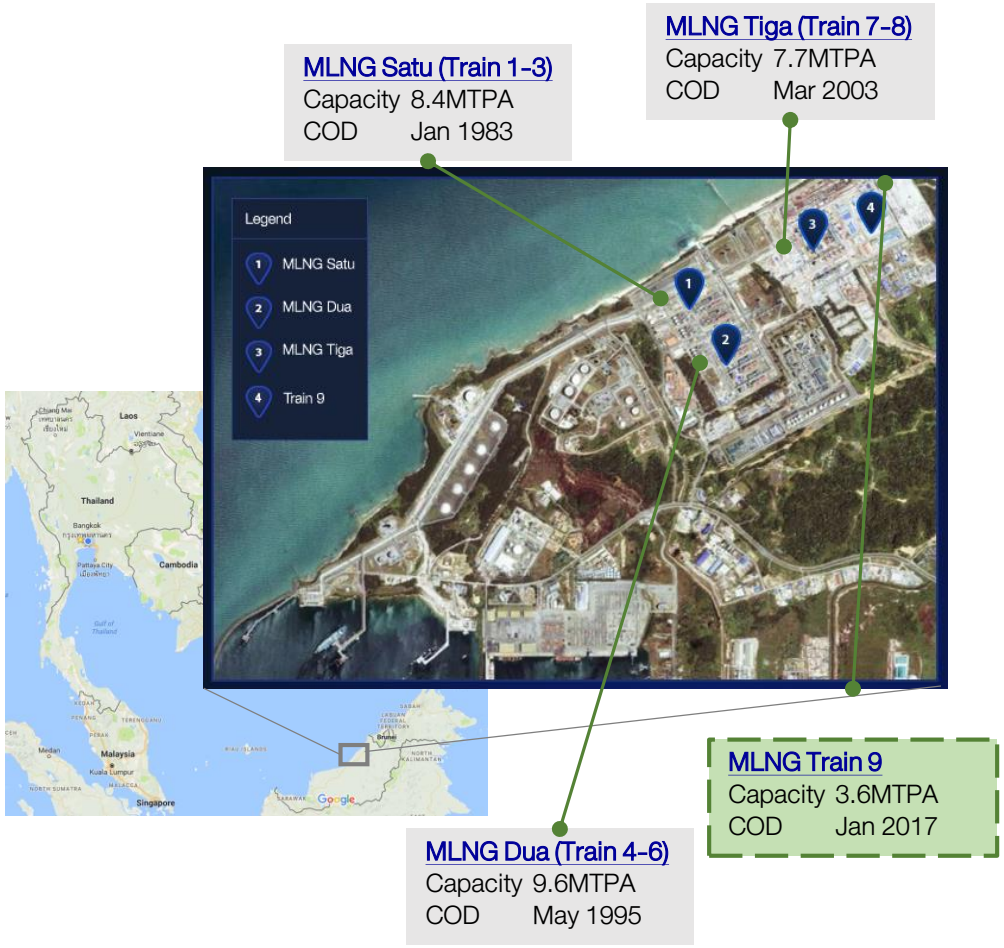
In 2019, projects received the exploration plan approval from the National Hydrocarbons Commission in Mexico and are currently evaluating the petroleum potential for further process according to the approved plan. Mexico block 29 (2.4) Project is in process of preparation for 2 exploration wells to be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

Gas to Power — *"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)

AI AND ROBOTICS VENTURES — *"Cutting Edge Technology for E&P and more"*

UAV

Aerial inspection service:

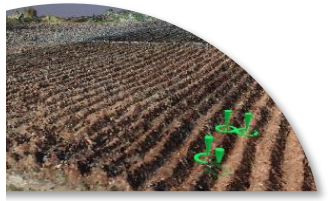
- Flare Tower
- Telecommunication Tower
- Tank inspection

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 information 1/5

	Project	Status*	Phase	PTTEP's Share	Partners (as Sep 2019)	12M2019 Average Sales Volume **		2020 Key Activities
						Gas (MMSCFD)	Liquid (KBPD)	
Thailand and JDA								
1	**Arthit**	OP	Production	80%	Chevron 16% MOECO 4%	226	11	• Ensure gas deliverability level at DCQ*** • Drill development wells
2	**B6/27**	OP	Production	100%		-	-	• Prepare for decommissioning activities
3	**B8/32 & 9A**	JV	Production	25%	Chevron 51.66% MOECO 16.71% KrisEnergy 4.63% Palang Sophon 2%	69	21	• Drill development wells • Perform waterflood activities
4	**Bongkot**	OP	Production	66.6667%	TOTAL 33.3333%	810	23	• Maintained production level as planned • Prepare for decommissioning activities
5	**Contract 3** *(Formerly Unocal III)*	JV	Production	5%	Chevron 71.25% MOECO 23.75%	629	41	• Drill development wells • Prepare for decommissioning activities
6	**Contract 4** *(Formerly Pailin)*	JV	Production	60%	Chevron 35% MOECO 5%	409	18	• Ensure gas deliverability level at DCQ*** • Drill development wells
7	**E5**	JV	Production	20%	ExxonMobil 80%	8	-	• Ensure gas deliverability level at DCQ***
8	**G4/43**	JV	Production	21.375%	Chevron 51% MOECO 21.25% Palang Sophon 6.375%	2	3	• Drill development wells
9	**G4/48**	JV	Production	5%	Chevron 71.25% MOECO 23.75%	3	0.7	• Drill development wells
10	**L53/43 & L54/43**	OP	Production	100%		-	1.7	• Maintain production plateau • Drill development wells
11	**PTTEP1**	OP	Production	100%		-	0.228	• Drill a development well • Maintain production plateau
12	**S1**	OP	Production	100%		10	Crude: 31 KBPD LPG: 0.2 KMT/D	• Drill development wells • Enhance oil recovery program includes hydraulic fracturing and artificial lift
13	**Sinphuhorm**	OP	Production	55%	Apico**** 35% ExxonMobil 10%	84	0.273	• Ensure gas deliverability • Drill an exploration well and development wells

* 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 information 2/5

	Project	Status*	Phase	PTTEP's Share	Partners (as of Sep 2019)	12M2019 Average Sales Volume **		2020 Key Activities
						Gas (MMSCFD)	Liquid (KBPD)	
Thailand and JDA								
14	**L22/43**	OP	Production	100%		-	-	• Maintain production operation
15	**MTJDA**	JOC	Production	50%	Petronas-Carigali 50%	334	9.4	• Drill development wells • Ensure gas deliverability level at DCQ***
16	**G9/43**	OP	Exploration	100%				
17	**G1/61 (Erawan)**	OP	Exploration	60%	MP G2 (Thailand) Limited 40%			• Awarded as an operator for Erawan field (Contract 1, 2 and 3) under PSC (after concession-end in 2022) • E&A study (seismic interpretation) • Installation new head platform
18	**G2/61 (Bongkot)**	OP	Exploration	100%				• Awarded as a sole operator under PSC (after concession-end in 2022/2023) • Drill appraisal and exploration wells • Installation new head platform
Others SEA								
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	• Production projects(SK309 and SK311, Block K): Maintain production plateau • Block H: first gas expected in Q3/2020 • Sarawak SK410B: drill an appraisal well • Other exploration projects: drill exploration wells, G&G study and perform 3D seismic activities
2	**Yadana**	JV	Production	25.5%	TOTAL 31.24% Chevron 28.26% MOGE 15%	776	-	• Drill exploration and development wells • Ensure gas deliverability level at DCQ***
3	**Yetagun**	JV	Production	19.3178%	Petronas-Carigali 30.00140% MOGE 20.4541% Nippon Oil 19.3178% PC Myanmar (Hong Kong) 10.90878%	105	2.3	• Maintain production level • Drill exploration and development wells
4	**Zawtika (M9 & a part of M11)**	OP	Production	80%	Myanma Oil and Gas Enterprise (MOGE) 20%	297	-	• Ensure gas deliverability level at DCQ*** • Drill exploration and development wells • Perform 3D seismic activities
5	**Myanmar M3**	OP	Exploration	80%	MOECO 20%			• FEED/ Subsurface/ Surface studies • Negotiate and finalize GSA
6	**Myanmar M11**	OP	Exploration	100%				• Perform 3D seismic activities • Block relinquish
7	**Myanmar MD-7**	OP	Exploration	50%	TOTAL 50%			• Drill an exploration well • 3D Reprocessing seismic activities • G&G studies

* Status: OP = PTTEP operatorship / JOC = PTTEP joint operatorship/ JV = PTTEP Joint Venture Partner
** 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 information 3/5

	Project	Status*	Phase	PTTEP's Share	Partners (as of Sep 2019)	12M2019 Average Sales Volume		2020 Key Activities
						Gas (MMSCFD)	Liquid (KBPD)	
Others SEA								
8	**Myanmar MOGE 3**	OP	Exploration	77.5%	Palang Sophon 10% MOECO 10% WinPreciousResources 2.5%			• G&G studies • Complete site reinstatement
9	**Vietnam 9-2**	JOC	Production	25%	PetroVietnam 50% SOCO 25%	14	4.4	• Maintain production level • Perform well intervention program • Development drilling study support
10	**Vietnam 16-1**	JOC	Production	28.5%	PetroVietnam 41% SOCO 28.5% OPECO 2%	7	16	• Maintain production level • Drill development wells
11	**Vietnam B & 48/95**	JV	Exploration	8.5%	PVN 65.88% MOECO 25.62%			• FEED study • Negotiation process on commercial terms in order to push forward the Final Investment Decision (FID) • the first production target at the end of 2023
12	**Vietnam 52/97**	JV	Exploration	7%	PVN 73.4% MOECO 19.6%			• FEED study • Negotiation process on commercial terms in order to push forward the Final Investment Decision (FID) • the first production target at the end of 2023
13	**Natuna Sea A**	JV	Production	11.5%	Premier Oil 28.67% KUFPEC 33.33% Petronas 15% Pertamina 11.5%	195	1.3	• FEED study: Start Anoa & Gajah Baru compressor project
Middle East								
1	**Abu Dhabi Offshore 1**	JV	Exploration	30%	Eni Abu Dhabi 70%			• Reprocess Seismic • G&G studies
2	**Abu Dhabi Offshore 2**	JV	Exploration	30%	Eni Abu Dhabi 70%			• Drill an exploration well • Perform 3D seismic activities
3	**PDO (Block 6)**	JOC	Production	2%	Government of Oman 60% Shell 34% Total 4%		618**	• A part of Partex acquisition which was completed on 4 November 2019 • Maintain production plateau
4	**Mukhaizna**	JV	Production	1%	Occidental 47% OOCEP 20% Indian Oil 17% Mubadala 15%		109**	• A part of Partex acquisition which was completed on 4 November 2019 • Maintain production plateau
5	**Block 12**	JV	Exploration	20%	Total 20%			• 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

* Status: OP = PTTEP operatorship / JOC = PTTEP joint operatorship / / JV = PTTEP Joint Venture Partner
** The average sales volumes per day are calculated from the completion date of acquisition transaction

Project information 4/5

	Project	Status*	Phase	PTTEP's Share	Partners (as of Sep 2019)	12M2019 Average Sales Volume **		2020 Key Activities
						Gas (MMSCFD)	Liquid (KBPD)	
Other International								
1	**PTTEP Australasia (PTTEP AA)**	OP	Exploration	90%-100% (varied by permits)				• AC/RL7 (Cash Maple): under the evaluation of appropriated development plan and seeking partner to manage the project's risk • Other exploration projects: G&G and P&A studies • AC/L3: total block relinquishment
2	**Mozambique Area 1**	JV	Development	8.5%	Total, Mitsui, ENH, ONGC 26.5%,20% Beas Rovuma, Bharat 15%, 10% 10%, 10%			• First Cargo is expected by 2024 • Finalize project Finance • Continue Onshore and Offshore well construction • Complete Resettlement
3	**Algeria 433a & 416b (Bir Seba)**	JOC	Production	35%	PetroVietnam 40% Sonatrach 25%	-	18 *(net entitlement)*	• Drill production wells
4	**Algeria Hassi Bir Rekaiz**	OP	Development	24.5%	CNOOC 24.5% Sonatrach 51%			• Drilling development wells • FEED study • Continue Improvement oil study (IOR)
5	**Mariana Oil Sands**	OP	Exploration	100%				• Assess appropriated development approach
6	**Barreirinhas AP1**	JV	Exploration	25%	Shell Brasil 65% Mitsui E&P Brasil 10%			• G&G studies
7	**Brazil BM-ES-23**	JV	Exploration	20%	Petrobras 65% INPEX 15%			• G&G studies
8	**Mexico block 12 (2.4)**	JV	Exploration	20%	PC Carigali Mexico 60% Ophir Mexico 20%			• EIA and G&G study to access petroleum potential
9	**Mexico block 29 (2.4)**	JV	Exploration	16.67%	Repsol Mexico 30% PC Carigali Mexico 28.33% Sierra Nevada 25%			• Drilling Exploration wells • G&G study to access petroleum potential

* Status: OP = PTTEP operatorship / JOC = PTTEP joint operatorship/ JV = PTTEP Joint Venture Partner
** Sales volume stated at 100% basis except for Algeria 433a & 416b (Net Entitlement)

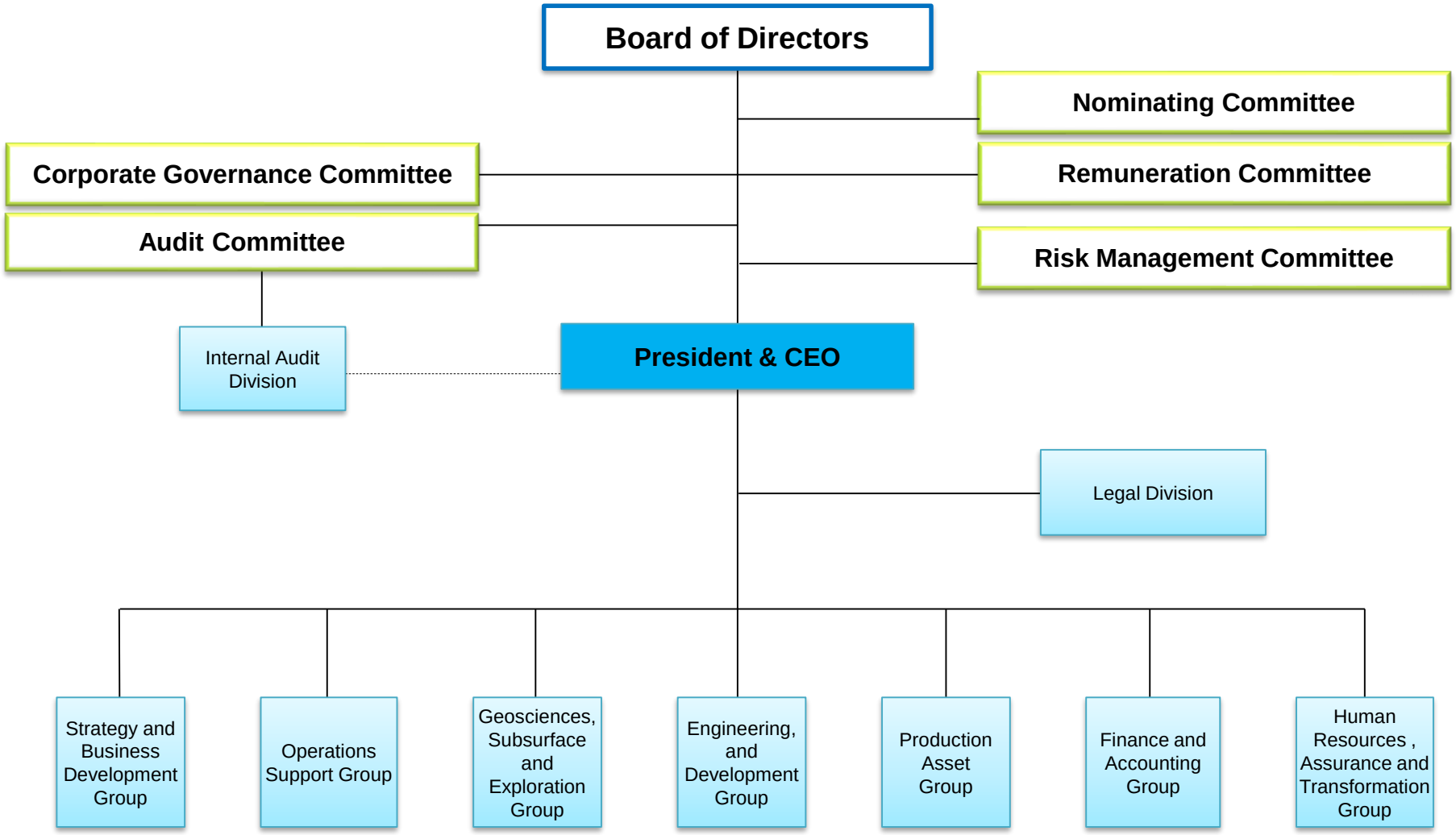
Project information 5/5

	Project	Status*	Phase	PTTEP's Share	Partners (as of Sep 2019)	12M2019 Average Sales Volume **		2020 Key Activities
						Gas (MMSCFD)	Liquid (KBPD)	
Other International								
10	**Block 17/06**	JV	Pre development	2.5%	Total 30% Sonangol 30% SSI 27.5% Acrep 5% Falcon Oil 5%			• A part of Partex acquisition which was completed on 4 November 2019 • Maintain production plateau
11	**Potiguar**	OP	Production	50%	Petrobras 50%		0.2	• A part of Partex acquisition which was completed on 4 November 2019 • Maintain production plateau
12	**Dunga**	JV	Production	20%	Total* 60% OOCEP 20%	2	11	• A part of Partex acquisition which was completed on 4 November 2019 • Maintain production plateau
Midstream Project								
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%			• A part of Partex acquisition which was completed on 4 November 2019
2	**ADNOC Gas Processing (AGP)**	JV	On line	2%	ADNOC 68% Shell 15% Total 15%			• A part of Partex acquisition which was completed on 4 November 2019

- Status: OP = PTTEP operatorship / JOC = PTTEP joint operatorship/ / JV = PTTEP Joint Venture Partner
** The average sales volumes per day are calculated from the completion date of acquisition transaction

Organization structure

Ensuring transparency, integrity and good corporate governance



Supplementary Index : Ratio & Formula

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