



**PTTEP**

MEMBER OF

**Dow Jones  
Sustainability Indices**

In Collaboration with RobecoSAM

# Investor Presentation

February 2021

## **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.



# PTTEP Introduction



# PTTEP – E&P arm of the PTT Group

Performing a pivotal role in Thailand's Oil & Gas exploration and production



Government of Thailand

63.3%<sup>1</sup>



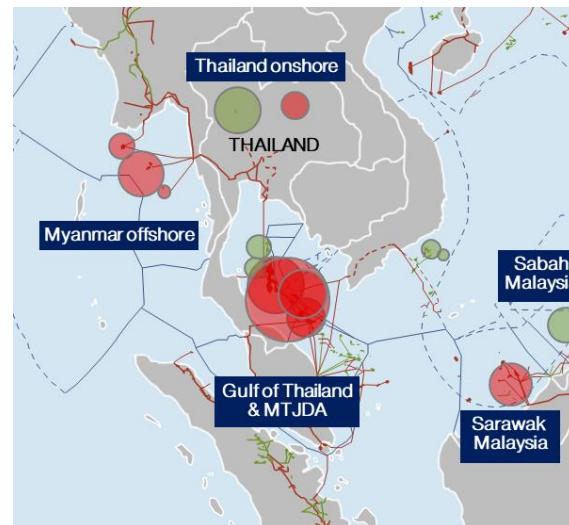
Thailand's National energy company

65.3%<sup>2</sup>



- ▶ **Largest** oil & gas producer in Thailand and Myanmar
- ▶ **Synergy** with PTT's gas value chain through its dominant position in the regional gas market
- ▶ **Opportunities** to expand into regional investments

## Key operations in SEA



○ Approx. 20 KBOED of net sales volume    ● Gas-weighted    ● Oil-weighted

95%

of PTTEP's total sales volume

78%

of PTTEP's sales volume sold to PTT

13.6 USD/BOE

Average regional cash cost

## International



**BBB+ / Stable**

BBB stand-alone rating



**BBB+ / Stable**

BBB stand-alone rating



**Baa1 / Stable**

Baa2 stand-alone rating

## National



**AAA / Stable**

Notes:

1. 51.1% is directly held by the Government of Thailand (Ministry of Finance), with the remaining 12.2% held by the state-controlled Vayupak Fund I as of 5 Jan 2021

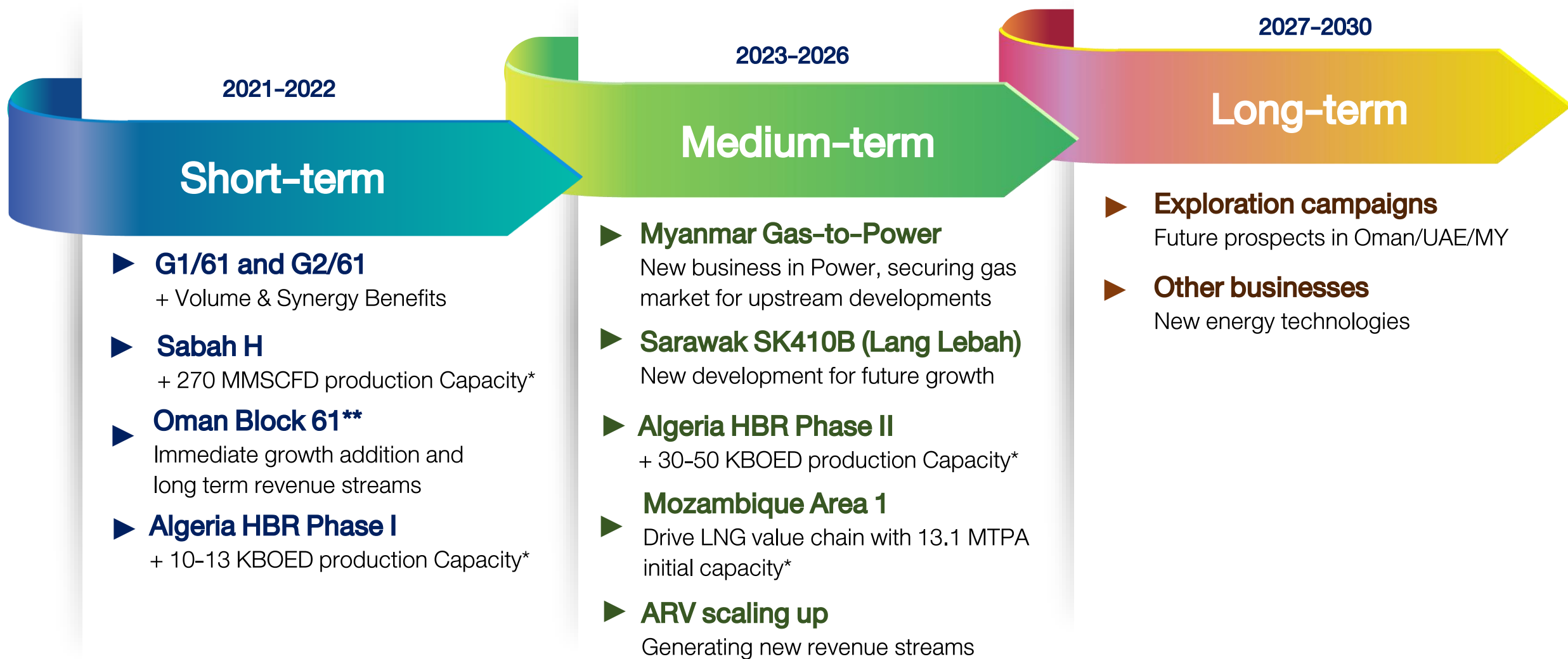
2. Ownership as of 14 August 2020 (PTT and Siam Management Holding Co., Ltd. (Subsidiary of PTT))



# Strategy and Projects progress



# PTTEP Growth drivers in 2021 and Beyond



Note: \* The amounts of production capacity only represent a 100% share, not PTTEP's participating interest in the project.

\*\* New M&A announced on Feb 1, 2021 with expected Completion Date in 2021

## Key Assets Transition

### G1/61 (Erawan)

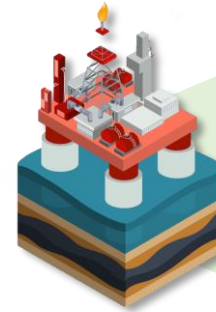
- Prioritize site access and commence equipment & facilities installation
- Signing GSA with buyers
- Human resources integration and G1 working model

### G2/61 (Bongkot)

- On track – deliver gas at the minimum volume stated in PSC 2022@200MMSCFD 2023@700MMSCFD
- New production platforms installation in 2021 and 2022



## Existing Asset value maximization



Accelerate progress in Lang Lebah, Algeria HBR and Mozambique Area 1

Value creation for assets in GoT, Malaysia, Myanmar and Middle East

New Exploration & Appraisal drilling activities for long-term growth

### SK410B (Lang Lebah) Appraisal well result

- Very positive result with amount of gas discovery beyond previous estimation
- Completed Pre-Feed study with Front End Engineering Design in 2021
- FID planned in 2022





# New Acquisition to strengthen portfolio – Oman Block 61

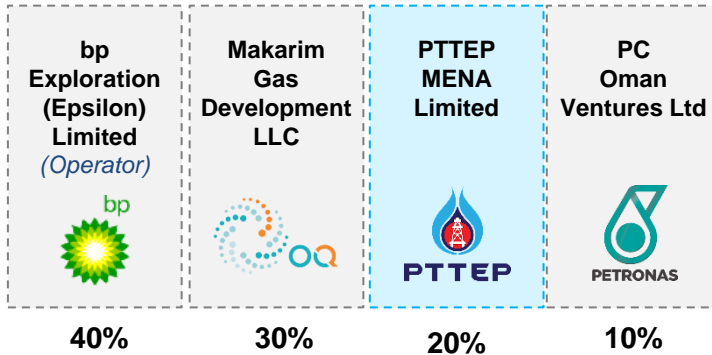
Deal size

**2,450\***  
Million USD

Deal Completion

**Within 2021**  
subject to regulatory  
approvals

## Post transaction structure



## Block 61

### Off-taker

Oman government

### Reservoirs

Tight clastic

### Development Concept

Grid drilling and  
hydraulic fracturing

### Phase 1 : Khazzan

FID 2013, 1<sup>st</sup> Gas 2017

### Phase 2 : Ghazeer

FID 2018, 1<sup>st</sup> Gas Oct 2020

### Combined Production

**Capacity:** Gas 1500MMSCFD  
and Condensate >65KBOED

## Asset highlights



**Critical gas asset for the energy security of Oman**  
~ 35% of current gas supply\*\*



**Cash flow stream from gas sales at fixed gas prices**



**Secured Long-term GSA totaling 1.5 BCFD with Take-or-Pay obligation**



**Immediate addition to Sales volume, Reserves & reduce unit cost of PTTEP port.**



**Developing 10.5 TCF of gas resources**



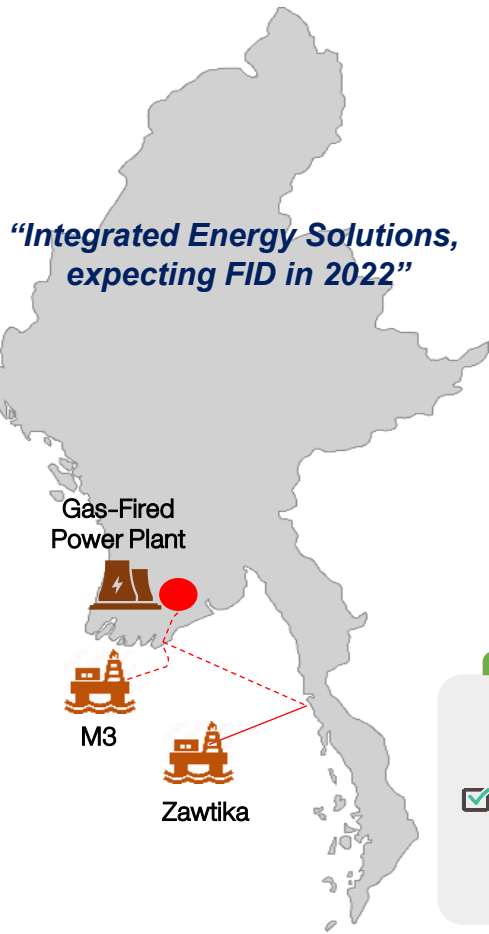
Note: \*excluding 140 Million USD contingent payment upon completion of conditions per SPA

\*\* Source from Wood Mackenzie



# New Business – Supporting Medium to Long-term growth

## Myanmar – Gas to Power



~2 billion USD investment covering upstream developments, pipelines network and 600MW Power Plant plus transmission line

Supply ~10% of Myanmar's existing installed power plant capacity

Electric Power Generation Enterprise ("EPGE") as buyer, with 20-year term and 5- year extension from COD

Important milestone in Power business

### Completed

- ✓ Notice to Proceed Approved in 2020

### Next Steps

- ✓ GSA / PPA signing
- ✓ Engineering preparation
- ✓ Funding arrangements

## AI & Robotics



Subsea

ROV 1st award tender from Mubadala; Nautilus preparing for commercialization; Thai Oil AUV service completed



AgriTech

Sales and service of sprayer drones, farm management APP, and forest management



DroneBiz

Pursuing business partnerships and approaching customers



HealthTech

Xterilizer UV-C robot re-launched & scaling; Holistic business blueprint in progress

## Renewables

- JV with experienced partner
- Exploring in SEA and other potential areas for operating and constructing phases of Wind/Solar projects



# Sustainability and ESG

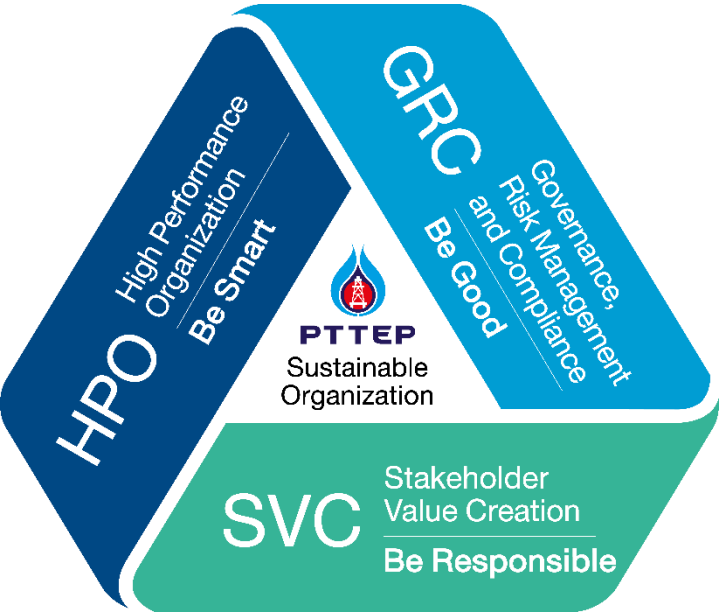




# Delivering Sustainability & Positive Societal Impacts

## “Energy Partner of Choice”

through Competitive Performance and Innovation for Long-term Value Creation



PTTEP JOURNEY TOWARDS SUSTAINABILITY

### 2030 Targets

#### GHG Reduction



**25%**

Reduction of  
GHG emissions intensity  
(2012 base year)

#### Circular Model for E&P



**≥50%**

of main structures reused

**Zero** waste to landfill



#### Ocean for Life



**Net Positive Impact**  
of Biodiversity & Ecosystem Services  
in Offshore Operations  
(2019 base year)

**≥50%**

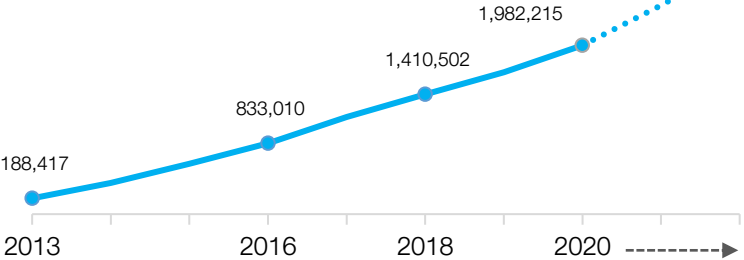
Increase in Community Income for  
local community that participated  
in our program  
(before project implementation)

### 2020 Key Performance

#### Accumulative GHG Emissions Reduction

(Unit: Absolute (tonne CO<sub>2</sub> equivalent))

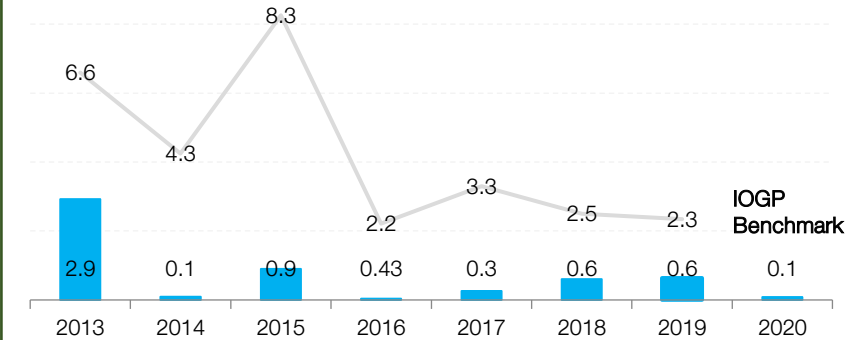
8% Reduction of GHG Emission Intensity in 2020  
(compared to 2012 base year)



#### Oil and Chemical Spill Rate

(Unit: Tonne per million tonne of petroleum production)

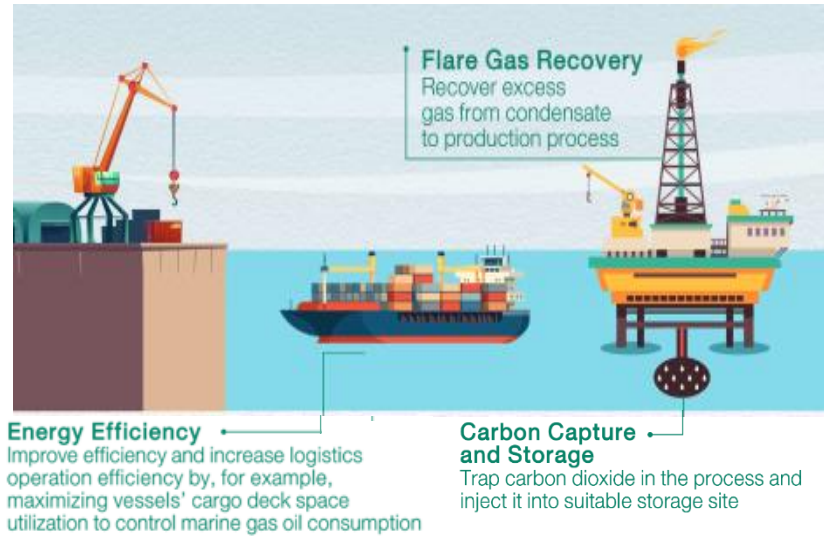
Towards Zero Spills Aspiration





# Key Highlights

## GHG Reduction



## Renewable Energy

> 70% of energy used at offshore remote platforms are from renewable energy (Thailand)



## Circular Model for E&P

### Zero Waste to Landfill

Achieved zero hazardous waste to landfill in 2020

### Topside Reuse Project

1<sup>st</sup> Topside Reuse was introduced at Arthit Operation in 2021



### Pilot Recycled Drill Cuttings Road

1<sup>st</sup> Pilot completed at PTTEP Technology and Innovation Centre (PTIC)



## Ocean for Life

### MoU with Kasetsart University



- Baseline Study of Microplastics in the GoT
- 1<sup>st</sup> Sampling conducted in Q4/2020

### MoU with Department of Marine and Coastal Resources



10-year cooperation (2020-2030) to support Ocean for Life target in 2030

### CSR Projects

- Aquatic Animal Hatchery Learning Center, Sea Turtle Conservation
- "H.T.M.S. Prab and Sattakut" underwater learning sites
- Mangrove Plantation
- Coastal Conservation Area and Fish Home
- Ocean Waste Management
- Sea Food Product Value Enhancement





# Financial Performance



**2020 Net Income 720 MMUSD ▼ 54% YTD**

## Sale Volumes



▲ **1% YTD**

Increase from Partex & Malaysia  
offset with a decline in Gulf of Thailand

## Average Selling Price



	2019	2020
Gas (\$/MMBTU)	6.92	6.27
Liquid (\$/BBL)	61.18	41.55
Weighted Avg. (\$/BOE)	47.24	38.92
Avg. Dubai (\$/BBL)	63.51	42.27
Volume Mix (Gas : Liquid)	71:29	67:33

▼ **18% YTD**

Lower global crude oil price

## Unit Cost



Unit : \$/BOE	2019	2020
Cash cost	15.88	14.40
Non-Cash cost	15.83	16.10
Unit cost	31.71	30.50

Note: Unit Cost : Exclude costs related to new business

▼ **4% YTD**

Maintain unit cost at  
competitive level

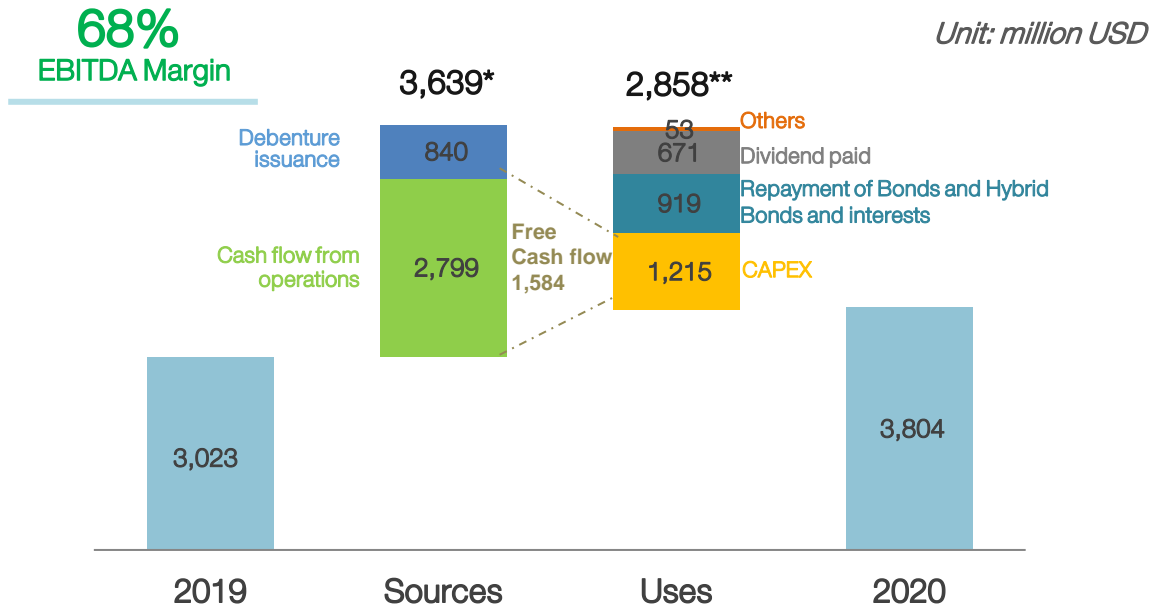


# Results – Cash flows and Financial Position

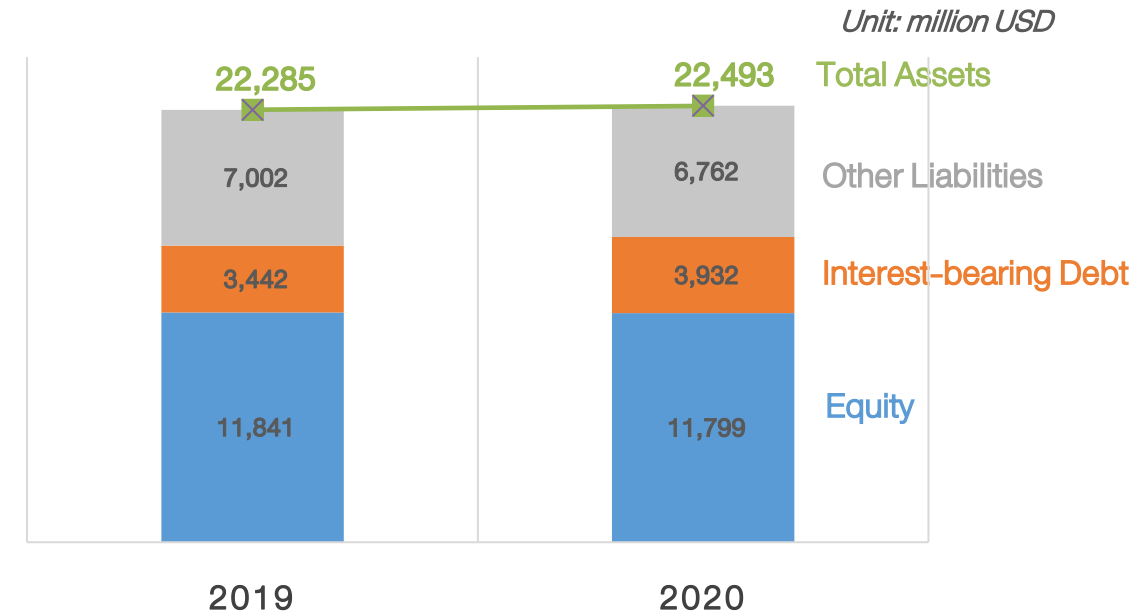
Stormproof financial health to withstand economic uncertainties



## 2020 CF : Source and Use of Funds



## Financial Position



## Debt Profile

D/E ratio	0.29x	0.33x	Weighted Average Loan Life (Years)	13.84	14.08
Weighted Average Cost of Debt (%)	4.41	3.44	Fixed : Floating	82:18	82:18

Note: Debt profile excludes Hybrid bonds

## 2021 Guidance *with Oman Block 61* <sup>(1)</sup>

Average Sales Volume <sup>(2)</sup> Average Gas Price <sup>(3)</sup>

KBOED



USD/MMBTU



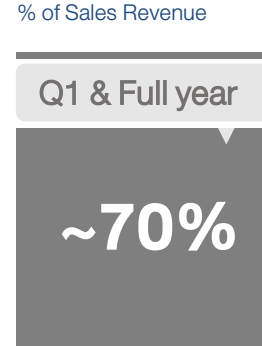
Unit Cost

USD/BOE



EBITDA Margin

% of Sales Revenue



Note:

<sup>(1)</sup> New M&A announced on Feb 1, 2021 with expected Completion Date in 2021

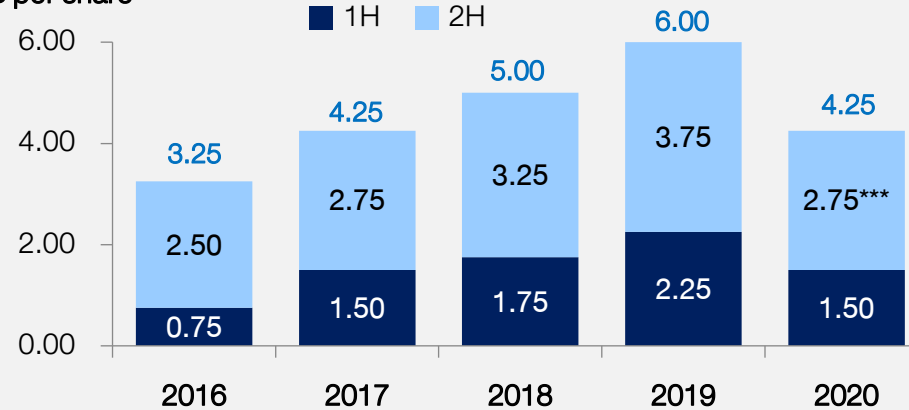
<sup>(2)</sup> Include sales volume from ADNOC Gas Processing (AGP)

<sup>(3)</sup> Based on average Dubai oil price in 2021 at 50 \$/BBL

<sup>(4)</sup> Subject to approval from 2021 Annual General Shareholders' Meeting

## Dividend Payment History

THB per share



Payout Ratio (% of net income)	98	90	55	49	77
Payout Ratio (% of recurring net income)	79	64	51	53	71

Schedule for 2H2020 Dividend Payment <sup>(4)</sup>

*XD Date* 1 March 2021

*Record date* 2 March 2021

*Payment Date* 26 April 2021

## Credit Rating/Outlook

International



**BBB+ / Stable**

BBB stand-alone rating



**BBB+ / Stable**

BBB stand-alone rating



**Baa1 / Stable**

Baa2 stand-alone rating

National



**AAA / Stable**



# 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)



<http://www.pttep.com>





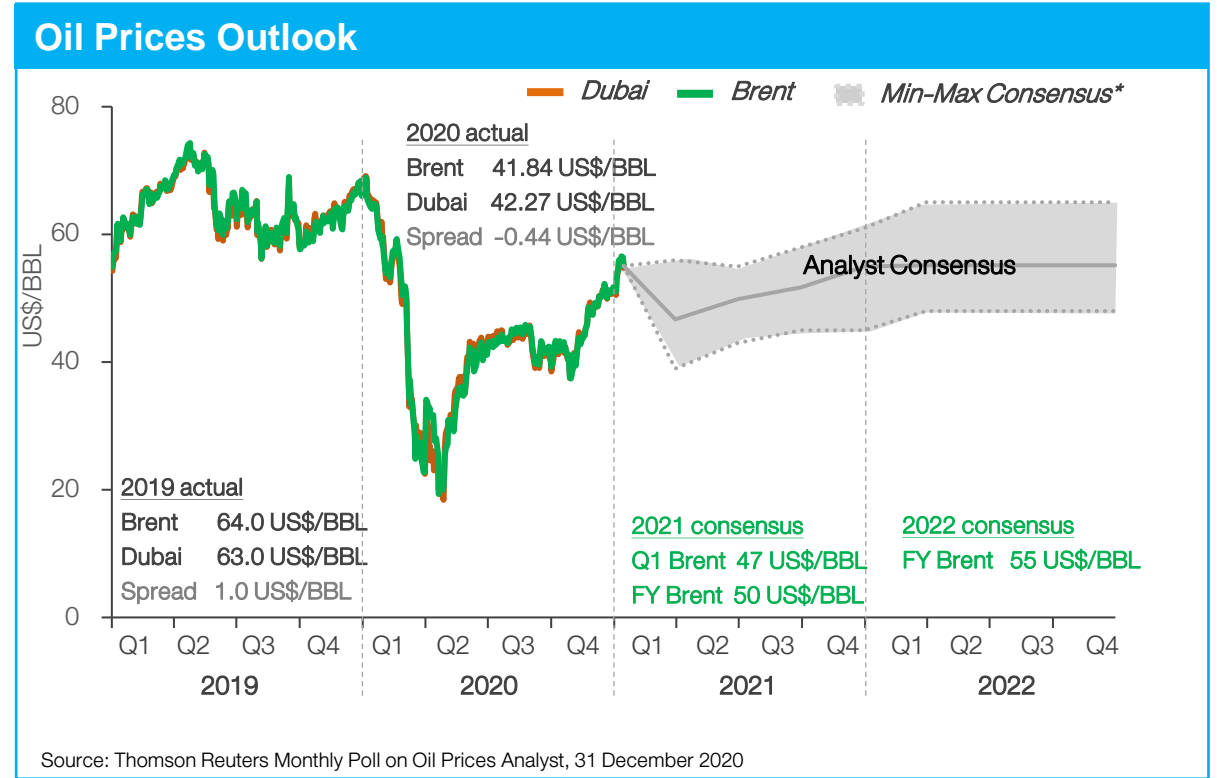
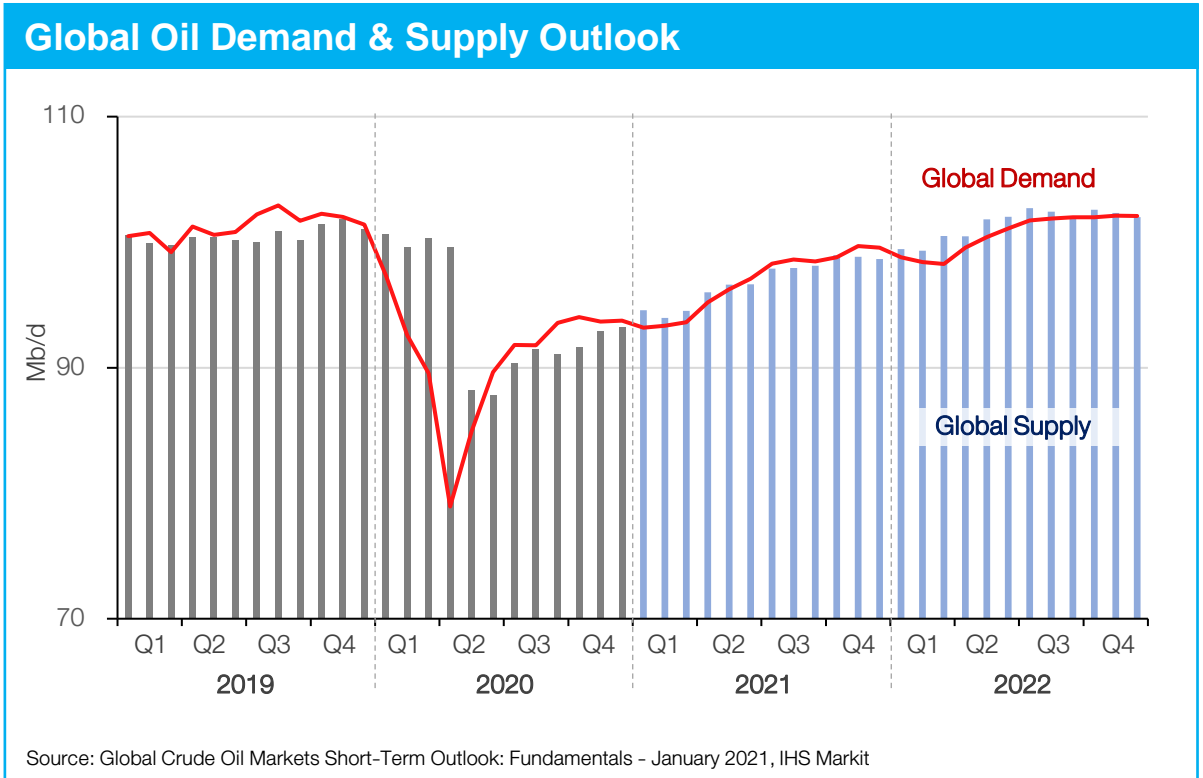
## Supplementary information

●	Energy Demand and Prices	19-20
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# Oil Market update

Short-term upside from Demand recovery. Long-term pressure from Energy Transition.




Key factors to monitor




Vaccine Covid-19


COVID-19 Situation & Vaccine Distribution




Economic Recession & Stimulus Measures




Green Energy Policies under Biden



OPEC+ Production cuts agreement



US shale Shut-in/Bankruptcies

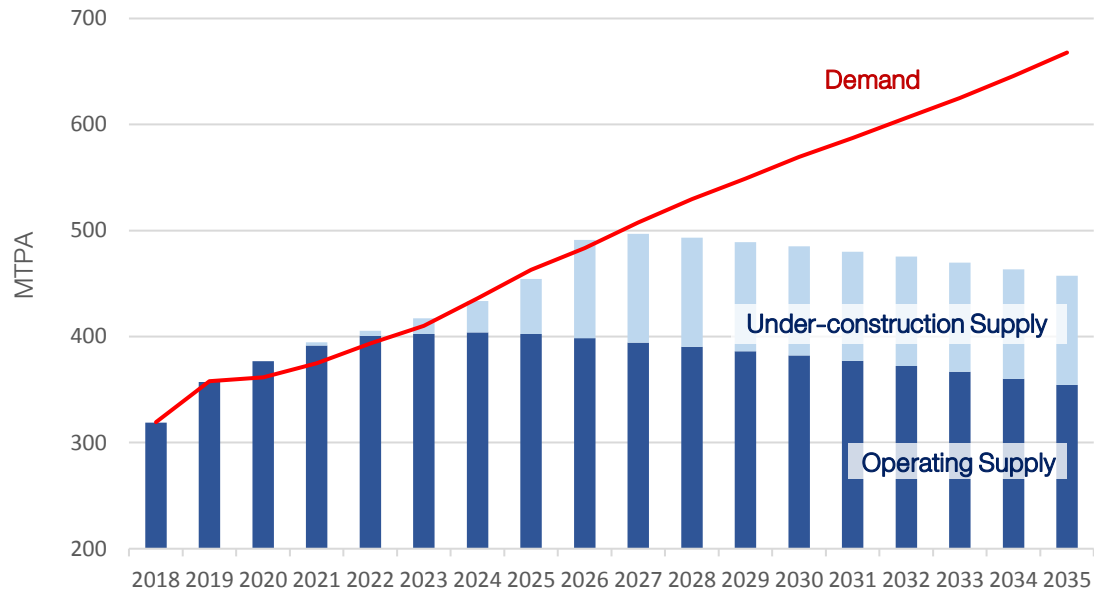


US Sanction Policy on Iran & Venezuela

# Gas Market update

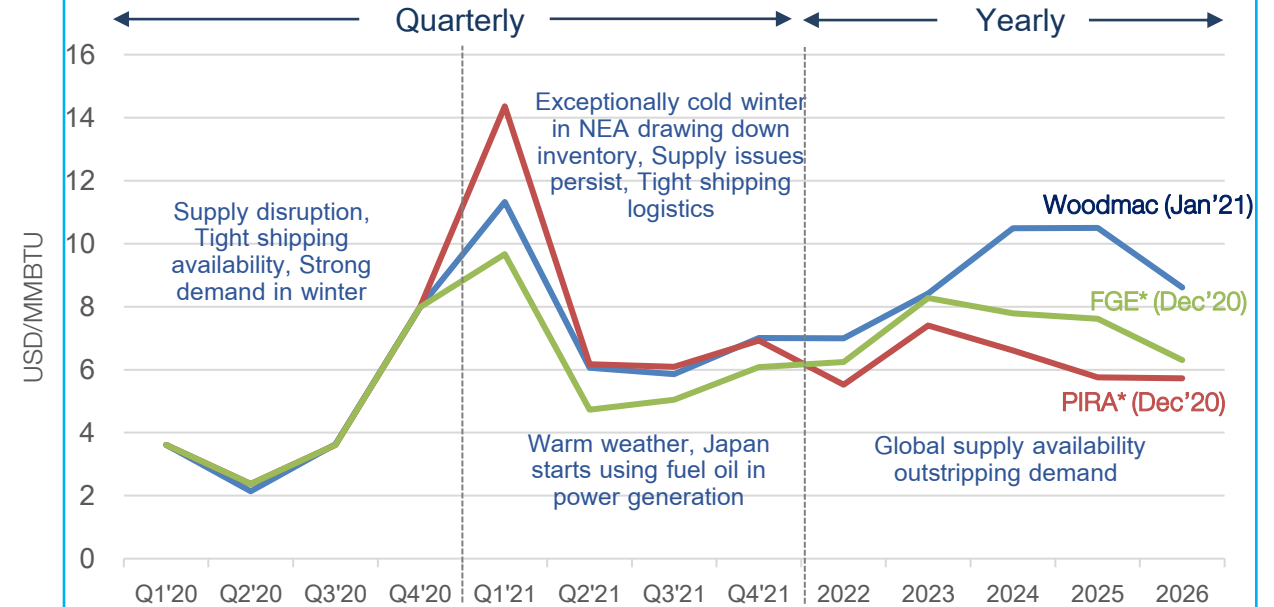
Short-term recovery to pre-COVID level. Long-term growth as transitional energy source.

## Global LNG Demand & Supply Outlook



Source: FGE, 7 January 2020

## LNG Spot Prices Outlook



Source: Information as of January 2021. FGE/PIRA published latest price forecast for 2021 only.

### Key factors to monitor



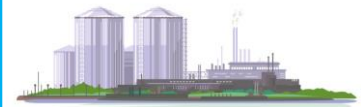
COVID-19 Situation & Vaccine Distribution



LNG Liberalization & Domestic Gas Production in Asia



Green Energy Policies under Biden



Supply from new projects



# Results – Net Income

Softened from lower selling price & energy demand despite volume increase from Murphy and Partex

Unit: MMUSD

Statements of Income	2020	2019	%YTD	Q4 20	Q3 20	% QoQ	Q4 19	% YoY
<b>Total Revenues</b>	<b>5,357</b>	<b>6,413</b>	<b>(16%)</b>	<b>1,348</b>	<b>1,305</b>	<b>3%</b>	<b>1,841</b>	<b>(27%)</b>
Sales	5,043	6,046	(17%)	1,292	1,228	5%	1,755	(26%)
Sales Volume (BOED)	354,052	350,651	1%	381,285	344,317	11%	395,028	(3%)
Sales Price (US\$/BOE)	38.92	47.24	(18%)	36.85	38.77	(5%)	48.28	(24%)
Gain on Financial Instruments	99	-	100%	-	27	(100%)	-	-
<b>Total Expenses</b>	<b>4,637</b>	<b>4,844</b>	<b>(4%)</b>	<b>1,267</b>	<b>1,075</b>	<b>18%</b>	<b>1,457</b>	<b>(13%)</b>
<b>Major Expenses:</b>								
Operating Expenses	795	751	6%	234	181	29%	281	(17%)
Exploration Expenses	104	128	(19%)	27	8	238%	28	(4%)
G&A	314	384	(18%)	117	69	70%	133	(12%)
DD&A	2,086	2,026	3%	548	515	6%	578	(5%)
Loss on Financial Instruments	-	109	(100%)	72	-	100%	41	76%
Income Tax Expenses	603	677	(11%)	79	140	(44%)	189	(58%)
<b>Net income</b>	<b>720</b>	<b>1,569</b>	<b>(54%)</b>	<b>81</b>	<b>230</b>	<b>(65%)</b>	<b>384</b>	<b>(79%)</b>
Recurring Net Income	781	1,445	(46%)	168	195	(14%)	379	(56%)
Non-recurring Net Income	(61)	124	(>100%)	(87)	35	(>100%)	5	(>100%)

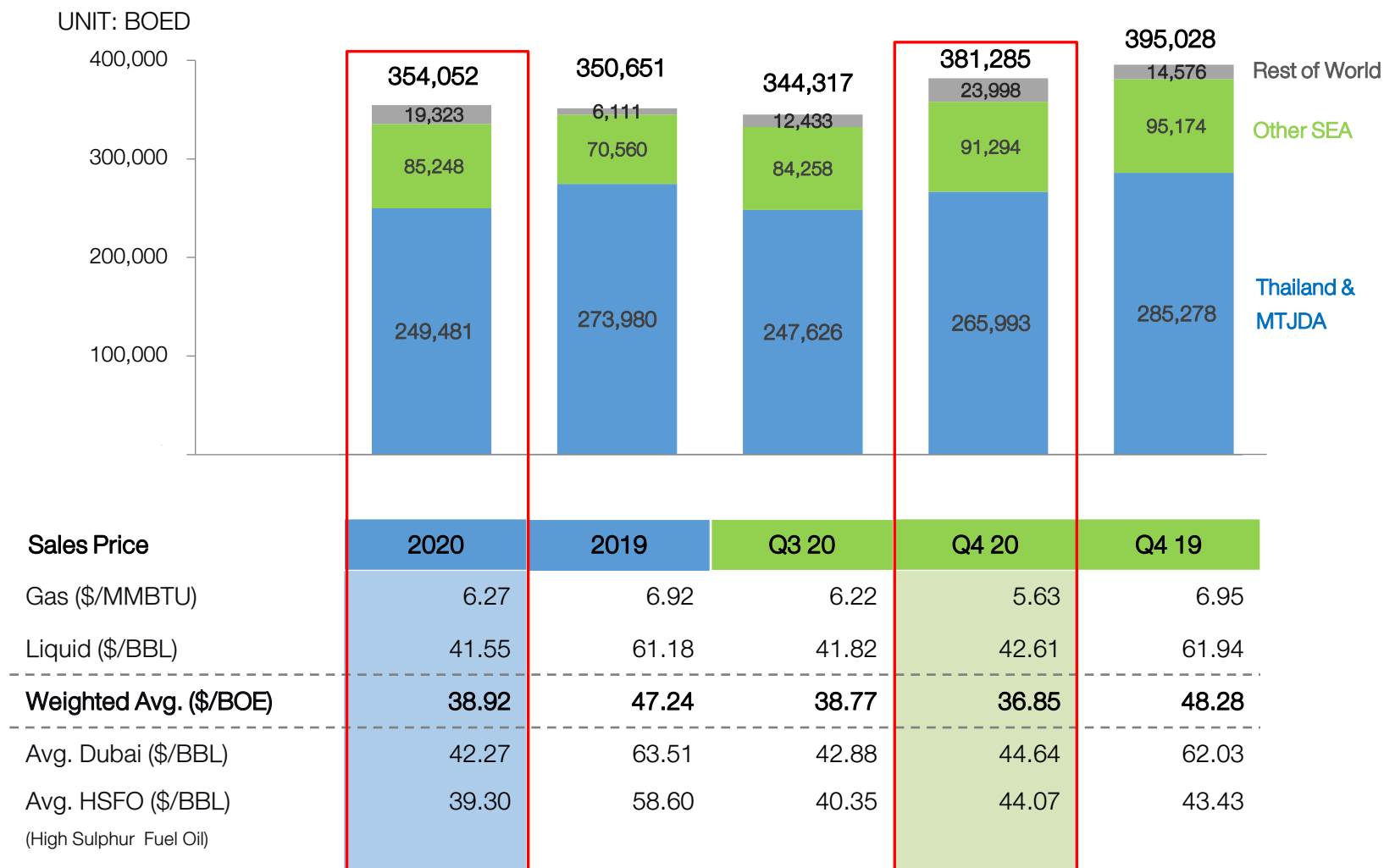
**Major items: Non-recurring Net Income - Increase (Decrease) from**

Tax from Effect of FX	(95)	150	(>100%)	10	(2)	>100%	42	(76%)
Oil Price Hedging	112	(45)	>100%	(38)	10	(>100%)	(25)	(52%)
Effect from FX*	16	28	(43%)	(26)	29	(>100%)	9	(>100%)
Impairment Loss on Assets	(91)	-	(100%)	(44)	-	(100%)	-	(100%)

\* Consisted of Gain/(Loss) on FX and Forward Contract

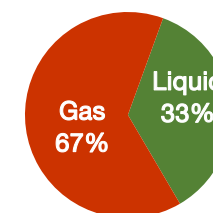
# Results – Sales Volume and Avg. Selling Price

Solid volume growth from Murphy and Partex, offset with low demand in Gulf of Thailand

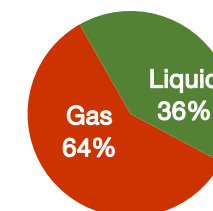


## 2020 Sales Volume & Revenue By Product

### Volume Mix



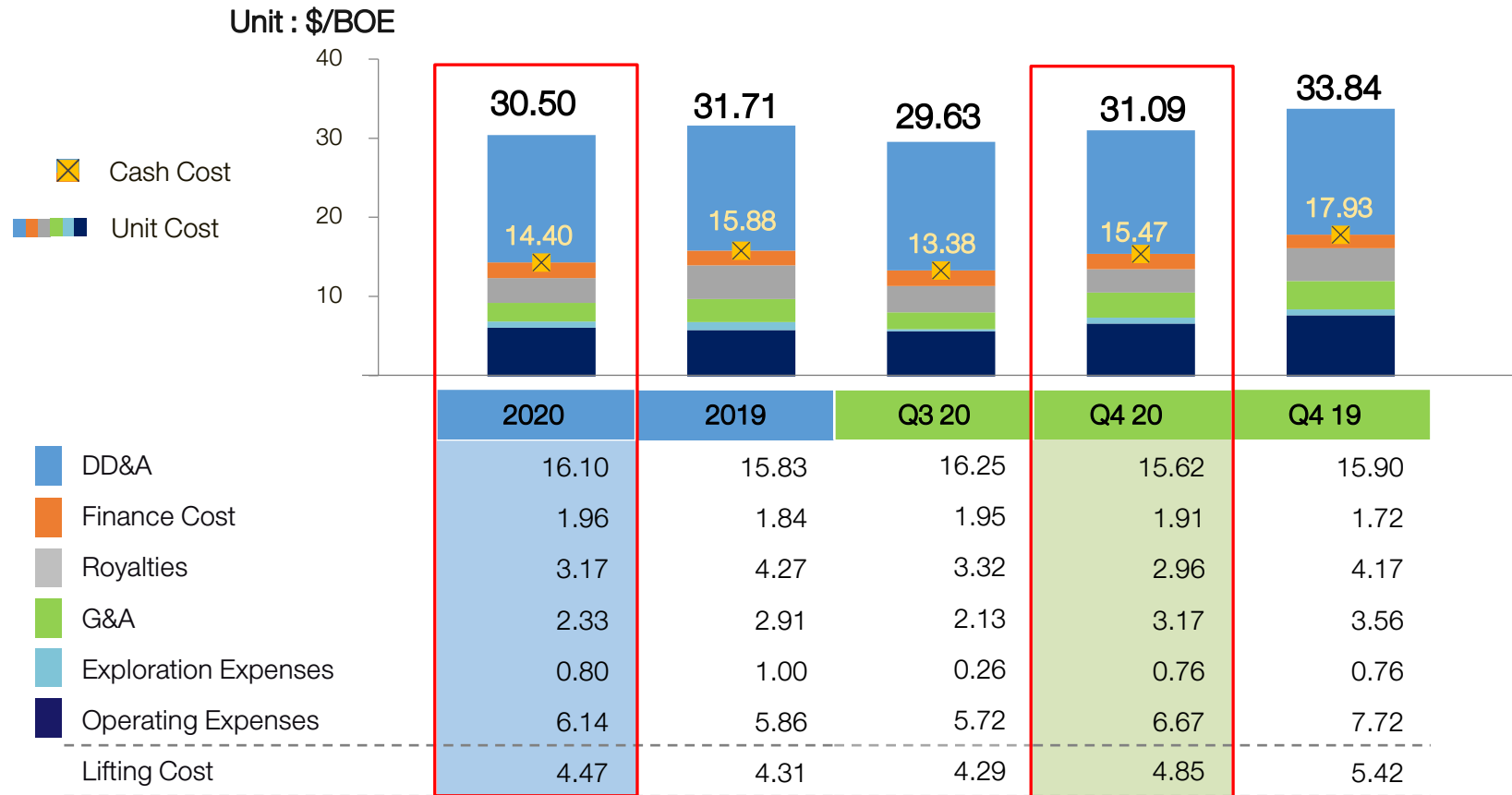
### Revenue Mix



Note: Include sales volume from ADNOC Gas Processing (AGP)

# Results – Unit Cost

Maintain cost at competitive level



Note: Unit Cost per 2020 Financial Statements has applied Thai Financial Reporting Standard No. 16 (TFRS 16: Lease), effective 1 Jan 2020

All Unit Cost shown above exclude costs related to new business

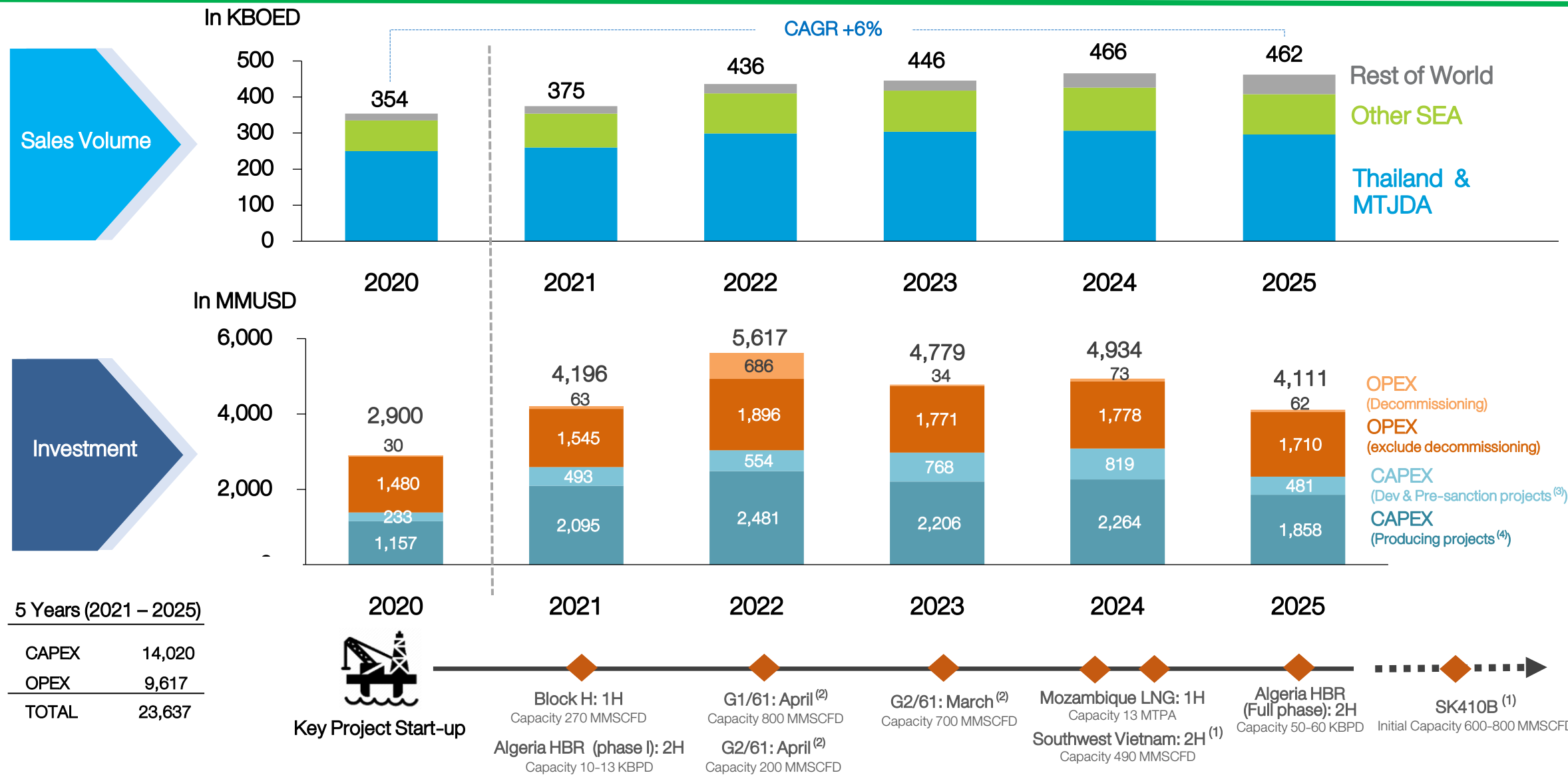
The formulas for calculating ratios are provided in the supplementary section for your reference



# Five –Year Plan : Sales Volume *(not including Oman Block 61)*



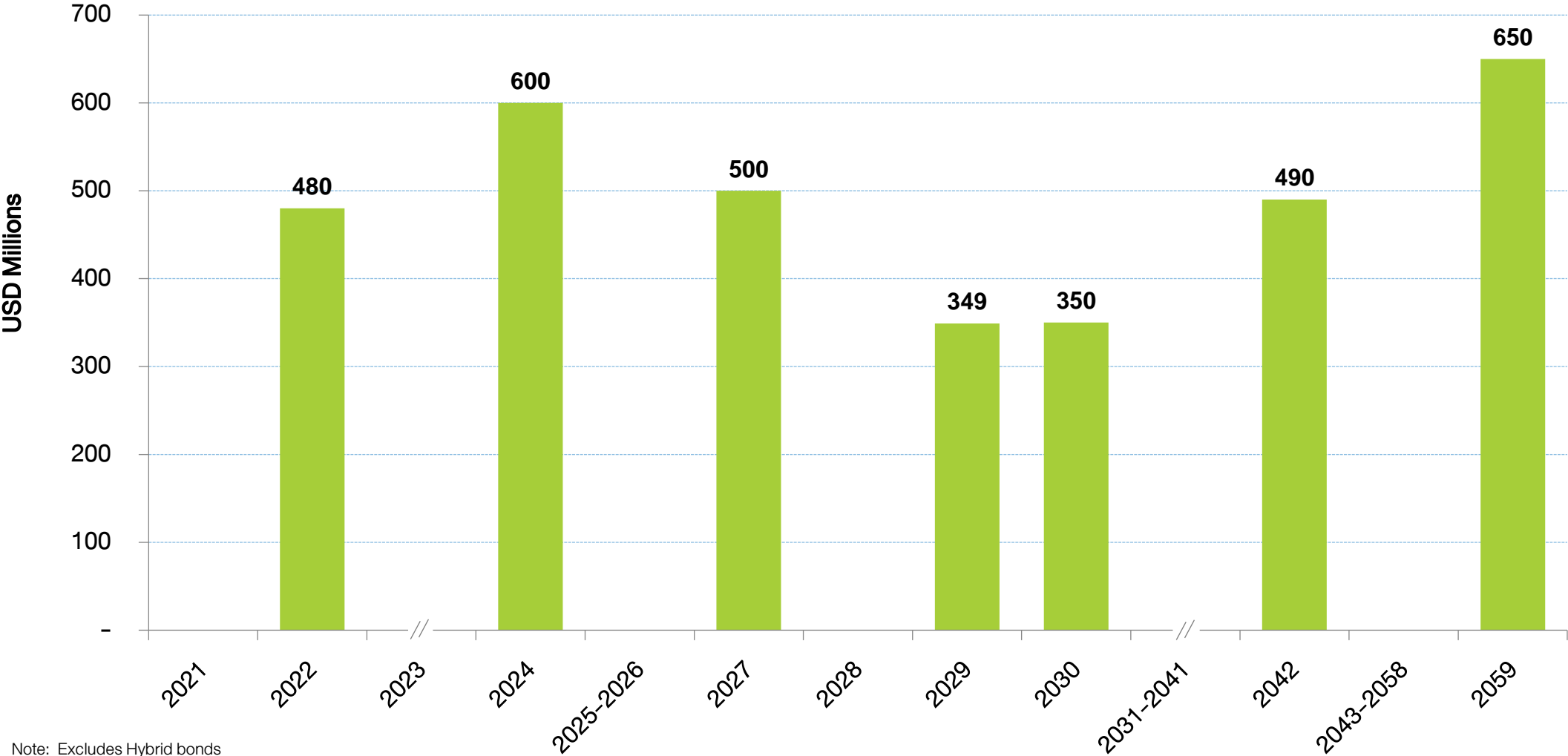
Maximize value of existing assets, accelerate G1/G2 transitions & maintain key milestones for key projects



Note: <sup>(1)</sup> Subject to regulatory approval and FID timing <sup>(2)</sup> According to Production Sharing Contracts signed on 25 February 2019 <sup>(3)</sup> Development & Pre-sanction projects include Mozambique LNG , Algeria HBR, SK410B, and Southwest Vietnam <sup>(4)</sup> Includes exploration and appraisal in all projects and head office CAPEX

# Debt Maturity Profile

As of January 2021



Note: Excludes Hybrid bonds

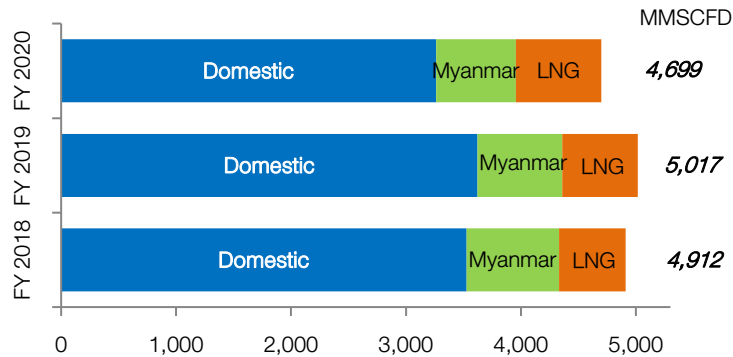
Unit: USD Millions or equivalent after cross currency swap

# Thailand Energy Updates and FX rates

Domestic gas volume suppressed by LNG import; THB fluctuation continues

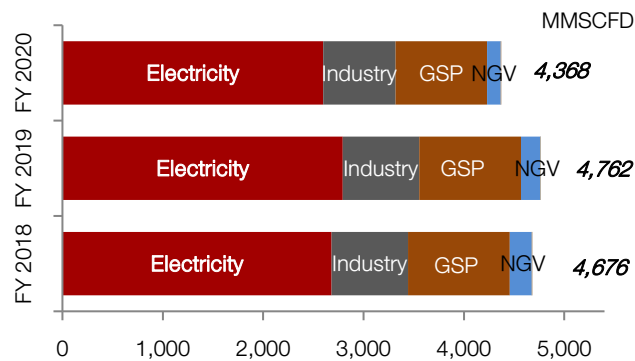
## Thailand Energy Overview

### Natural Gas Supply



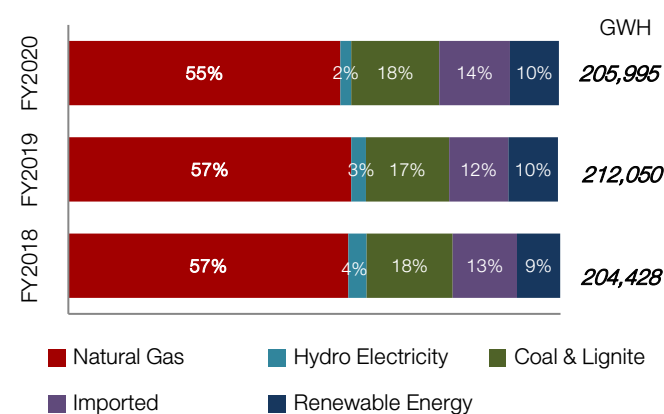
- Lower energy demand from COVID-19 outbreak
- More LNG imports from low LNG spot prices
- Slight decline from Myanmar piped gas imports due to natural decline

### Natural Gas Consumption

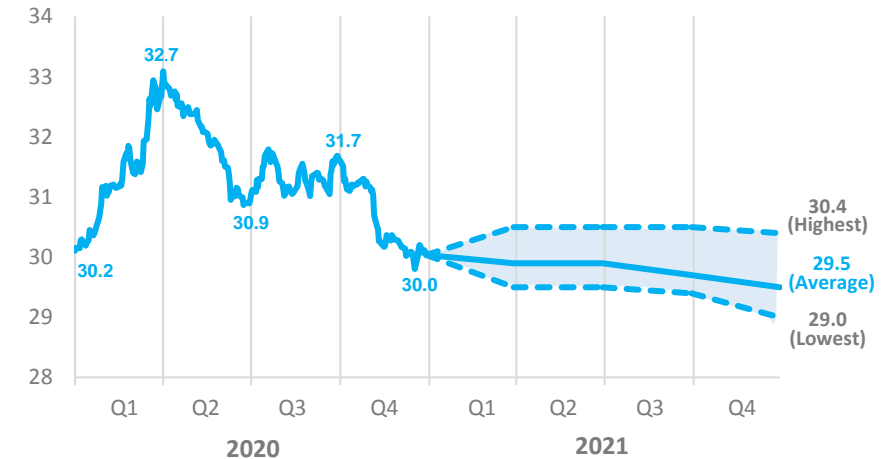


Source: EPPO

### Electricity Generation



## Exchange Rate Movement (THB/USD)



### Consensus on the exchange rate mostly depends on

- Positive COVID-19 vaccine development news despite vaccine distribution challenges and capital inflows to emerging markets
- The recovery of tourism sector in Thailand and global economic recovery
- Concerns on political uncertainty and the new wave of COVID-19 outbreak in Thailand
- Measures equipped by Bank of Thailand to prevent THB appreciation

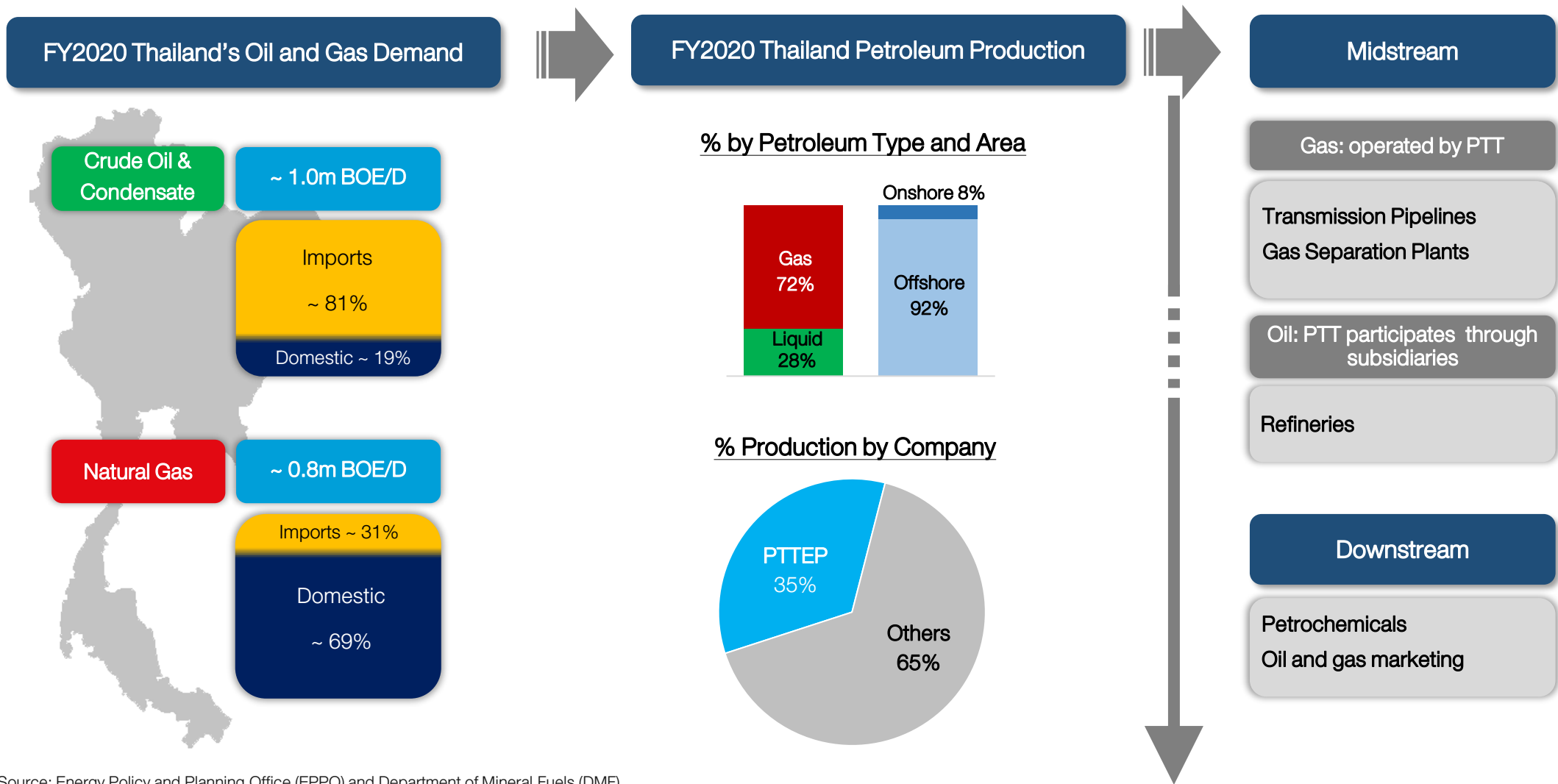
Source: Bank of Thailand, Bloomberg

Forecast based on Bloomberg Consensus as of 4 February 2021



# Thailand's Energy Value Chain

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

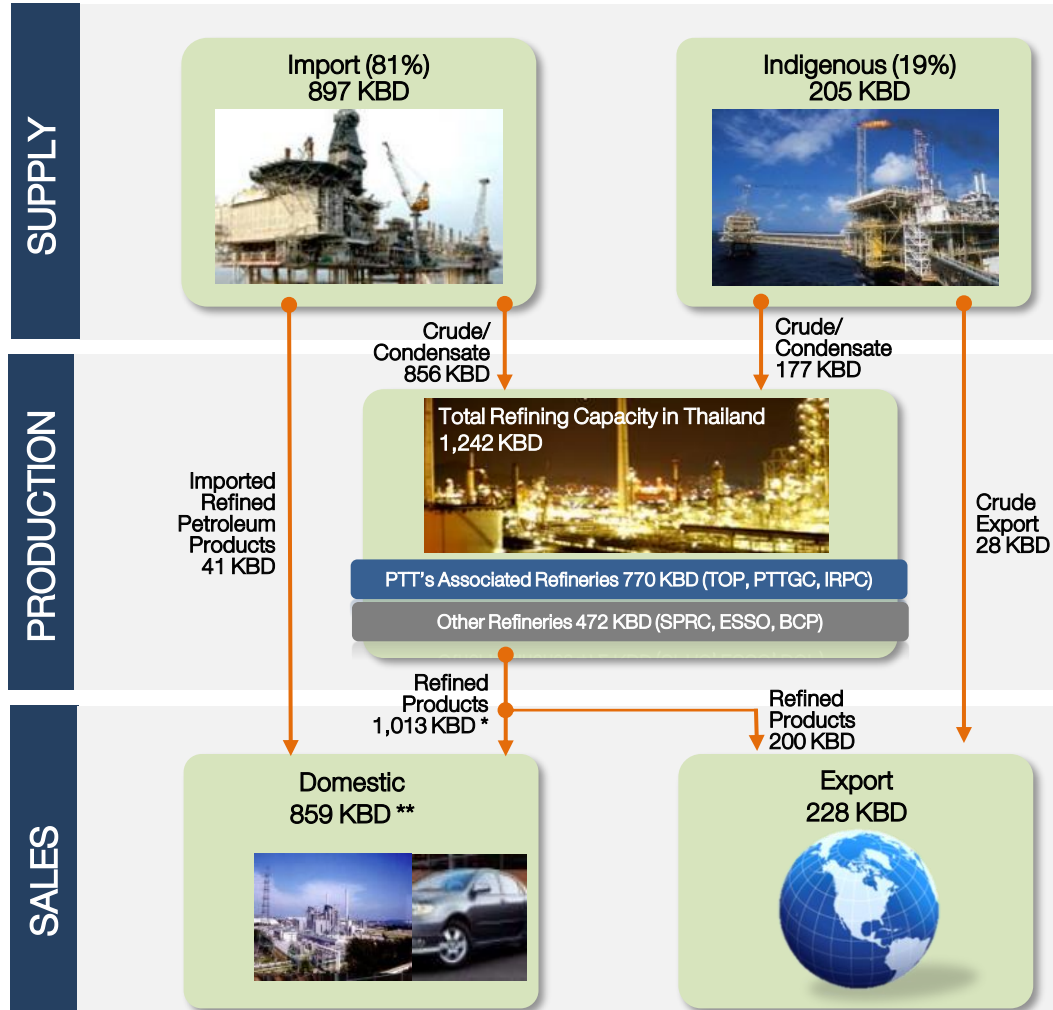


Source: Energy Policy and Planning Office (EPPO) and Department of Mineral Fuels (DMF)

# Thailand's Oil and Gas Balance

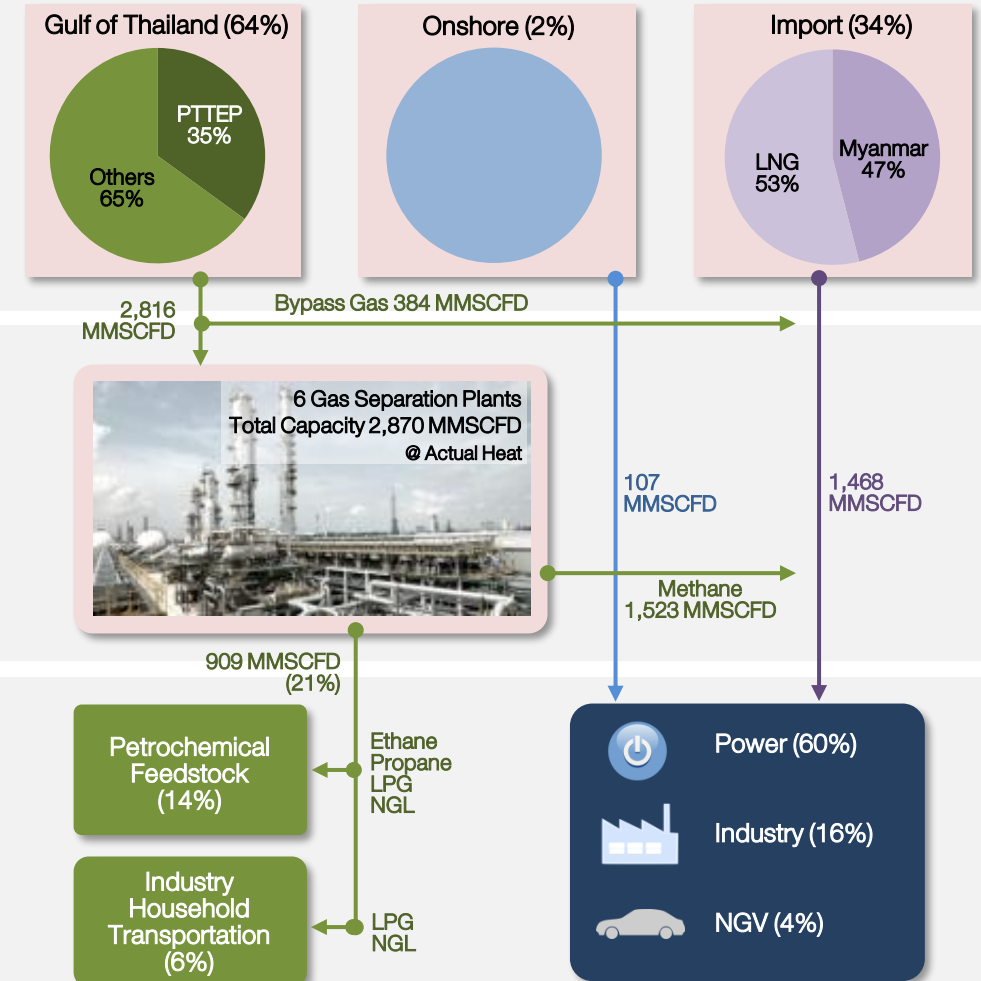
## Oil Balance\*\*\*

Maintains stability supply through adequate refining capacity



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

Main driver of the Thailand economy



Source: PTT

Note: \* Refined product from refineries = 944 KBD, including domestic supply of LPG from GSPs and Petrochemical Plants = 95 KBD

\*\* Not included Inventory

\*\*\* Information as of 9M20

\*\*\*\* Information as of 12M20

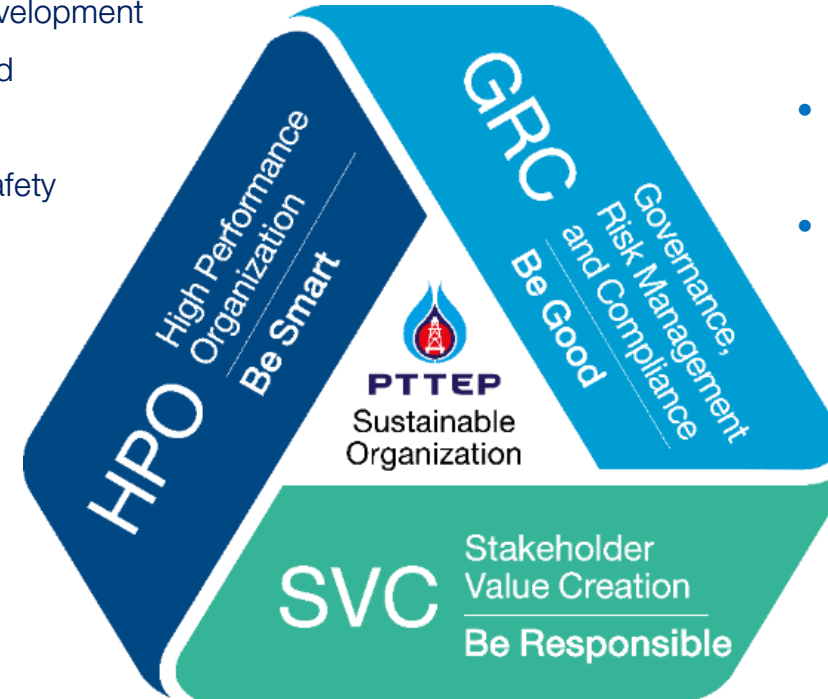
MMSCFD @ Heating Value 1,000 Btu/ft<sup>3</sup>

## “Energy Partner of Choice”

through competitive performance and innovation  
for long-term value creation



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



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

- GHG\* Reduction
- Circular Model for E&P
- Ocean for Life

Note: \* GHG: Greenhouse Gas



# HPO: Strategies for long-term sustainability

Focus on “Execute” while monitoring M&A Opportunity

## Value Creation from Existing Assets



### Development

#### Mozambique Area 1

On track to deliver first LNG



### Pre-Development

#### SK410B : Lang-Lebah

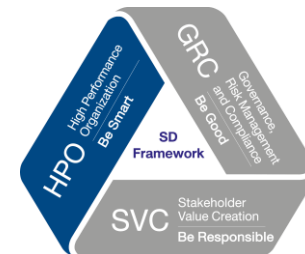
Strong path towards FID



## Transition of New Assets



- ▶ Operatorship transfer for G1/61
- ▶ Gulf of Thailand capital & operational efficiencies and synergy
- ▶ Increase efficiency and annexation to create more value in Malaysia



## EXPAND: M&A and New Businesses

Opportunistic M&A in Strategic Areas



Transitioning technology and product builder to Business Builder



**Gas to Power**

Integrated energy solution and enhancing value of existing assets

### Legacy Assets

Sustain sales volume as committed

**Cost Management**

Explore full potential in Malaysia and Myanmar

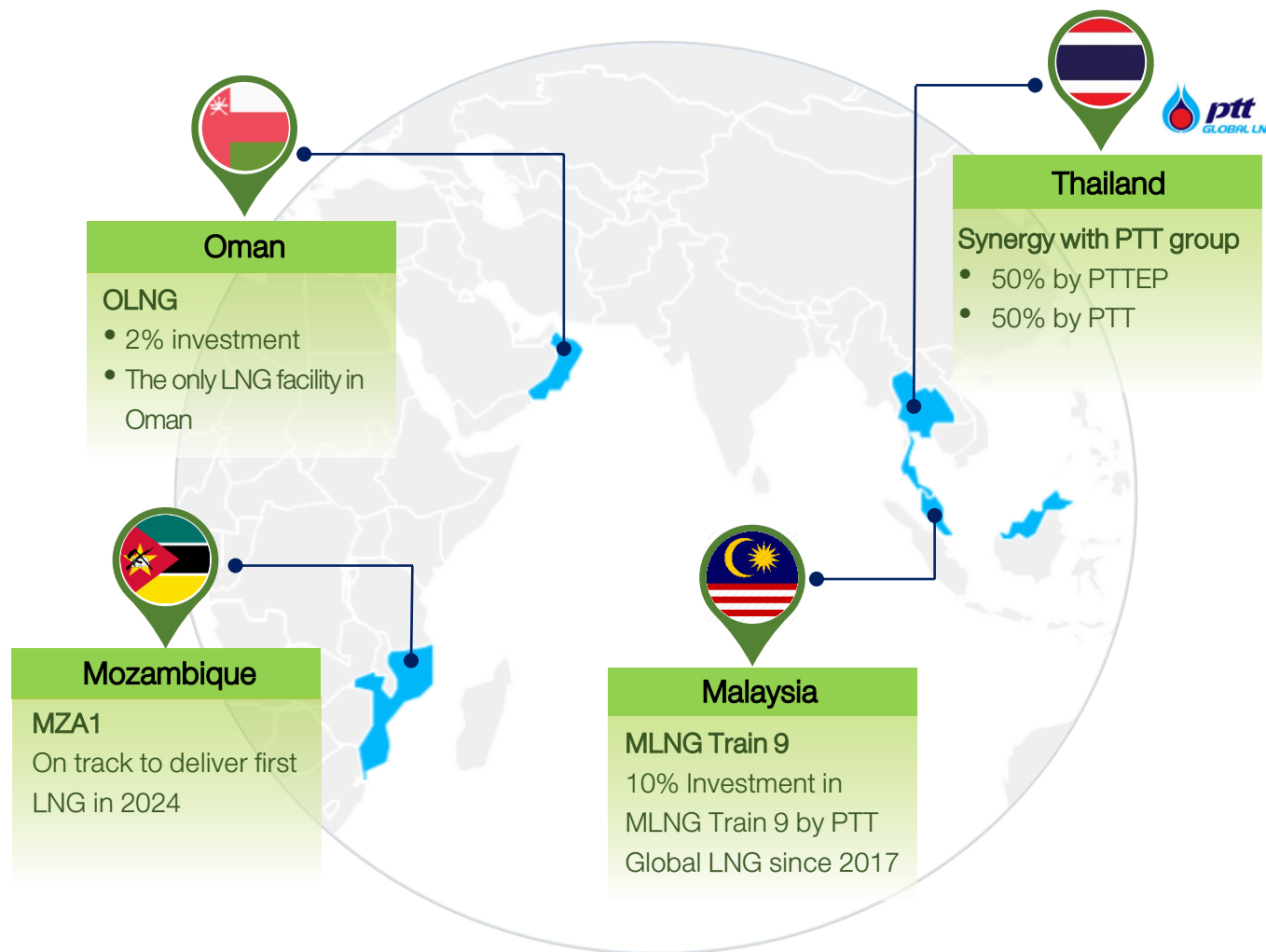
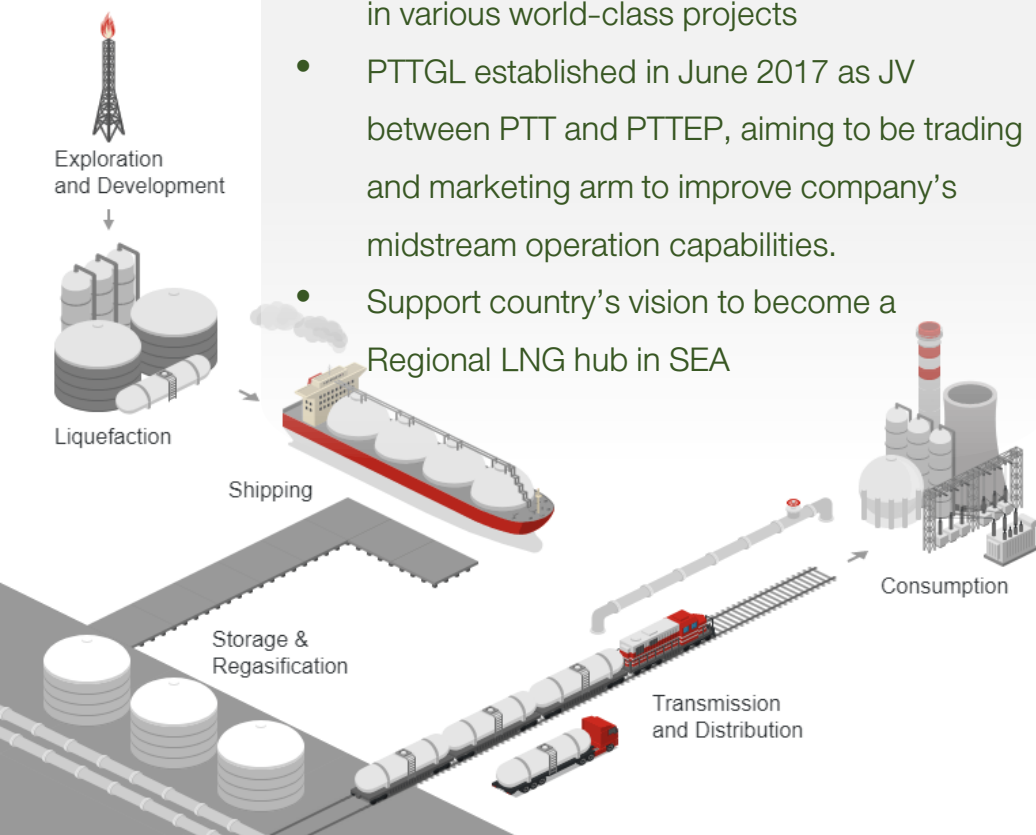
**Operation Continuous**

Streamline Cost Structure for efficiency

**Exploration**

## LNG Value Chain\*

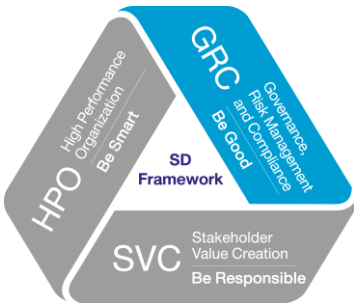
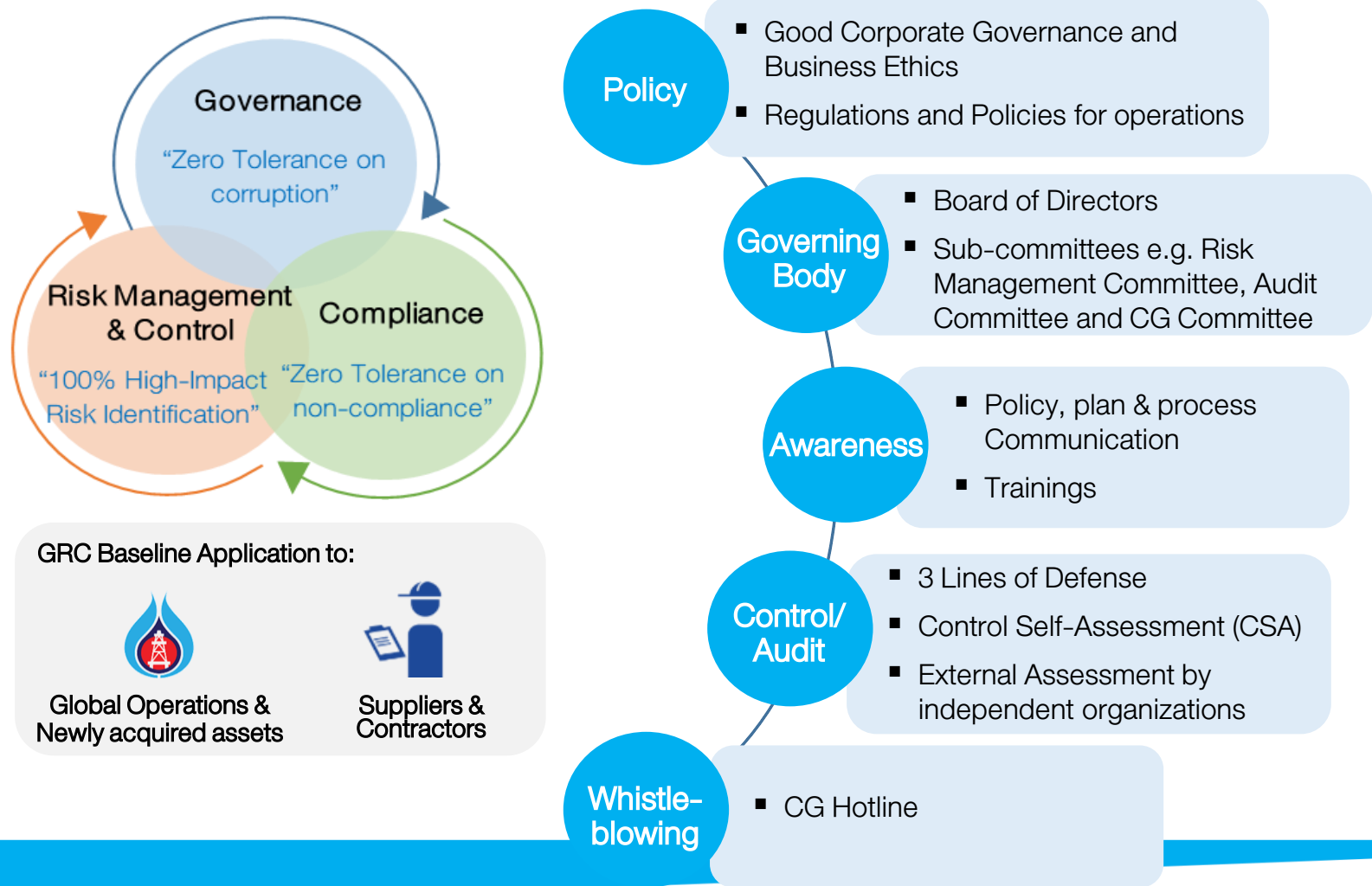
- PTTEP has put footprints in LNG value chain through upstream and midstream liquefaction in various world-class projects
- PTTGL established in June 2017 as JV between PTT and PTTEP, aiming to be trading and marketing arm to improve company's midstream operation capabilities.
- Support country's vision to become a Regional LNG hub in SEA



\*Strategic fit to PTT Group LNG value chain : Regional LNG hub

\*LNG Value Chain : Upstream, Liquefaction, Shipping and Regasification

## How do we ensure GRC?



## STOP Anti corruption



## Human rights



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



# Stakeholder Value Creation – ESG targets



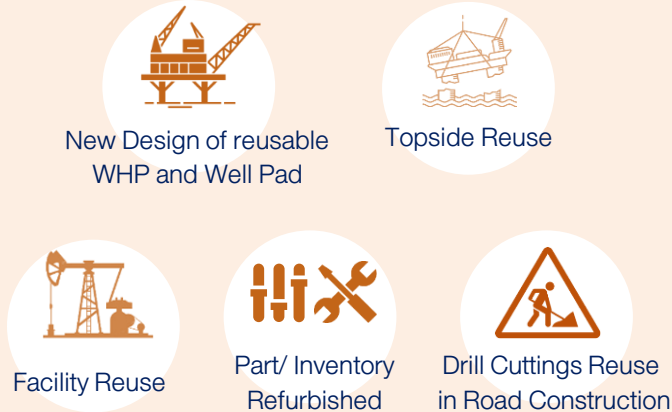
## GHG\* Reduction

Growing business,  
while decreasing GHGs emission



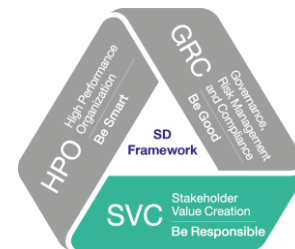
## Circular Model for E&P

Maximize resource efficiency and  
zero waste to landfill



## Ocean for Life

Improve biodiversity and  
local wealth



### 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

# Awards on Sustainable development

Pursue long-term growth with social and environmental wellness



Now a Part of **S&P Global**

A member of Down Jones  
Sustainability Indices (DJSI) for  
7<sup>th</sup> Consecutive year in 2020



## Proven business integrity

Role Model Organization on Human Rights Award 2020  
*The Department of Rights and Liberties Protection,  
Ministry of Justice*

NACC Integrity Award 2019  
*The National Anti-Corruption Commission (NACC)*

Asia's Icon on Corporate Governance 2019 Award  
*Corporate Governance Asia magazine*



FTSE4Good

A member of FTSE4Good  
Emerging Index Series for  
the 5<sup>th</sup> Consecutive year in 2020



## Exemplary social contributor

3G Best Social Empowerment Award 2020  
*Global Good Governance Awards  
IF Analytica*

Global CSR Award 2020 (Platinum Winner)  
*The Energy and Environment Foundation  
Global CSR Awards*

Best CSR Organizer 2019  
*BAZNAS of Indonesia  
(The National Zakat Board)*



A member of THSI for  
the 5<sup>th</sup> Consecutive year in 2020



## 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)*

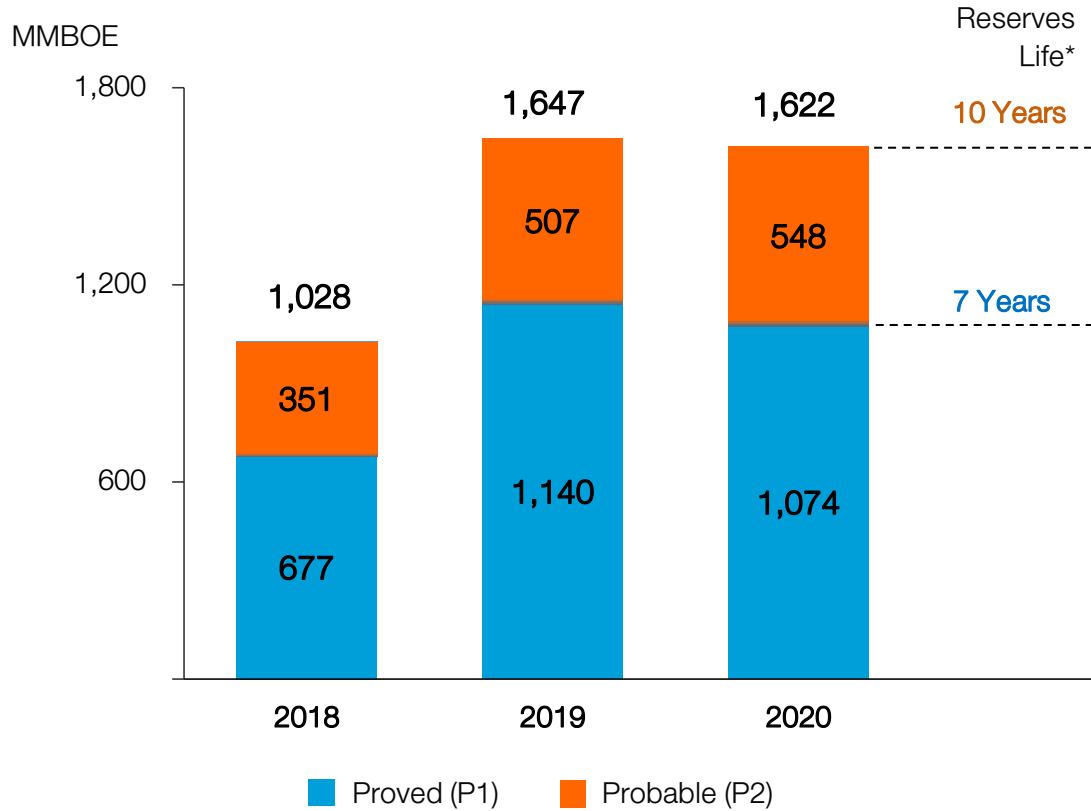


Communication on Progress (CoP)  
Advanced Level



# Reserves at the Year-end 2020 *(not including Oman Block 61)*

Sustained reserve life at 7 years target

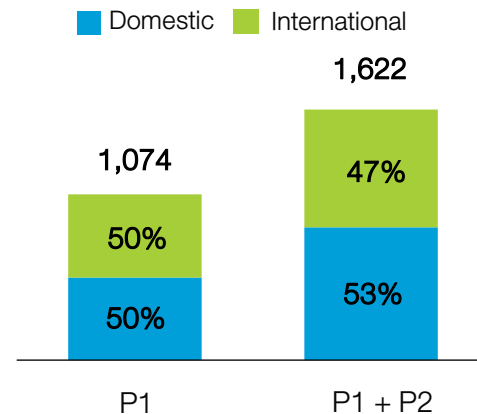


5-Year Average Proved Reserves Replacement Ratio (RRR)

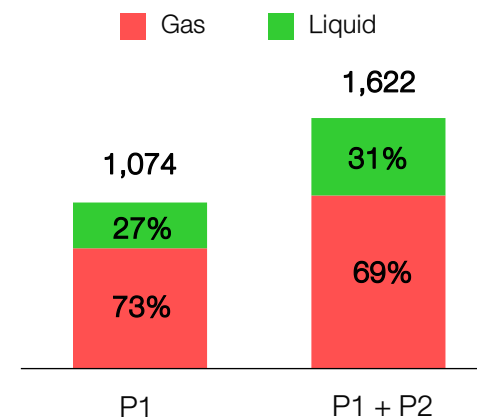
2018	2019	2020
0.7x	1.5X	1.5X

- Based on total production of natural gas, condensate, and crude oil (including LPG) of 422 KBOED for the year ended December 31, 2020
- Figures include reserves from equity method

## 2020 by Geography



## 2020 by Product Type





## Central Asia

### *First presence in Kazakhstan:*

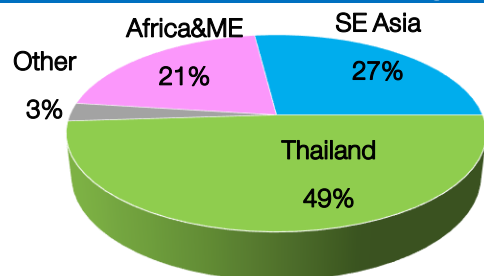
- Production: Dunga onshore oil field from the acquisition of Partex in 2019

## North & South America

### *Opportunities in an early phase:*

- Deepwater exploration in Brazil and Mexico with prominent and prudent operators

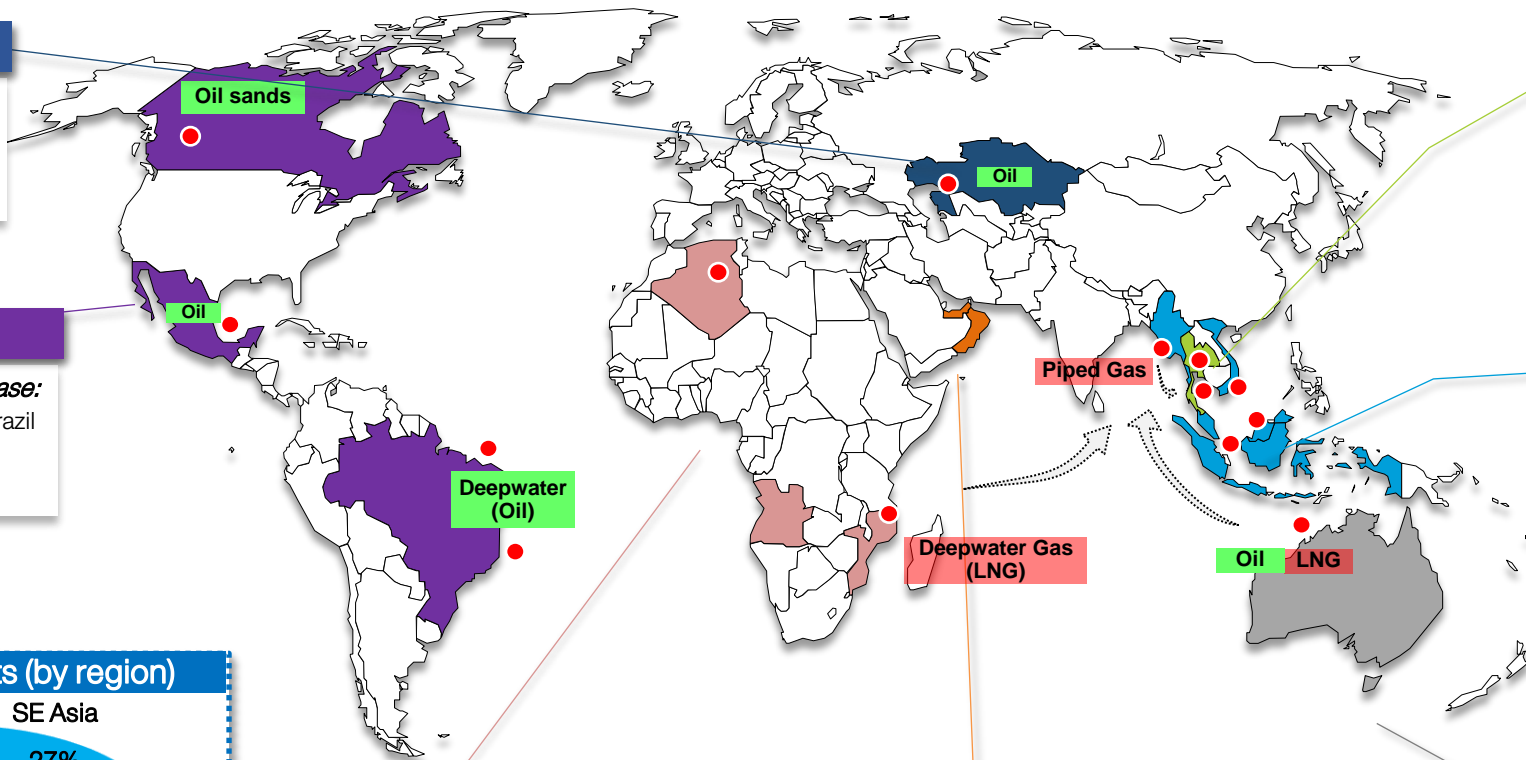
## Book Value of Assets (by region)



As of Dec 2020 (not including Oman Block 61)

**Total Assets USD 22.5 billion**

Information as of 31 December 2020



## Thailand

### *PTTEP's core production base*

- 70% 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*

- 24% 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 17 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:*

- 3 offshore exploration blocks partnered with experienced operator, ENI in 2019-2020
- 3 onshore blocks including PDO (Block 6), the largest producing oil asset in Oman

## Australasia

### *Potential gas development*

- Sizable undeveloped gas resources in Timor Sea

# 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 780 MMSCFD and 22 KBPD in 2020

### S1 (100% WI)

- The largest onshore crude oil production field in Thailand with 2020 average crude oil sales volume of 29 KBPD

### Arthit (80% WI)

- Average sales volume in 2020 was 223 MMSCFD of natural gas and 11 KBPD of condensates

### Contract 4 (60% WI)

- Average sales rate of 329 MMSCFD for natural gas and 13 KBPD for condensate in 2020

## Myanmar

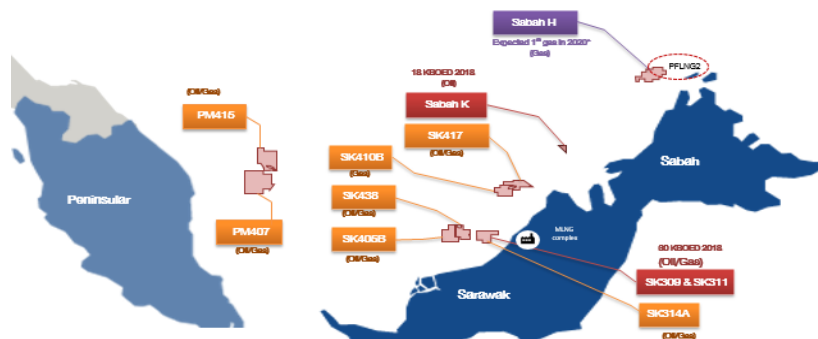


- 3 producing gas fields supplying gas to both Thailand and Myanmar: Yadana, Yetagun, and Zawtika
- Operate Zawtika project, brought online in March 2014 with current gas supply of 317 MMSCFD in 2020

### Project Status

Production	<ul style="list-style-type: none"> <li>• Zawtika (80% WI)</li> <li>• Yadana (25.5% WI)</li> <li>• Yetagun (19.3% WI)</li> </ul>
Appraisal	<ul style="list-style-type: none"> <li>• M3 (80% WI)</li> </ul>
Exploration	<ul style="list-style-type: none"> <li>• MD-7 (50% WI)</li> </ul>

## 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 2020 was 25\* KBPD of crude oil and 28\* MMSCFD of natural gas

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

For East Patricia field (42% WI)

- Average production volume in 2020 was 190\* MMSCFD of natural gas and 20\* KBPD of condensates and crude.

#### Block H Project\* :

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

- First gas early February 2021
- Full capacity at 270 MMSCFD

### Exploration

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

- Multi TCF significant discovery
- Expected Final Investment Decision (FID) announcement in 2022

#### Other projects

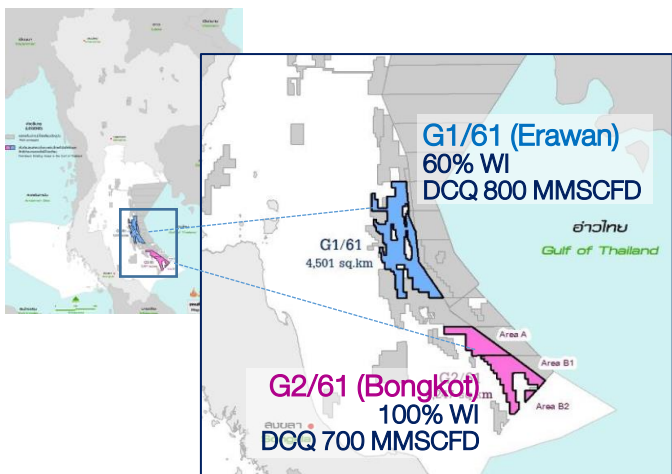
- Evaluating petroleum potentials
- Plan for exploration and appraisal drilling in 2021

\* The average production volumes per day, For Block K, gross production is net off utilization

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



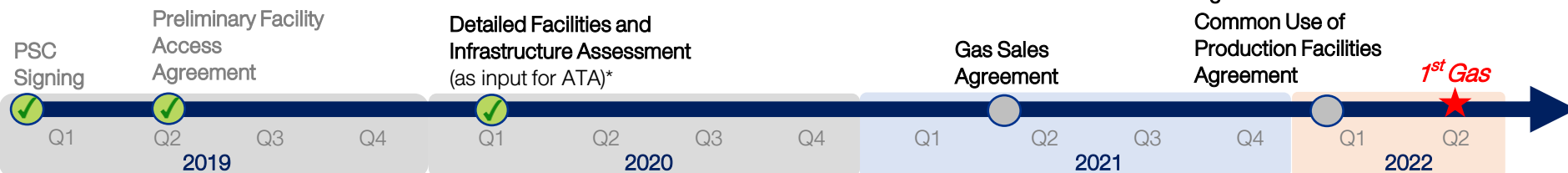
## Generating strong cash flow

- 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



## Concrete transition plan:



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

Source : TOR

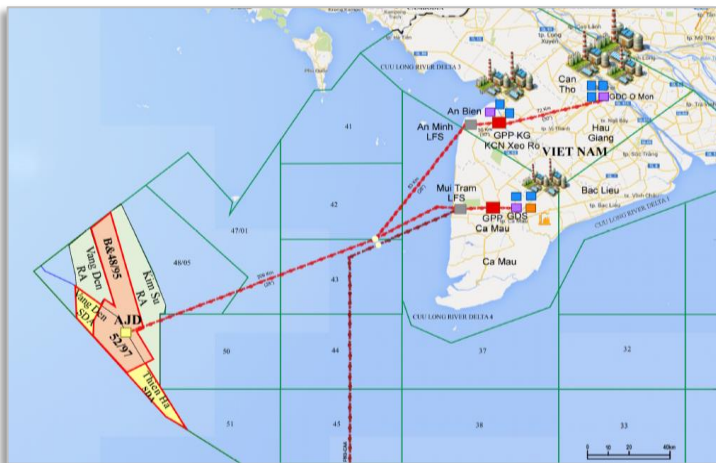
G1/61 800 MMSCFD 2022  
G2/61 200/700 MMSCFD 2022/2023



# Other South East Asia countries

Expanding foothold in the region

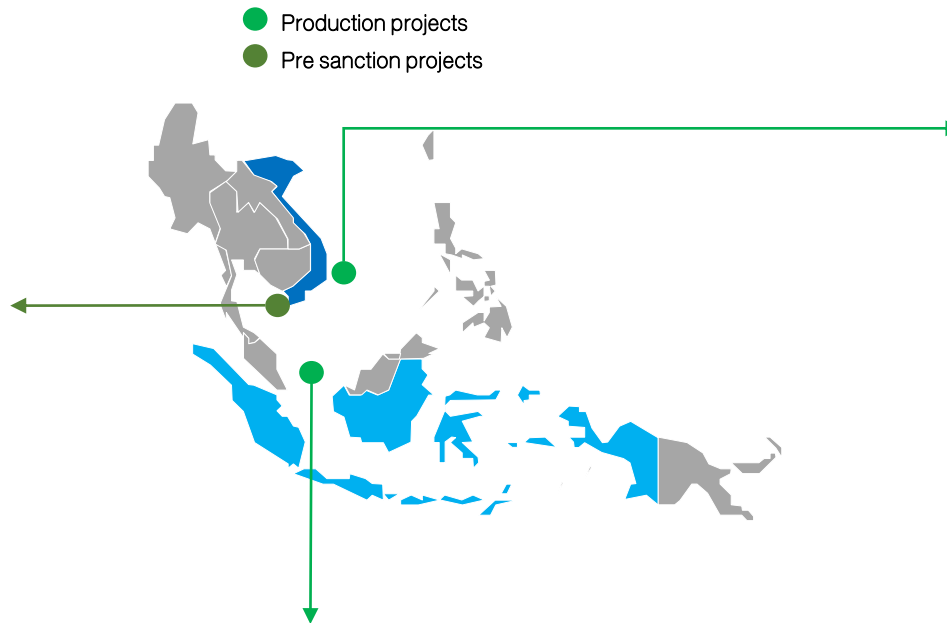
## Vietnam and Indonesia



### 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 13 KBPD in 2020
- The project is preparing the drilling of additional development wells in order to maintain the production level in 2021.

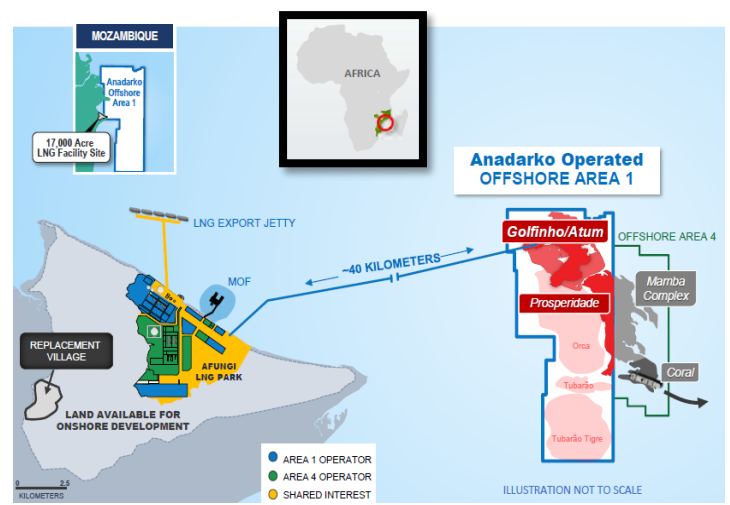


### Natuna Sea A (11.5% WI)

- Average sales volume of natural gas was 205 MMSCFD in 2020

# Mozambique Area 1

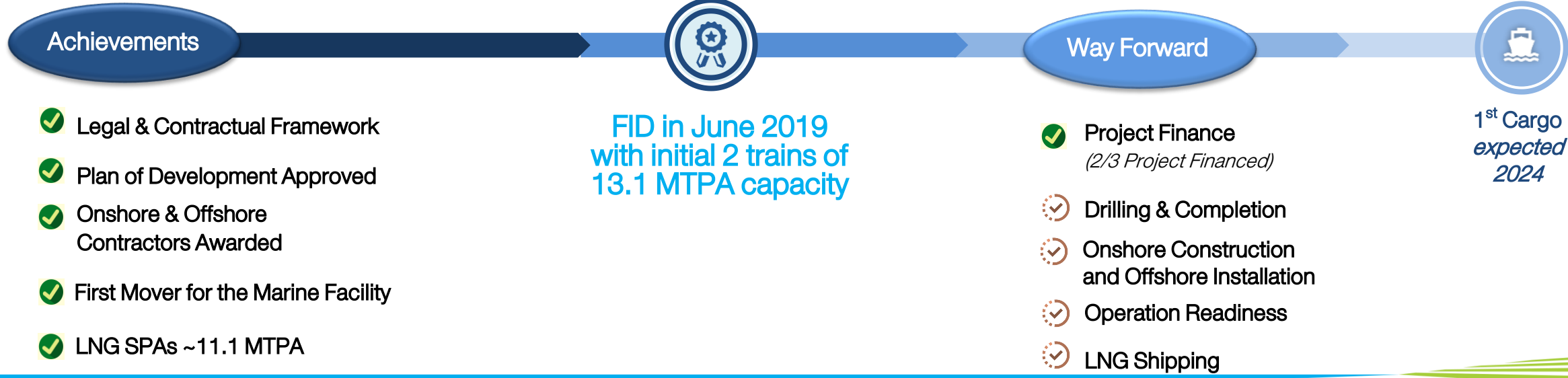
FID in 2019, on the path of unlocking value from world class LNG asset



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

### Location and Cost Advantage

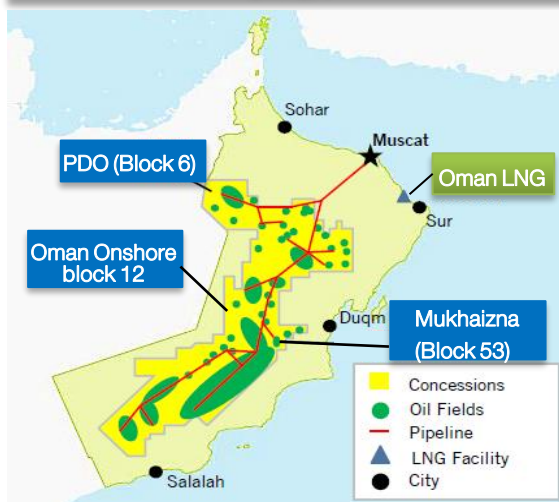
- Close proximity to shore
- High quality reservoirs  
*capable of flow up to 200 mmcf/d per well*
- Access to Asian and European markets



# The Middle East

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 volume: 601,264 BPD (69% of Oman production)
- Operated by Petroleum Development of Oman (Joint Operating Company)

### Mukhaizna (Block 53)

- Largest single onshore producing field in Oman
- Oil production volume: 90,734 BPD (10% of Oman production)
- Operated by Occidental Petroleum (47% interest)

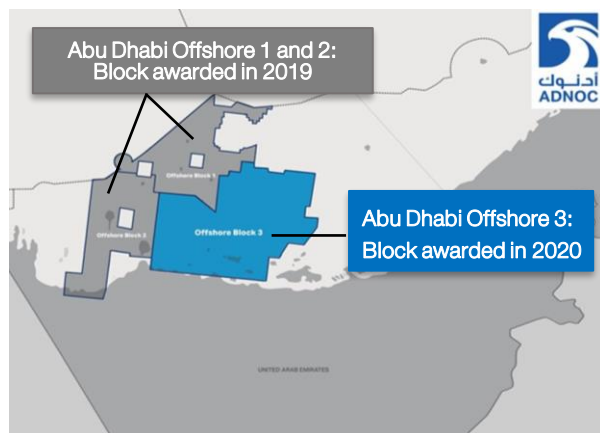
### Block 12

- Located onshore central part of the Sultanate of Oman
- Signed agreement with Oman's Ministry of Oil and Gas (MOG) for exploration and production rights in February 2020
- Operated by Total E&P Oman Block 12 B.V. (80% interest)

### Oman LNG

- The only LNG facility in Oman
- Processing capacity 10.4 MTPA
- Contracted LNG sales to international buyers: Japan and South Korea
- Government of Oman 51% (Operator)

## UAE



### Abu Dhabi Offshore 1,2 and 3

- High potential prospective resources with significant sizeable discoveries
- Located North-west of Abu Dhabi Emirates, United Arab Emirates
- Granted the award for exploration in January 2019 - 2020
- Operated by Eni Abu Dhabi B.V. (70% interest)

### 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
- Operated by ADNOC (68% interest)





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

## Deep Water Brazil



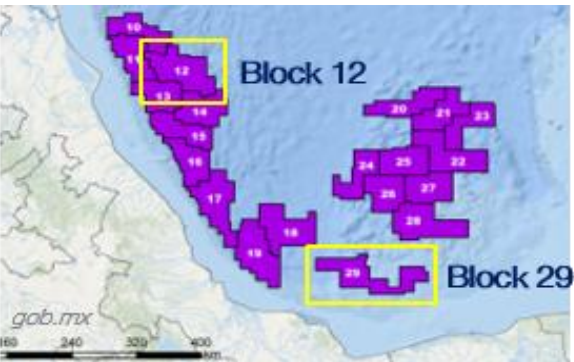
### Barreirinhas AP1

- 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
- Currently waiting for exploration wells drilling permit from the government

### BM-ES-23

- Acquired 20% interest from Shell in Q3 2014
- Partnered with Petrobras (65%, operator) and INPEX (15%)
- Currently evaluating the petroleum potential for further development

## Gulf of Mexico, Mexico



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

### Mexico block 12 (2.4)

- Non-operating partner with 20% participating interest
- Located in the Mexican Ridges, western Gulf of Mexico
- Currently evaluating petroleum potential and preparing for an exploration well drilling in 2021

### Mexico block 29 (2.4)

- Non-operating partner with 16.67% participating interest
- Located in the Campeche, southern Gulf of Mexico
- Made two successful deep-water oil discoveries with good quality reservoirs in May 2020
- Currently working on obtaining approval of the appraisal plan from the Mexican regulators and preparing appraisal process in 2021 as well as further development plans

# 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)	<div> <div>Petronas</div> <div>65%</div> <div></div> </div> <div> <div>JX Nippon</div> <div>10%</div> <div></div> </div> <div> <div>PTT Global LNG</div> <div>10%</div> <div></div> </div> <div> <div>Sarawak State</div> <div>10%</div> <div></div> </div> <div> <div>Sabah State</div> <div>5%</div> <div></div> </div>

## 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

	Project	Status*	Phase	PTTEP's Share	Partners <i>(as Dec 2020)</i>	2020 Average Sales Volume **		2021 Key Activities
						Gas (MMSCFD)	Liquid (KBPD)	
Thailand and JDA								
1	Arthit	OP	Production	80%	Chevron MOECO 16% 4%	223	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	25.001%	Chevron MOECO 51.66% KrisEnergy 16.71% Palang Sophon 4.63% 2%	51	17	<ul style="list-style-type: none"><li>• Drill development wells</li><li>• Reuse Wellhead platform Study</li></ul>
4	Bongkot	OP	Production	66.6667%	TOTAL 33.3333%	780	22	<ul style="list-style-type: none"><li>• Drill development wells</li><li>• Maintained production level as planned</li><li>• Prepare for decommissioning activities</li></ul>
5	Contract 3 <i>(Formerly Unocal III)</i>	JV	Production	5%	Chevron MOECO 71.25% 23.75%	567	34	<ul style="list-style-type: none"><li>• Prepare for decommissioning activities</li></ul>
6	Contract 4 <i>(Formerly Pailin)</i>	JV	Production	60%	Chevron MOECO 35% 5%	329	13	<ul style="list-style-type: none"><li>• Ensure gas deliverability level at DCQ***</li><li>• Drill development wells</li><li>• Topside reuse</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 51% 21.25% Palang Sophon 6.375%	1	4	<ul style="list-style-type: none"><li>• Total Reuse for new platforms</li></ul>
9	G4/48	JV	Production	5%	Chevron MOECO 71.25% 23.75%	6	0.464	<ul style="list-style-type: none"><li>• Prepare for decommissioning activities</li></ul>
10	L53/43 & L54/43	OP	Production	100%		-	1	<ul style="list-style-type: none"><li>• Maintain production plateau</li><li>• Drill development wells</li><li>• Prepare for decommissioning activities</li></ul>
11	PTTEP1	OP	Production	100%		-	0.135	<ul style="list-style-type: none"><li>• Drill a development well</li><li>• Maintain production plateau</li><li>• Prepare for decommissioning activities</li></ul>
12	S1	OP	Production	100%		7	Crude:29 KBPD LPG: 0.182 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**** 35% ExxonMobil 10%	94	0.283	<ul style="list-style-type: none"><li>• Ensure gas deliverability</li><li>• Drill development wells</li><li>• Negotiate and Finalize GSA</li></ul>

\* Status: OP = PTTEP operatorship / JOC = PTTEP joint operatorship / JV = PTTEP as 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 Dec 2020)	2020 Average Sales Volume **		2021 Key Activities
						Gas (MMSCFD)	Liquid (KBPD)	
Thailand and JDA								
14	L22/43	OP	Production	100%		-	-	<ul style="list-style-type: none"><li>Resume production once project economic becomes viable</li><li>Continue decommissioning preparation</li></ul>
15	MTJDA	JOC	Production	50%	Petronas-Carigali 50%	265	7.5	<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>Development study</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>
Others SEA								
1	Malaysia	OP (except Gumusut-Kakap (GK) in Block K)	Production/ Exploration/ Development	6.4-80% (varied by permits)		SK309 and SK311 190 Block K 25	SK309 and SK311 20 Block K 28	<ul style="list-style-type: none"><li>Production projects(SK309 and SK311, Block K): infill development</li><li>Block H: first gas expected in the earliest opportunity in 2021</li><li>Sarawak SK410B:Start Front End Engineering Design (FEED)</li><li>Other exploration projects: drill exploration wells and perform 3D seismic activities</li></ul>
2	Yadana	JV	Production	25.5%	TOTAL 31.24% Chevron 28.26% MOGE 15%	761	-	<ul style="list-style-type: none"><li>Drill production wells</li><li>Ensure gas deliverability level at DCQ***</li></ul>
3	Yetagun	JV	Production	19.3178%	Petronas-Carigali 40.91018% MOGE 20.4541% Nippon Oil 19.3178%	55	1.1	<ul style="list-style-type: none"><li>Maintain production level</li><li>Refinery Acid Gas Removal Unit (AGRU) Project and facilities modification</li></ul>
4	Zawtika (M9 & a part of M11)	OP	Production	80%	Myanma Oil and Gas Enterprise (MOGE) 20%	317	-	<ul style="list-style-type: none"><li>Ensure gas deliverability level at DCQ***</li><li>Drill appraisal wells</li><li>Continue Pre-development works</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>Block relinquish</li></ul>
7	Myanmar MD-7	OP	Exploration	50%	TOTAL 50%			<ul style="list-style-type: none"><li>Complete the termination process</li><li>Finish leftover material transferring to MOGE</li></ul>
8	Myanmar MOGE 3	OP	Exploration	77.5%	Palang Sophon 10% MOECO 10% WinPreciousResources 2.5%			<ul style="list-style-type: none"><li>Complete the termination process</li><li>Finish leftover material transferring to MOGE</li></ul>

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

\*\* Sales volume stated at 100% basis/ For Block K, gross production is net off unitization

\*\*\* DCQ = Daily Contractual Quantity



	Project	Status*	Phase	PTTEP's Share	Partners (as Dec 2020)		2020 Average Sales Volume **		2021 Key Activities
							Gas (MMSCFD)	Liquid (KBPD)	
Others SEA									
9	Vietnam 9-2	JOC	Production	25%	PetroVietnam SOCO	50% 25%	14	4	<ul style="list-style-type: none"><li>• Maintain production level</li><li>• Development drilling study support</li></ul>
10	Vietnam 16-1	JOC	Production	28.5%	PetroVietnam SOCO OPECO	41% 28.5% 2%	7	13	<ul style="list-style-type: none"><li>• Maintain production level</li><li>• Drill development wells</li><li>• Subsurface and Project study</li></ul>
11	Vietnam B & 48/95	JV	Exploration	8.5%	PetroVietnam MOECO	65.88% 25.62%			<ul style="list-style-type: none"><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 2024</li></ul>
12	Vietnam 52/97	JV	Exploration	7%	PetroVietnam MOECO	73.4% 19.6%			<ul style="list-style-type: none"><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 2024</li></ul>
13	Natuna Sea A	JV	Production	11.5%	Premier Oil KUFPEC Petronas Pertamina	28.67% 33.33% 15% 11.5%	205	2	<ul style="list-style-type: none"><li>• Drill development wells</li><li>• FEED study: Start Anoa &amp; Gajah Baru compressor project</li></ul>
Middle East									
1	Abu Dhabi Offshore 1	JV	Exploration	30%	Eni Abu Dhabi	70%			<ul style="list-style-type: none"><li>• Perform 3D seismic activities</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	Abu Dhabi Offshore 3	JV	Exploration	30%	Eni Abu Dhabi	70%			<ul style="list-style-type: none"><li>• Perform 3D seismic acquisition</li><li>• G&amp;G studies</li></ul>
4	PDO (Block 6)	JOC	Production	2%	Government of Oman Shell Total	60% 34% 4%		552	<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><li>• Perform Development activities</li><li>• Drill exploration and appraisal wells</li></ul>
5	Mukhaizna	JV	Production	1%	Occidental OOCEP Indian Oil Mubadala Total	45% 20% 17% 15% 2%		82	<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><li>• Drill exploration wells</li><li>• Perform Development activities</li></ul>
6	Block 12	JV	Exploration	20%	Total E&P Oman Block 12 B.V.	80%			<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><li>• Drill an exploration well</li></ul>

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\*\* Sales volume stated at 100% basis

	Project	Status*	Phase	PTTEP's Share	Partners (as Dec 2020)		2020 Average Sales Volume **		2021 Key Activities
							Gas (MMSCFD)	Liquid (KBPD)	
Other International									
1	PTTEP Australasia (PTTEP AA)	OP	Exploration	90%-100% (varied by permits)					<ul style="list-style-type: none"><li>AC/RL7 (Cash Maple) and Orchid Field (AC/P54) : under way to define proper direction in order to increase development opportunities</li><li>Other exploration projects: G&amp;G studies</li><li>AC/L4: total block relinquishment</li></ul>
2	Mozambique Area 1	JV	Development	8.5%	Total, Mitsui, ENH, OVL OVRL & Oil India , Bharat	26.5%,20% 15%, 10% 10%, 10%			<ul style="list-style-type: none"><li>First Cargo is expected by 2024</li><li>Drill development wells</li><li>Continue Onshore and Offshore well construction</li><li>1<sup>st</sup> Debt drawdown in project Finance</li></ul>
3	Algeria 433a & 416b (Bir Seba)	JOC	Production	35%	PetroVietnam Sonatrach	40% 25%	-	17 (net entitlement)	<ul style="list-style-type: none"><li>Drill development wells</li><li>Production respect OPEC policy</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>Subsurface model update</li><li>Further well sites construction</li></ul>
5	Mariana Oil Sands	OP	Exploration	100%					<ul style="list-style-type: none"><li>Conduct well abandonment campaign and reclamation activities</li></ul>
6	Barreirinhas AP1	JV	Exploration	25%	Shell Brasil Mitsui E&P Brasil	65% 10%			<ul style="list-style-type: none"><li>Waiting for exploration wells drilling permit from the government</li></ul>
7	Brazil BM-ES-23	JV	Exploration	20%	Petrobras INPEX	65% 15%			<ul style="list-style-type: none"><li>G&amp;G and Predevelopment studies</li></ul>
8	Mexico block 12 (24)	JV	Exploration	20%	PC Carigali Mexico Ophir Mexico	60% 20%			<ul style="list-style-type: none"><li>G&amp;G study</li><li>Drilling Exploration wells</li></ul>
9	Mexico block 29 (24)	JV	Exploration	16.67%	Repsol Mexico PC Carigali Mexico Wintershal DEA	30% 28.33% 25%			<ul style="list-style-type: none"><li>Drilling Appraisal and Exploration wells</li><li>Appraisal and Exploration concept study</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)



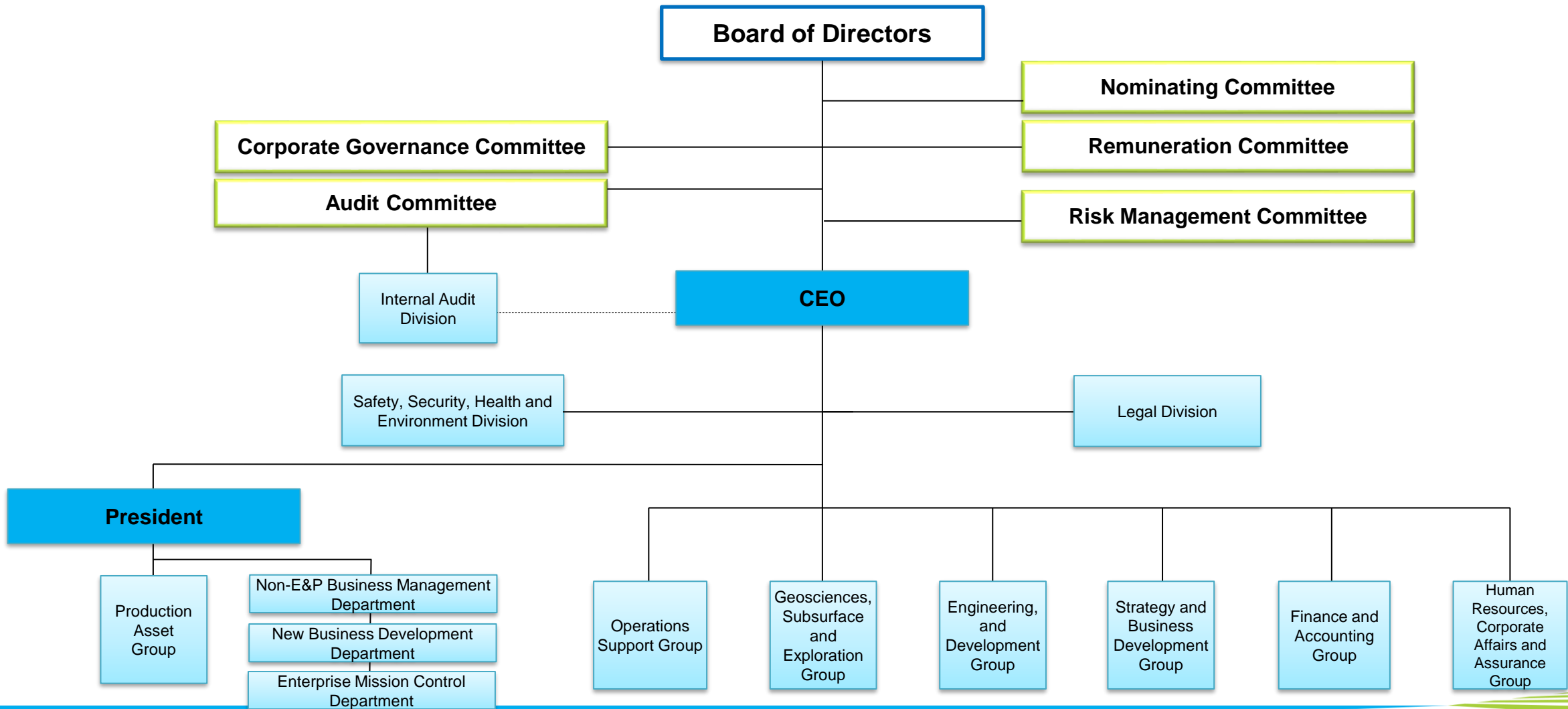
	Project	Status*	Phase	PTTEP's Share	Partners <i>(as Dec 2020)</i>		2020 Average Sales Volume **		2021 Key Activities
							Gas (MMSCFD)	Liquid (KBPD)	
Other International									
10	Block 17/06	JV	Pre development	2.5%	Total Sonangol SSI Acrep Falcon Oil	30% 30% 27.5% 5% 5%			<ul style="list-style-type: none"><li>A part of Partex acquisition which was completed on 4 November 2019</li><li>Maintain production plateau</li><li>FEED and Predevelopment Study</li></ul>
11	Potiguar	OP	Production	50%	Petro reconcavo	50%		0.189	<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 OOCEP	60% 20%	2	12	<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><li>New well tie-ins to gather the system</li><li>Designing of Compression and Separation upgrade</li><li>Designing of Sea water and Export Line</li></ul>
Midstream Project									
1	Oman LNG	Shareholder	On line	2%	Government of Oman Shell Total Korea LNG Mitsubishi Mitsui Itochu	51% 30% 5.54% 5% 2.77% 2.77% 0.92%			<ul style="list-style-type: none"><li>A part of Partex acquisition which was completed on 4 November 2019</li><li>Power Project to maintain operations</li></ul>
2	ADNOC Gas Processing (AGP)	JV	On line	2%	ADNOC Shell Total	68% 15% 15%			<ul style="list-style-type: none"><li>A part of Partex acquisition which was completed on 4 November 2019</li><li>Perform Midstream operation activities such as fire water network and plant flare upgrade</li></ul>

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\*\* Sales volume stated at 100% basis

# Organization structure

Ensuring transparency, integrity and good corporate governance



# Supplementary Index : Ratio & Formula

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	$\text{Trailing-12-month EBITDA} / \text{Trailing-12-month Interest Expenses \& Amortization of Bond Issuing Cost}$