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**Sustainability Indices**

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# Investor Presentation

PTT Group – ESG Day

15 June 2022



# Cautionary Statement



## 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.



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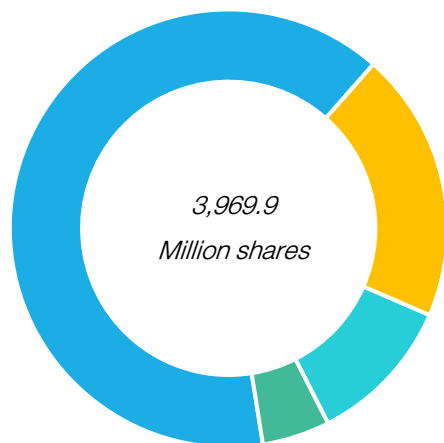
# Company Introduction



# PTTEP Overview | E&P Flagship of PTT Group



## Shareholding Structure



PTT Group 64%

Local  
Institutions 20%

Foreign  
Institutions 11%

Retails 5%

As of latest book closing Aug 2021

Stock Quote  
Market Capitalization  
Sales Revenue  
Cash Cost

PTTEP  
> 15 Billion USD  
> 90% SEA & ME  
< 14 USD/BOE

## Operating Framework



2014-2021



2016-2021



2016-2021



Level "A"



Level "B"

## Strategy

### HPO & Thrive in Lower Carbon Future

Sustainable E&P business

- ☐ Maintain Competitive Unit Cost
- ☐ Expand gas-weighted portfolio in Focused Countries
- ☐ Production CAGR 5% by 2030

Diversification beyond E&P

- ☐ NI 20% by 2030
- ☐ ARV, Power, CCU

EP Net Zero 2050

- ☐ Greenhouse Gas Management through Avoid, Mitigate and Offset
- ☐ CCS

### Sustain Business Integrity Excellence

GRC role model

### Create Shared Values

Circular Model for E&P

Ocean for Life "Guardian of the Ocean"



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# Business Update



# Key Focus Areas 2022

A large offshore oil rig is illuminated at night, with its complex structure of pipes, platforms, and cranes glowing against a dark blue sky and sea. The rig is supported by several large legs in the water.

## G1/61 & G2/61

Safe transition & accelerate ramp-up activities

## Assets Monetization

SK410B (Lang Lebah)  
FEED for FID in 2023

## Exploration

21 exploration and appraisal wells in 4 countries

## GHG & CCS

Emission intensity reduction and CCS rollout

## Net Zero

To achieve Net Zero GHG Emissions by 2050

## Diversification

ARV, G2P, CCU, Renewables, H2 study

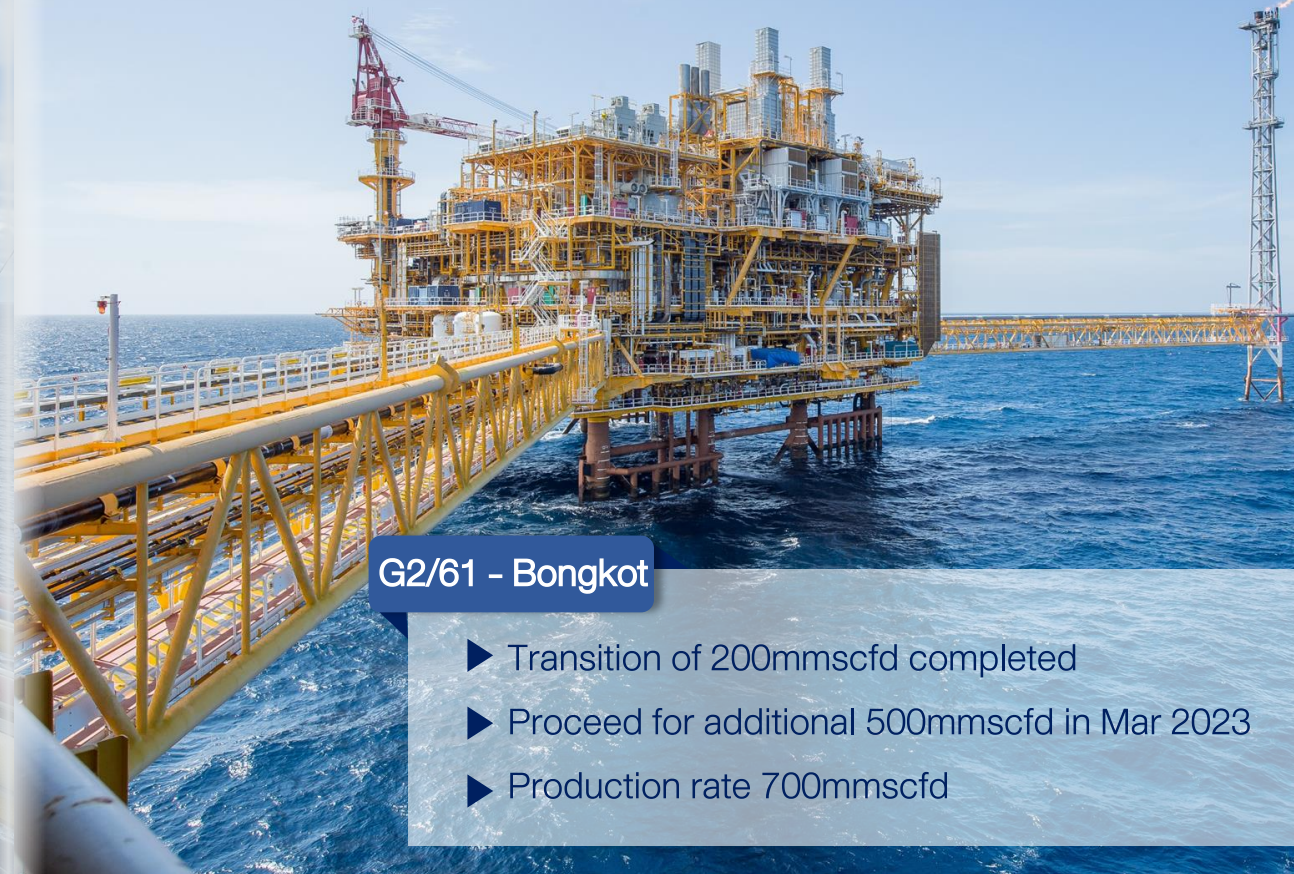
# Transition of G1/61 and G2/61

**Note:** ARAA : Asset Retirement Access Agreement  
ATA : Asset Transfer Agreement  
OTA : Operations Transfer Agreement  
PSC : Production Sharing Contract  
SAA : Site Access Agreement



G1/61 - Erawan

- ▶ Operatorship transfer completed
- ▶ Initial production rate 200-250 mmscfd
- ▶ Sole Investment 100%



G2/61 - Bongkot

- ▶ Transition of 200mmscfd completed
- ▶ Proceed for additional 500mmscfd in Mar 2023
- ▶ Production rate 700mmscfd



# Business Update | E&P



## Thailand

### G1/61

Transition and Operatorship transfer completed 24 APR 2022. Proceed to ramp-up activities to achieve 800MMSCFD in 24 months

### G2/61

Transition of 200MMSCFD completed  
On track for additional 500 MMSCFD in Mar 2023  
Total production rate 700MMSCFD



## Malaysia

### SB412

Obtained new block SB412 from MY Bid Round 2021. PSC signed in March 2022.

### SK410B

Prepare to drill 1 more exploration well in 2022  
For SK410B (Lang Lebah) - FID expected in 2023



## Myanmar

### Yadana

Appointed as new operator effective 20 July 2022  
Operatorship transfer under preparation  
Stake increases to 37%



## UAE

### Sharjah Onshore Area C

25% stake acquisition completed 1 March 2022  
Proceed to do seismic activity



## Mozambique

### MZB LNG

1<sup>st</sup> Cargo expected in 2025 awaiting local security situation



## Algeria

### HBR-Phase I

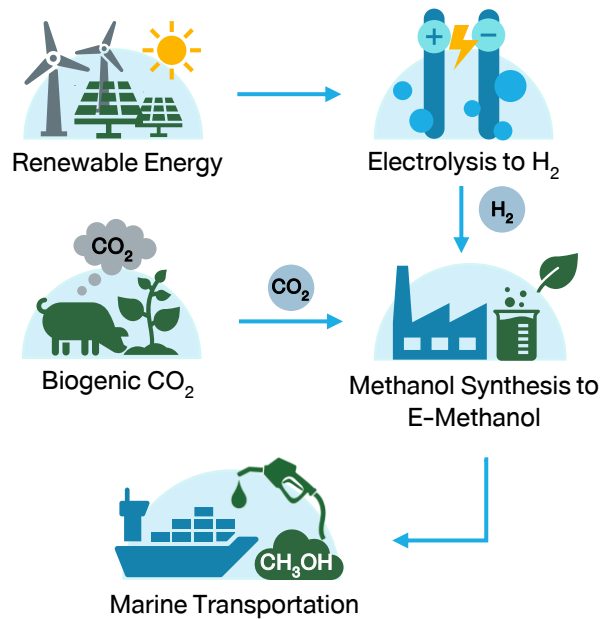
1<sup>st</sup> Oil on 1 June 2022 contributing  
4 KBOED this year



## Green Methanol

24 Jan 2022 : Signed a MOU with multiple international firms to explore Green Methanol value chain, with plan of 50KTPA methanol production plant in Singapore

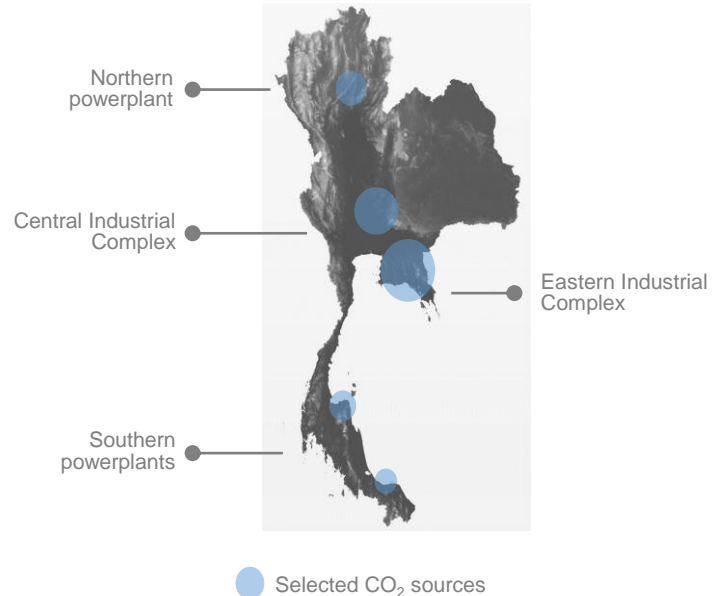
### What is Green Methanol?



## CCS

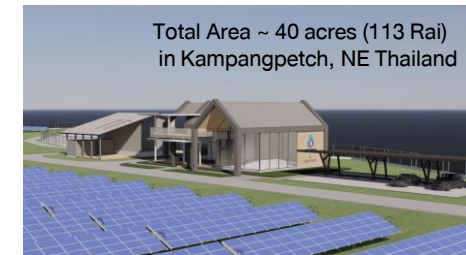
12 January 2022 : Established Thailand CCS Project Task Force to develop CCS initiatives

25 April 2022 : Signed a MOU with INPEX and JGC to explore on CCS project in Thailand



## Solar Farm

- 1<sup>st</sup> Pilot Solar energy project of PTTEP
- ~10 MWp, FID mid 2022 and COD early 2023
- 100% owned by FST, 100% offtake by S1
- Completed FEED and started application of permits and licenses



## ARV

- 21 April 2022 : Establishment of B-Med X, a JV between Cariva, a subsidiary of ARV, and BJC Healthcare, subsidiary of BJC
- To develop an aesthetic marketplace application and expand to healthcare business such as remote healthcare system





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# ESG Update



# Our Net Zero Ambition

**2020**

Base Year

**2030**

**30%**

GHG Intensity\*  
Reduction

**2040**

**50%**

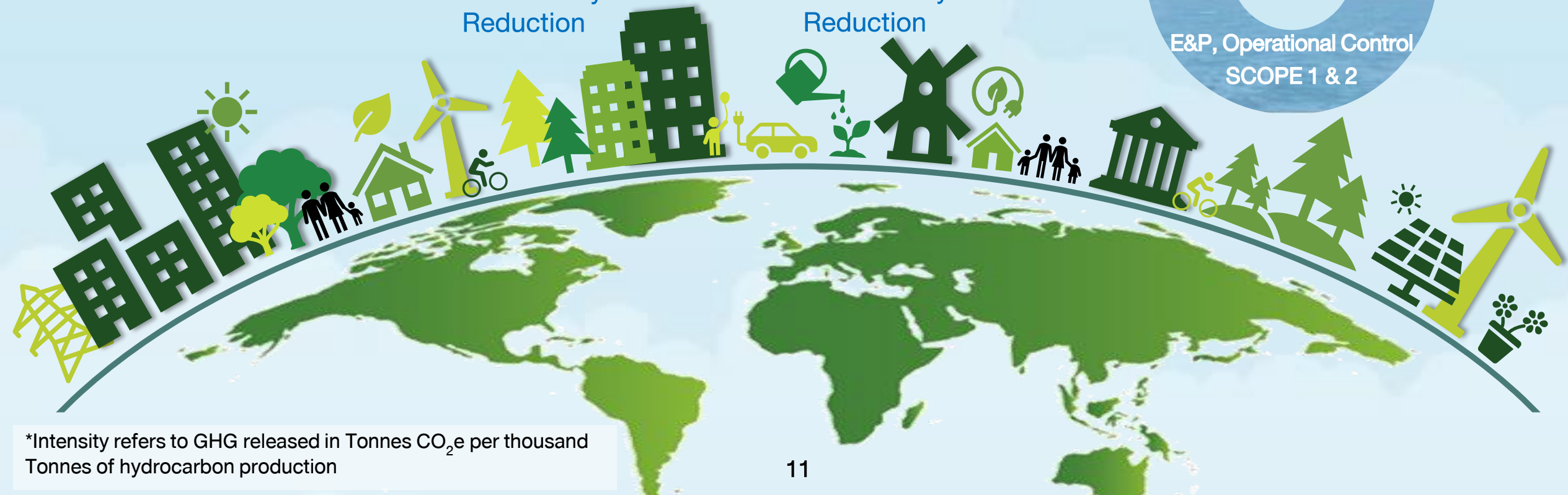
GHG Intensity  
Reduction

**2050**

**NET ZERO**

Greenhouse Gas Emissions

E&P, Operational Control  
SCOPE 1 & 2

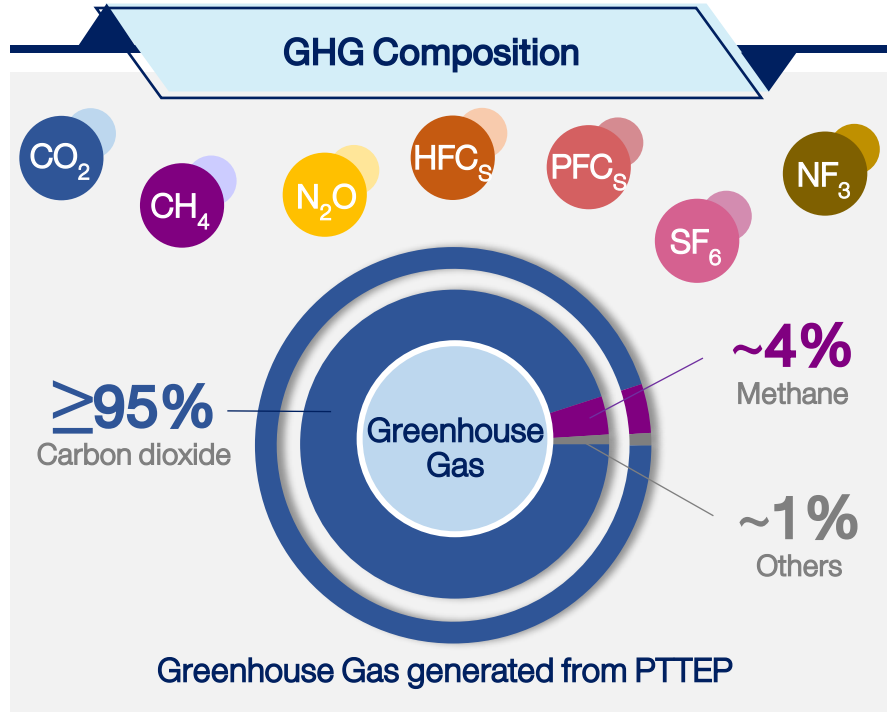


\*Intensity refers to GHG released in Tonnes CO<sub>2</sub>e per thousand Tonnes of hydrocarbon production

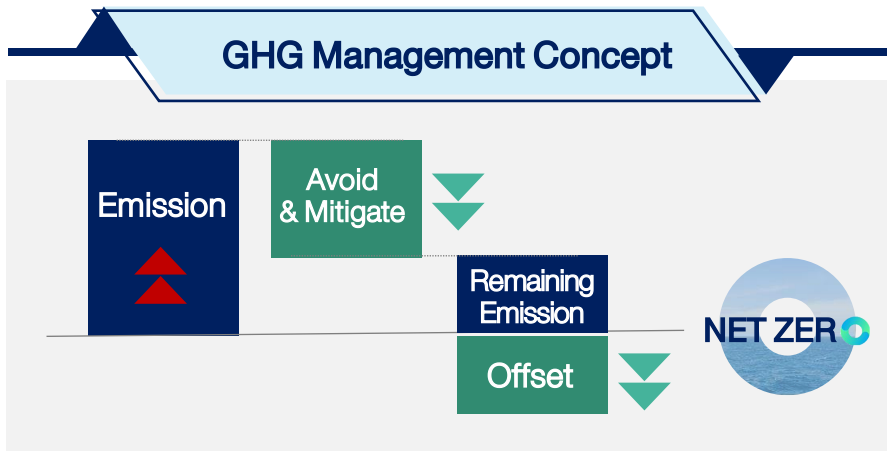


# Pathway to Net Zero GHG Emissions

## GHG Composition



## GHG Management Concept



## Net Zero Roadmap

Exploring for Lower Carbon E&P Portfolio



Production and Planet in Balance

### Roadmap & Key Milestones

2021

2030

2040

**2050**  
**NET ZERO**

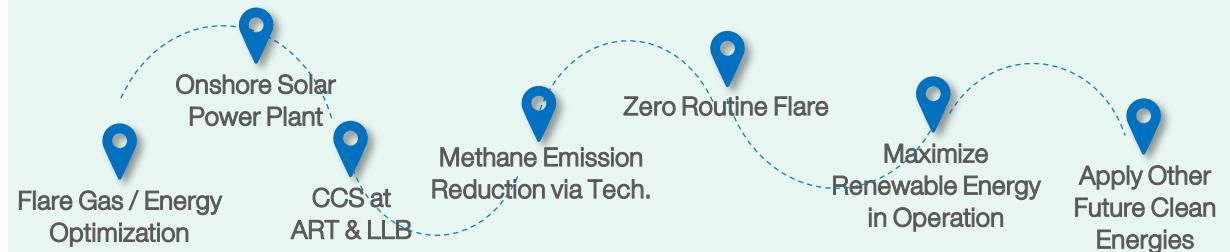
Greenhouse Gas Emissions  
E&P, Operational Control  
SCOPE 1 & 2

Avoid

Internal Carbon Price

Lower Carbon E&P Portfolio Management

Mitigate



Offset

Forestation Program and Blue Carbon Project  
Other Offset Program through Ocean for Life

# SD & ESG | Disclosure and Ratings



ESG Standards

GRI

Global Reporting Initiative Reporting Standards (GRI Standards)

Oil and Gas Sector Disclosures (OGSD)

ESG Ratings	<div><div><div>👍</div><div>S&amp;P Global Ratings</div><div>ESG Rating</div></div><div><div>100</div><div>80</div><div>60</div><div>40</div><div>20</div></div><div><div></div><div></div><div></div><div></div></div></div>
	<div><div><div>MSCI</div><div>ESG Rating</div></div><div><div>AAA</div><div>AA</div><div>A</div><div>BBB</div><div>BB</div><div>B</div><div>CCC</div></div><div><div></div><div></div><div></div><div></div></div></div>
	<div><div><div>Moody's</div><div>ESG Credit Impact</div></div><div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div></div><div><div></div><div></div></div></div>
	<div><div><div>CDP</div><div>DISCLOSURE INSIGHT ACTION</div><div>Climate Change</div></div><div><div>A</div><div>A-</div><div>B</div><div>B-</div><div>C</div><div>C-</div><div>D</div><div>D-</div><div>No Response</div></div><div><div></div><div></div></div></div>
	<div><div><div>SUSTAINALYTICS</div><div>a Morningstar company</div><div>ESG Risk Rating</div></div><div><div>0-10</div><div>10-20</div><div>20-30</div><div>30-40</div><div>40+</div></div><div><div></div><div></div><div></div></div></div>

Source: S&P Global, MSCI, Moody's, CDP, SUSTAINALYTICS' websites

# SD & ESG | Progress Q1/2022



## GHG Management

GHG Intensity Reduction Target  
**25%** By 2030 (2012 base year)

**Net Zero** By 2050

### ◆ PROGRESS ◆

#### Reduction of GHG Emission Intensity

As of Q1/2022, **26.1% Reduction** (2012 base year)  
(2.47 MMTCO<sub>2</sub>e)

**Flare Gas Recovery**  
Recover excess gas to  
production process

**Fugitive & Vent**  
Leak monitoring  
and preventing

**Energy Efficiency**  
Operation efficiency and  
energy saving

**Smart Logistics**  
Logistics operation  
efficiency improvement

**Carbon Capture Storage**  
Trap from flare and inject it  
into suitable storage site

### CCUS

- Thailand CCS Project Task Force and CCS Steering Committee Establishment – Jan 2022
- CCUS Projects :
  - CCS – Ongoing CCS Pre-FEED at ART and LLB
  - CCU – Ongoing Prototype Testing Unit of CO<sub>2</sub> to Carbonate-Based Product
  - Ongoing FEED Study for CNT Pilot Unit at S1



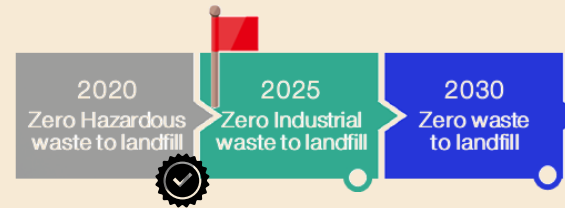
## Circular Model

**Zero** Waste to Landfill by 2030

**≥50%** of Main Structure Reuse by 2030

### ◆ PROGRESS ◆

#### Waste to Landfill

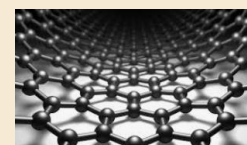


#### Upcycling High Volume Waste

**Sand to Zeolite:** Successfully synthesized prototype zeolite from nano-silica and further identify potential use case (moisture absorbent)



**Oil sludge conversion to Graphene:** Complete prototype unit fabrication



## Ocean for Life

### Net Positive Impact

of Biodiversity & Ecosystem Services in Offshore Operations vs baseline by 2030

**≥50%** Increase in Local community income vs baseline by 2030

### ◆ PROGRESS ◆

#### Ocean Health & Biodiversity Monitoring

Pilot Project of Seagrass Plantation at Koh Samui and Koh Taen, Surat Thani



MOU signed with HII on Ocean Data Platform

#### Ramp Up CSR around Ocean Flagship Projects



- 3 New Area Selection for Aquatic Animal Hatchery Learning Centers (Chonburi, Sumut Prakarn, Samut Sakorn)
- 4,000 Rais Mangrove Forestation Area Selection (Chumphon, Surat Thani and Nakhon Si Thammarat)
- Conservation Areas & 7.8 km<sup>2</sup> Fish Home Areas



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# Thank you and Q&A



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## Supplementary information

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# Finance | Q1/22 Highlights

## Q1'22 Highlights (QoQ)



**Average Selling price +10%**

- Liquid +20%
- Gas +4%



**Average Sales volume +2% (6KBOED)**  
mainly from increased DCQ of Arthit project from 220 mmscfd to 280mmscfd



**Outstanding Oil Price Hedging volume**

Q1'22 : 11.55 mmbbl  
Q4'21 : 15.4 mmbbl

## Q4'21 Extra gains



**Other income from Malaysia Block K redetermination**

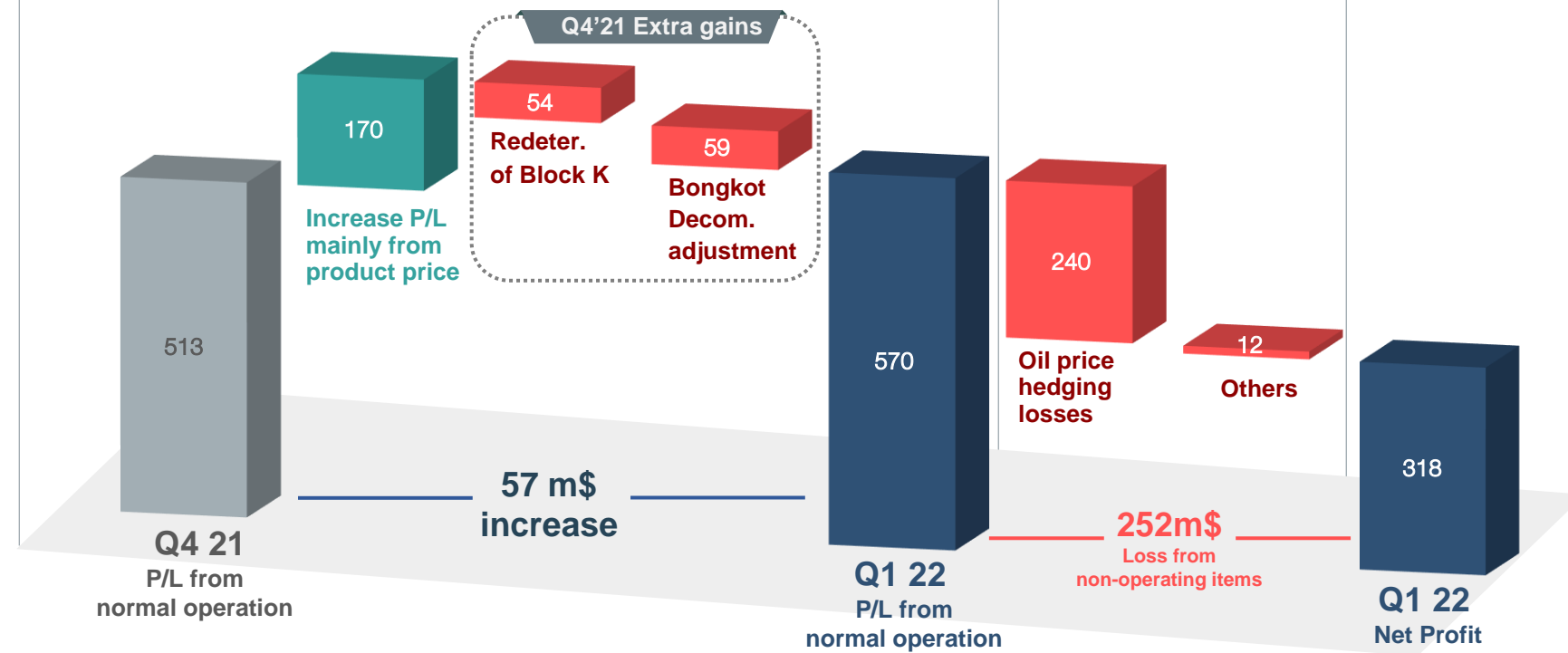


**Reduction in DDA from Bongkot Decommissioning Liabilities adjustment**

## Profit (Loss) from normal operation Q1'22 vs Q4'21

## Non-operating items in Q1'22

Unit : million USD

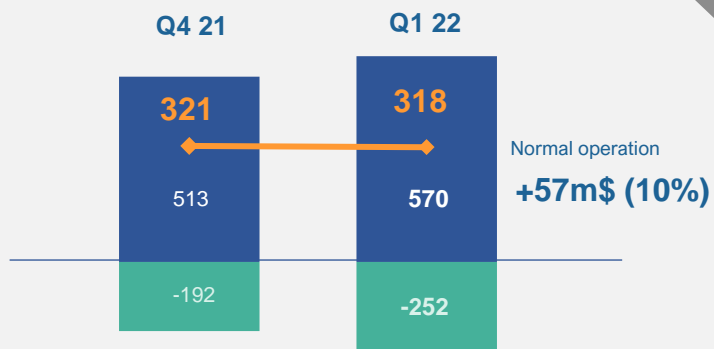





# Results | Net Profit and Key Drivers

## Net Profit

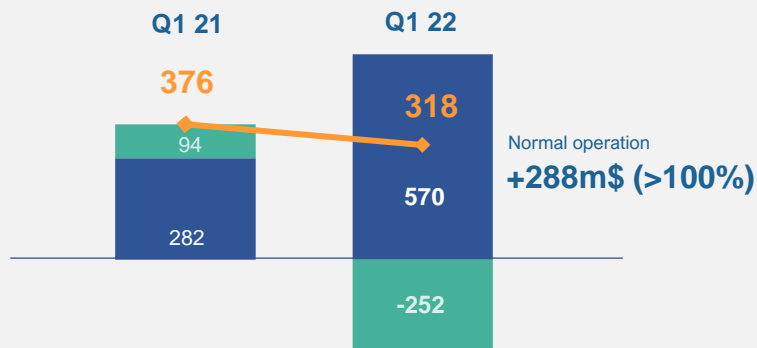
(in million USD)

### QoQ



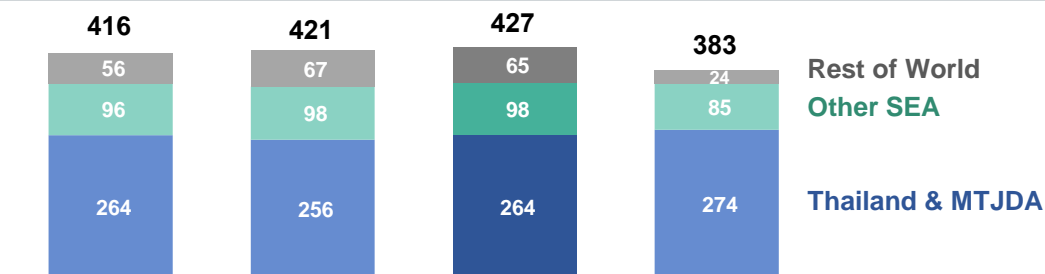
 **Net Profit**  
 P/L from normal operation  
 P/L from non-operating items (e.g. oil price hedging, impairments etc.)

### YoY



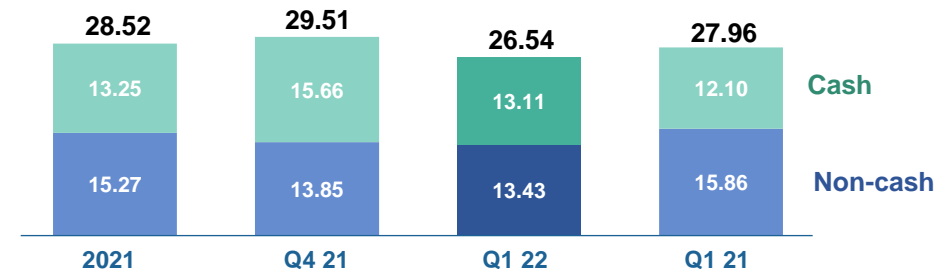
## Sales Volume<sup>(1)</sup> (+2% QoQ, +12% YoY)

(in KBOED)



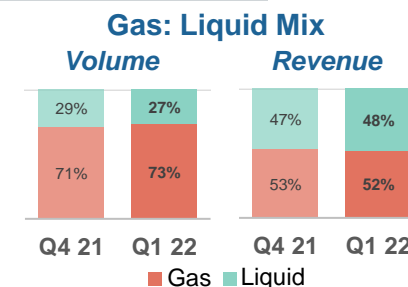
## Unit Cost<sup>(2)</sup> (-10% QoQ, -5% YoY)

(in USD/BOE)



## Average Selling Price (+10% QoQ, +27% YoY)

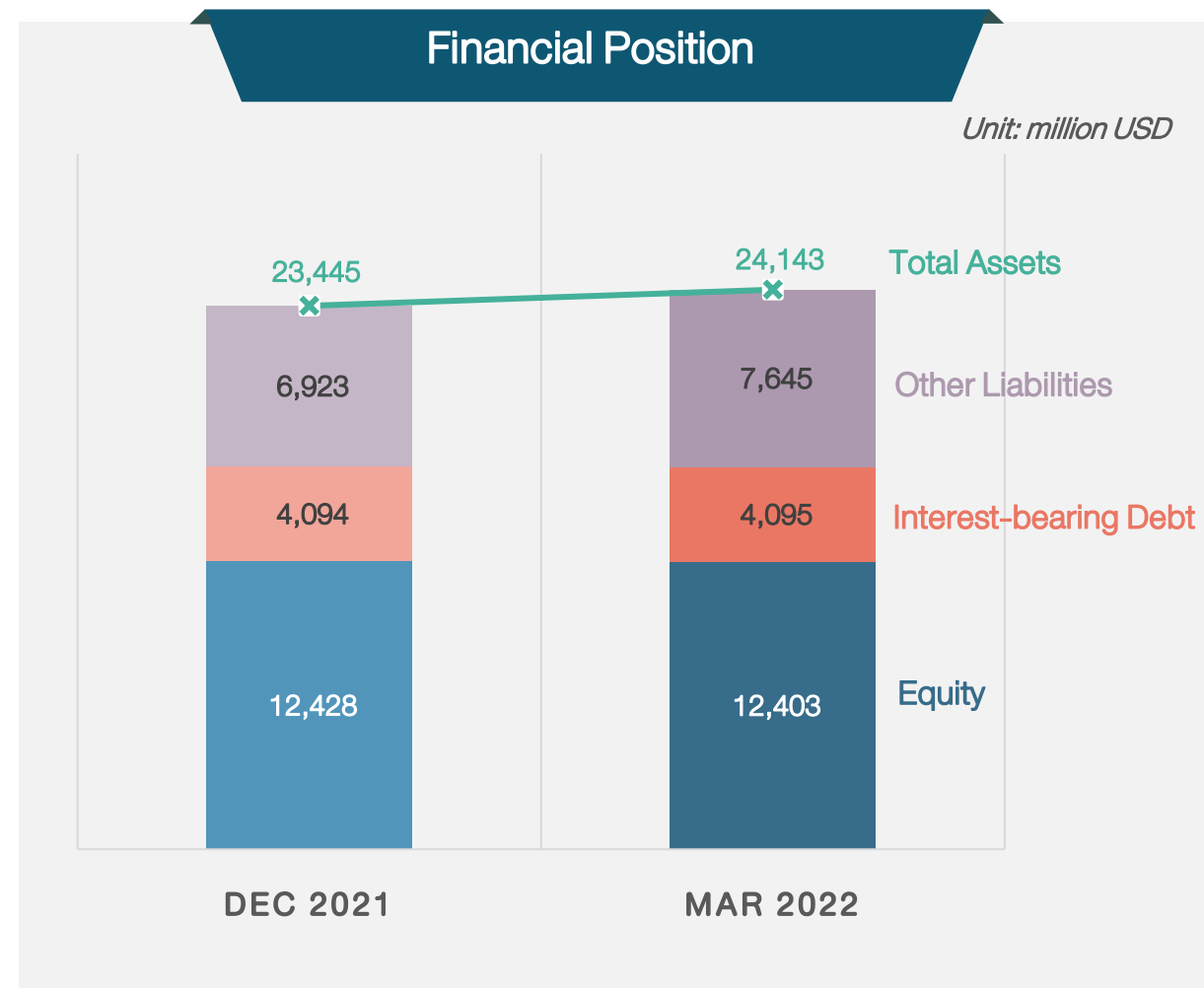
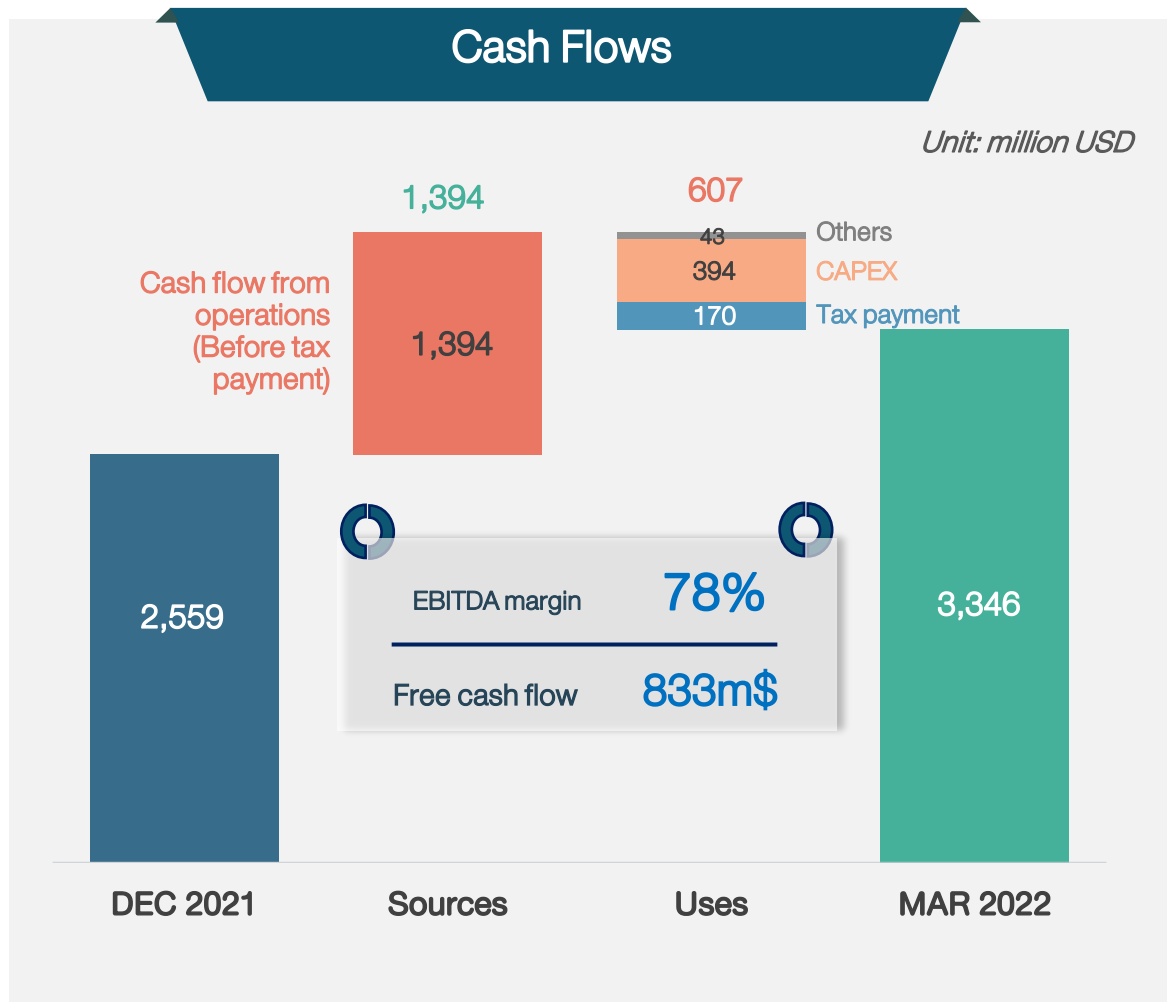
	2021	Q4 21	Q1 22	Q1 21
Gas (\$/MMBTU)	5.69	5.81	6.07	5.61
Liquid (\$/BBL)	66.70	76.17	91.19	56.59
<b>Avg. Selling Price (\$/BOE)</b>	<b>43.49</b>	<b>46.87</b>	<b>51.35</b>	<b>40.38</b>
Avg. Dubai (\$/BBL)	69.39	78.27	96.21	60.01
Avg. HSFO (\$/BBL)	64.42	71.38	87.96	56.74



**Note:** <sup>(1)</sup> Include sales volume from ADNOC Gas Processing (AGP)  
 Exclude Oman Block 61 deemed sales volume from tax payment by government

<sup>(2)</sup> Exclude Exploration assets write-off in Brazil for Q1 21  
 All Unit Cost shown above exclude costs related to new business

# Results | Cash Flows and Financial Position



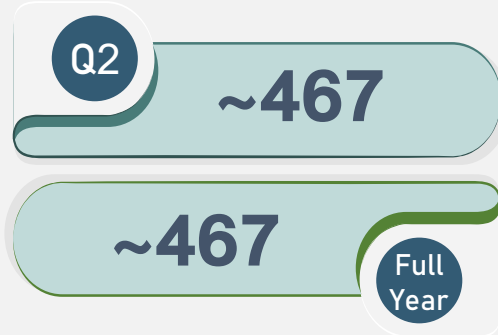
Note: \* Include Short-term investment  
Net of adjustment for the effect of exchange rate changes on cash and cash equivalents

# Results | Financial Guidance and Debt Profile

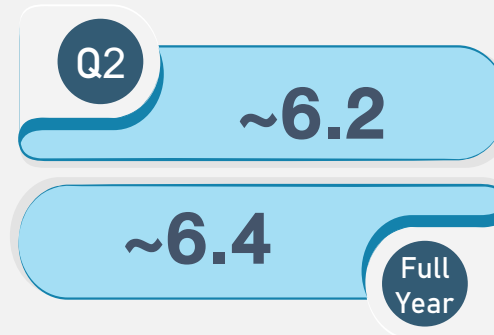


## Financial Guidance

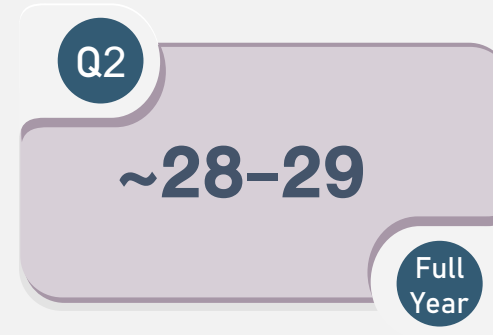
Average Sales Volume  
KBOED



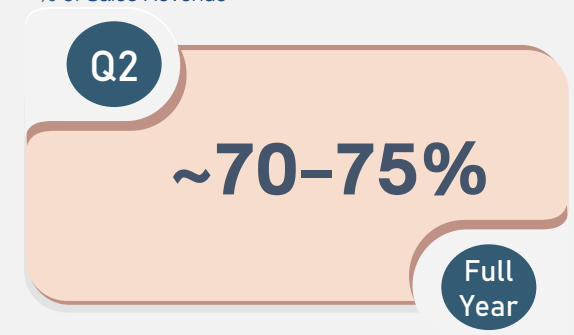
Average Gas Price\*  
USD/MMBTU



Unit Cost  
USD/BOE



EBITDA Margin  
% of Sales Revenue



\* Based on average Dubai oil price in 2022 at 96 \$/BBL, with sole investment in G1/61 (Erawan)

## Debt Profile

	2021	Q1 2022
Debt to Equity	0.33	0.33
Debt to EBITDA	0.80	0.72
Average Cost of Debt	3.38%	3.38%
Average Loan Life	12.7 Yrs	12.4 Yrs
Interest Rate (Fixed : Float)	83:17	83:17

Note: Debt excludes Hybrid bonds

## Credit Ratings



# Finance | Profit and Loss Statement



Unit: million USD

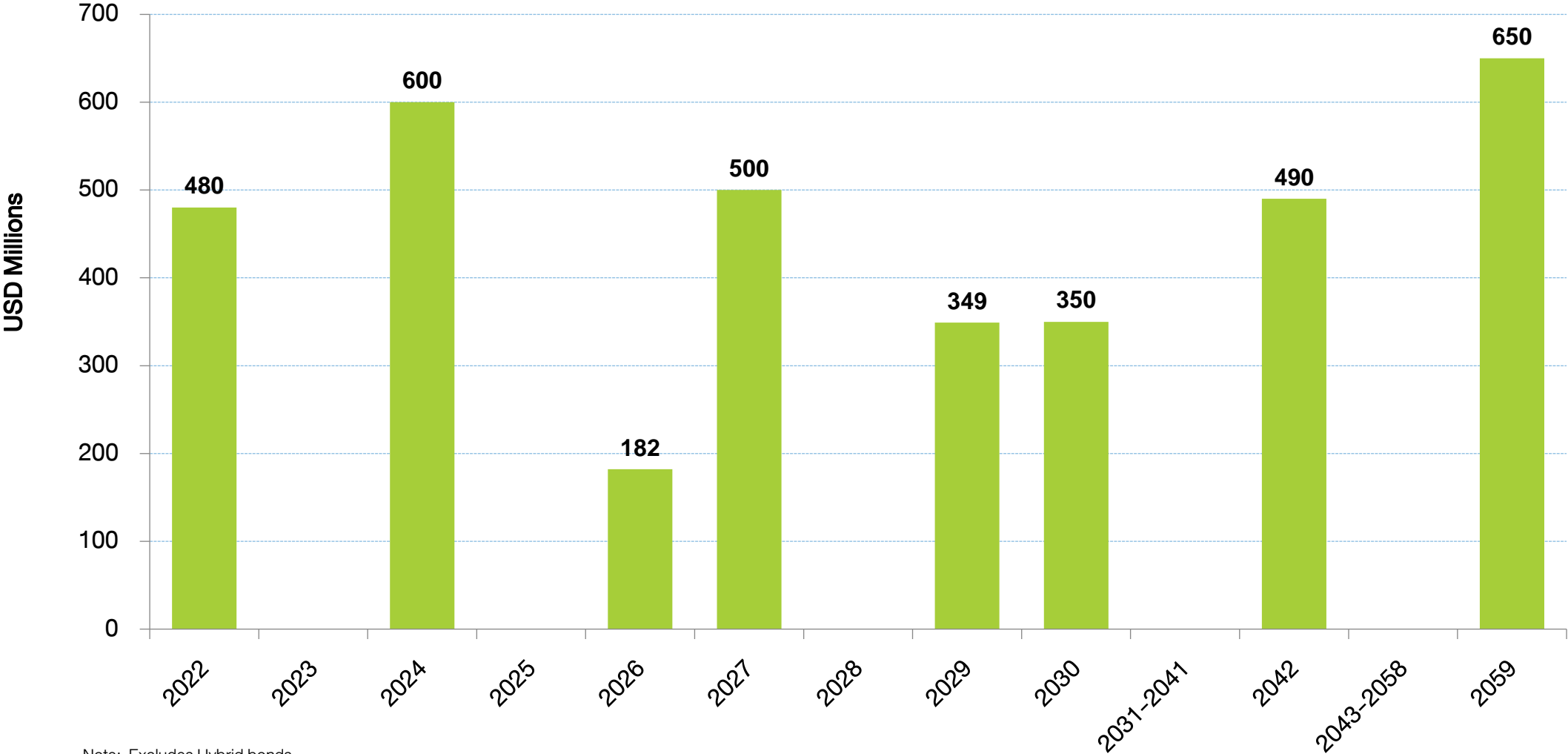
	Q1 22	Q4 21	%QoQ	Q1 21	%YoY	FY2021
<b>Total Revenues</b>	<b>2,083</b>	<b>1,989</b>	<b>5%</b>	<b>1,779</b>	<b>17%</b>	<b>7,314</b>
Sales <sup>(1)</sup>	2,030	1,867	9%	1,391	46%	6,731
Sales Volume (BOED) <sup>(2)</sup>	427,368	420,965	2%	382,877	12%	416,141
Sales Price (US\$/BOE)	51.35	46.87	10%	40.38	27%	43.49
Gain from a bargain purchase	-	-	-	350	(100%)	342
Others <sup>(3)</sup>	53	122	(57%)	38	39%	241
<b>Total Expenses</b>	<b>1,776</b>	<b>1,671</b>	<b>6%</b>	<b>1,405</b>	<b>26%</b>	<b>6,118</b>
<b>Major Expenses:</b>						
Operating Expenses	197	275	(28%)	174	13%	861
Exploration Expenses	6	20	(70%)	149	(96%)	226
G&A	93	125	(26%)	75	24%	355
DD&A	517	420	23%	547	(5%)	2,202
Loss on Financial Instruments	245	7	>100%	98	>100%	234
Impairment Loss on Assets	-	183	(100%)	-	-	183
Income Tax Expenses	497	448	11%	192	>100%	1,287
<b>Share of profit (loss) from associates and JV</b>	<b>11</b>	<b>3</b>	<b>&gt;100%</b>	<b>2</b>	<b>&gt;100%</b>	<b>15</b>
<b>Net Profit</b>	<b>318</b>	<b>321</b>	<b>(1%)</b>	<b>376</b>	<b>(15%)</b>	<b>1,211</b>
Profit (Loss) from normal operation	570	513	11%	282	>100%	1,479
Profit (Loss) from non-operating items	(252)	(192)	(31%)	94	(>100%)	(268)
<b>Non-operating items breakdown:</b>						
Oil Price Hedging	(240)	5	(>100%)	(107)	(>100%)	(284)
Tax from Effect of FX	(2)	1	(>100%)	(9)	78%	(10)
Effect from FX and others	(10)	(15)	33%	5	(>100%)	12
Impairment Loss on Assets	-	(183)	100%	-	-	(183)
Exploration assets write-off	-	-	-	(145)	100%	(145)
Gain from a bargain purchase	-	-	-	350	(100%)	342

## Note:

(1) Include Oman Block 61 deemed sales revenues from tax payment by government

(2) Exclude Oman Block 61 deemed sales volume from tax payment by government

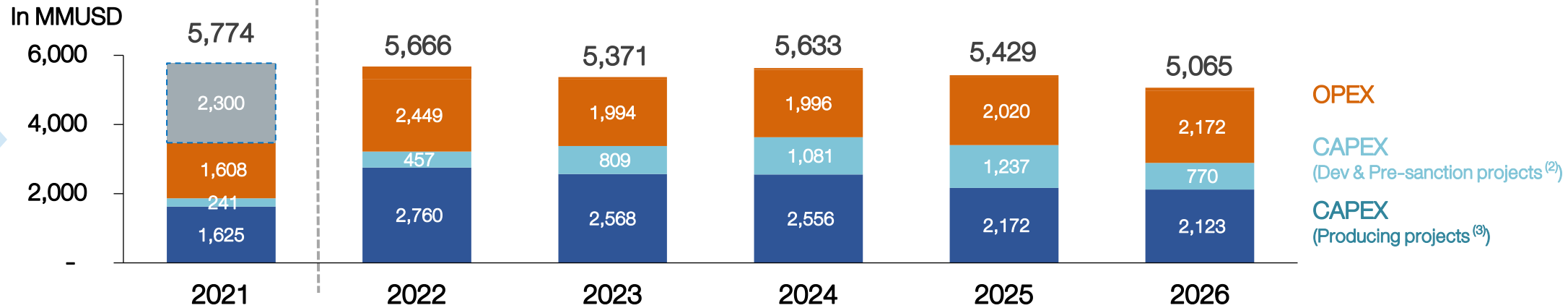
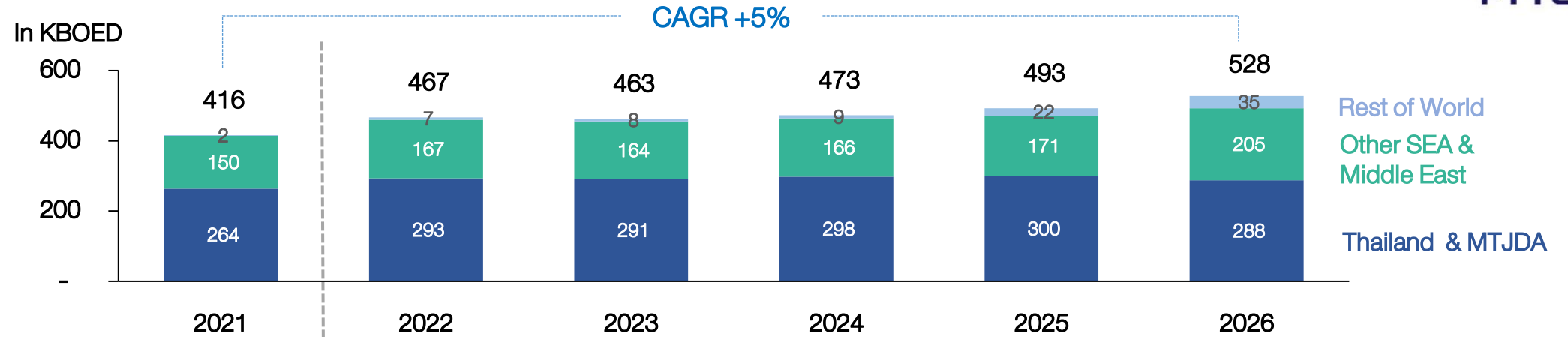
(3) Consisted of Revenue from Pipeline, Gain from FX, Forward Contract, and Gain from Oil price Hedging, and Malaysia Block K redetermination of participating interest in Q4'21



Note: Excludes Hybrid bonds  
Unit: USD Millions or equivalent after cross currency swap

# Finance | 5-year Investment Plan

Not included Sole Investment in G1/61 (Erawan)

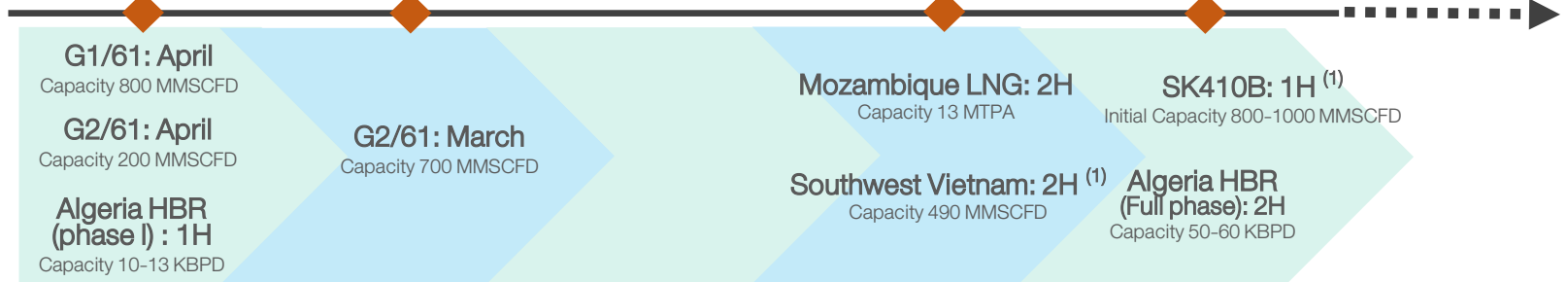


5 Years (2022 – 2026)

CAPEX	16,533
OPEX	10,631
<b>TOTAL</b>	<b>27,164</b>



Key Project Start-up

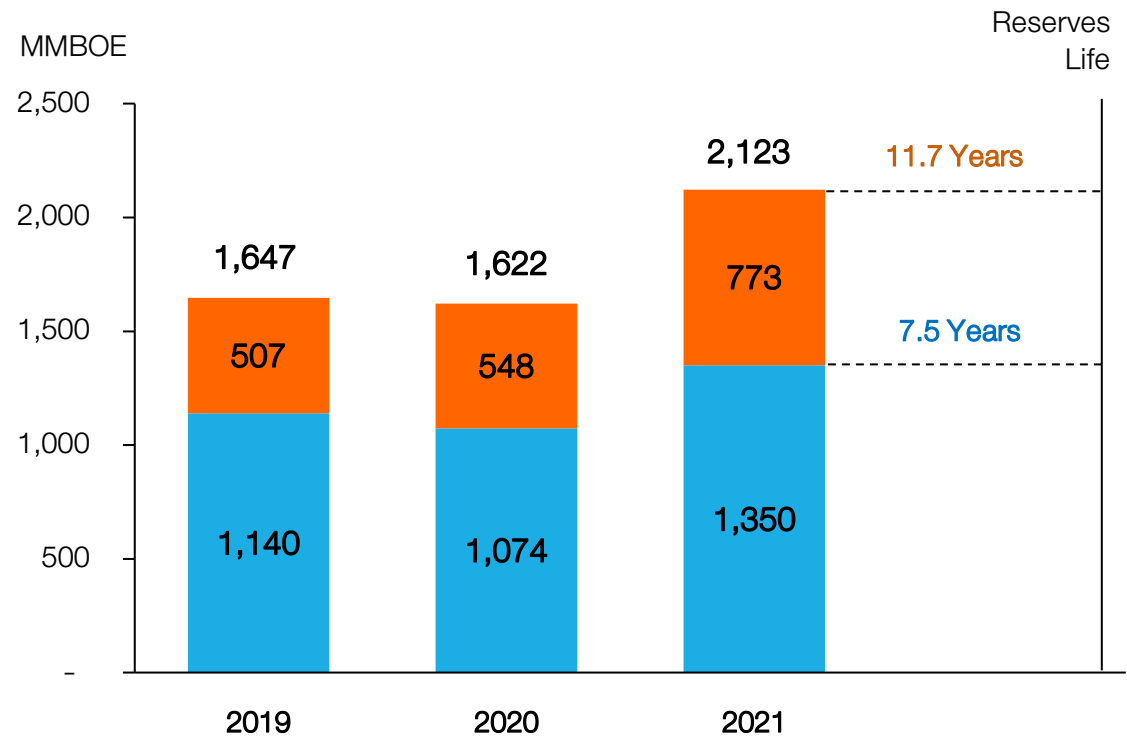


Note: <sup>(1)</sup> Subject to regulatory approval and FID timing

<sup>(2)</sup> Development & Pre-sanction projects include Mozambique LNG , Algeria HBR, SK410B and Southwest Vietnam

<sup>(3)</sup> Including exploration and appraisal in all projects and head office CAPEX, and new businesses

# Petroleum Reserves



■ Proved (P1) ■ Probable (P2)

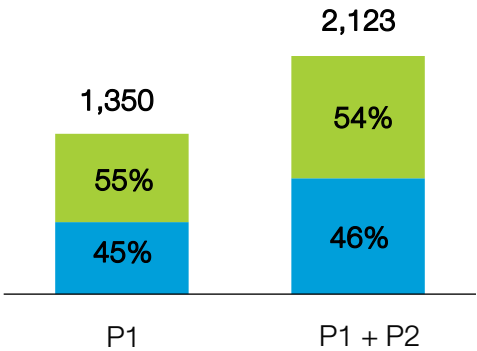
5-Year Average Proved Reserves Replacement Ratio (RRR)

2019	2020	2021
1.5X	1.5X	1.9X

- Based on total production of natural gas, condensate, and crude oil (including LPG) of 495 KBOED for the year ended December 31, 2021
- Figures include reserves from equity method

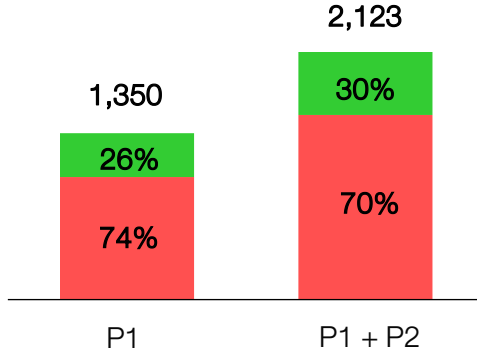
2021 by Geography

■ Domestic ■ International



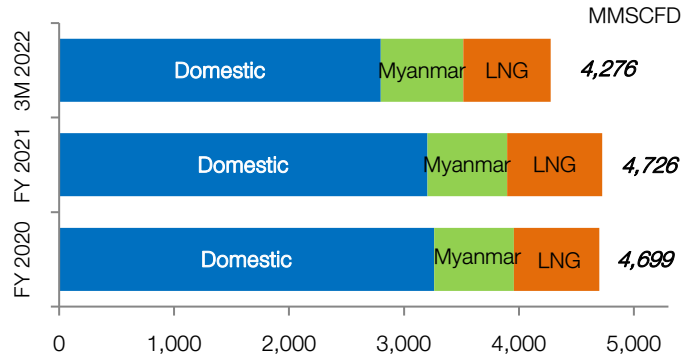
2021 by Product Type

■ Gas ■ Liquid



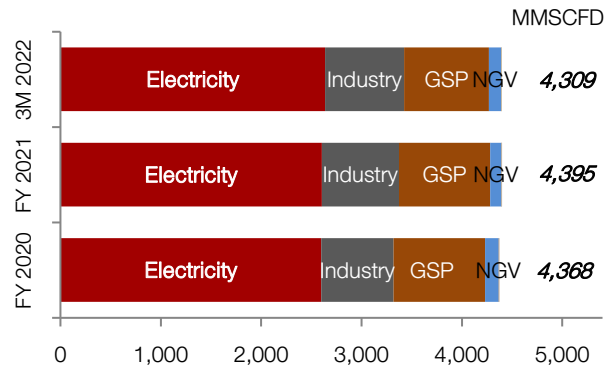
## Thailand Energy Overview

### Natural Gas Supply

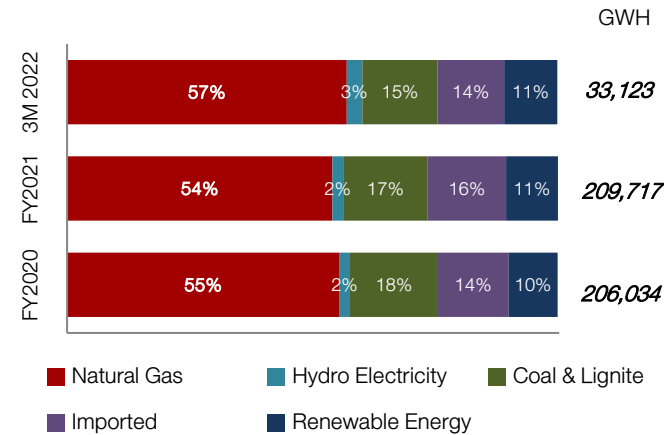


- Stable energy demand, while the energy prices continue to soar
- As of March 2022, compared with the same period of last year: significantly declined in domestic supply, while gas from Myanmar and LNG imports remained constant.

### Natural Gas Consumption

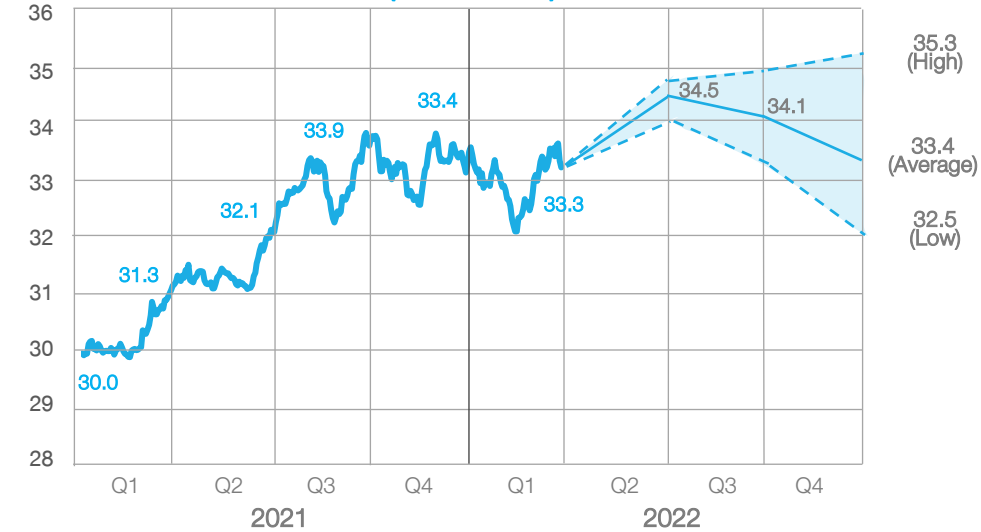


### Electricity Generation



Source: Energy Policy and Planning Office (EPPO)

## Exchange Rate Movement (USD/THB)



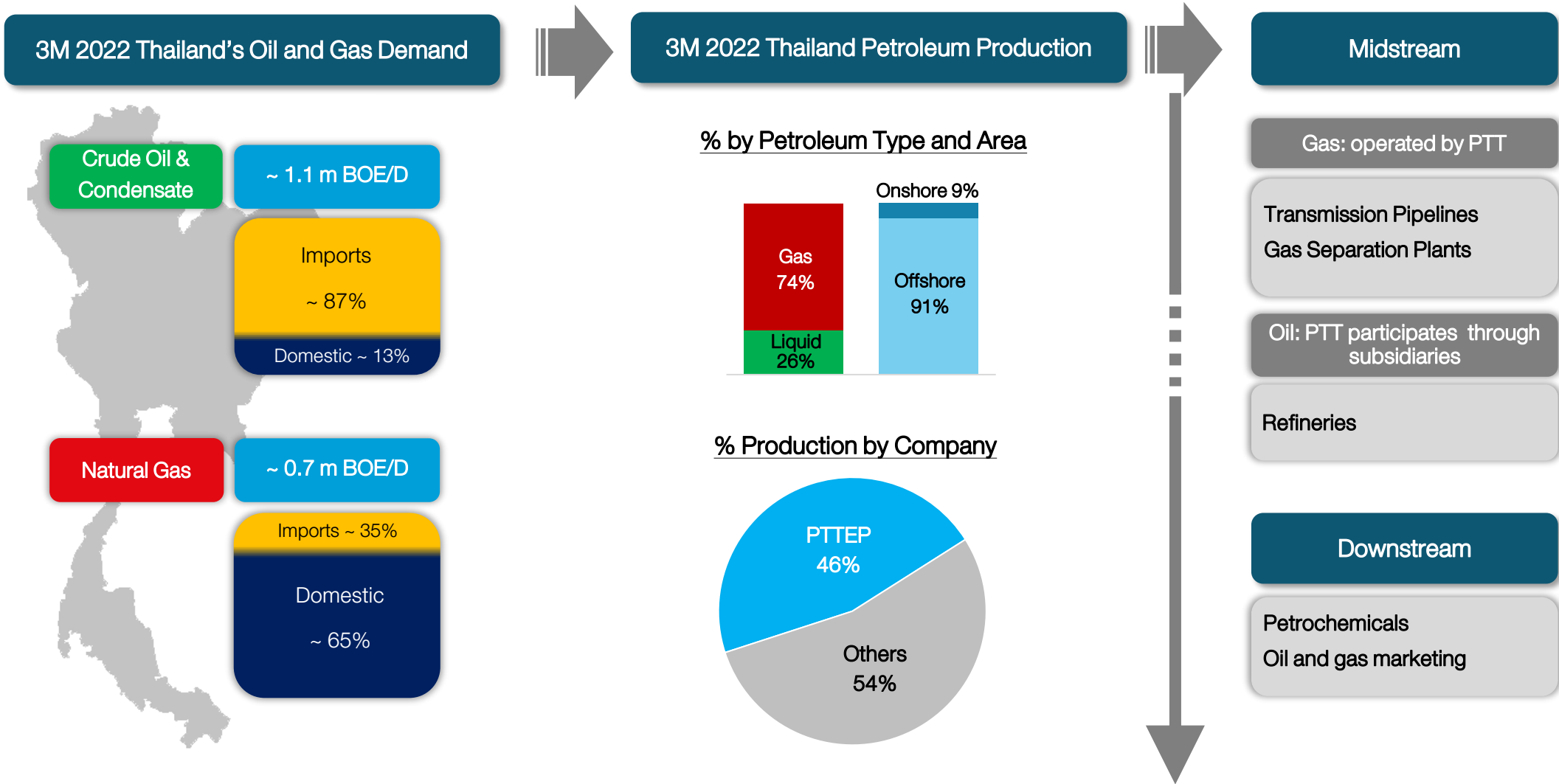
### Consensus on the exchange rate mostly depends on

- Thailand economic recovery in particular the tourism sector
- Bank of Thailand and Federal Reserve monetary policy tightening schedule
- Geopolitical tensions and uncertainty from the Russia-Ukraine war

Source: Bank of Thailand, Bloomberg

Forecast based on Bloomberg Consensus as of 31 March 2022

# Thailand | Energy Value Chain

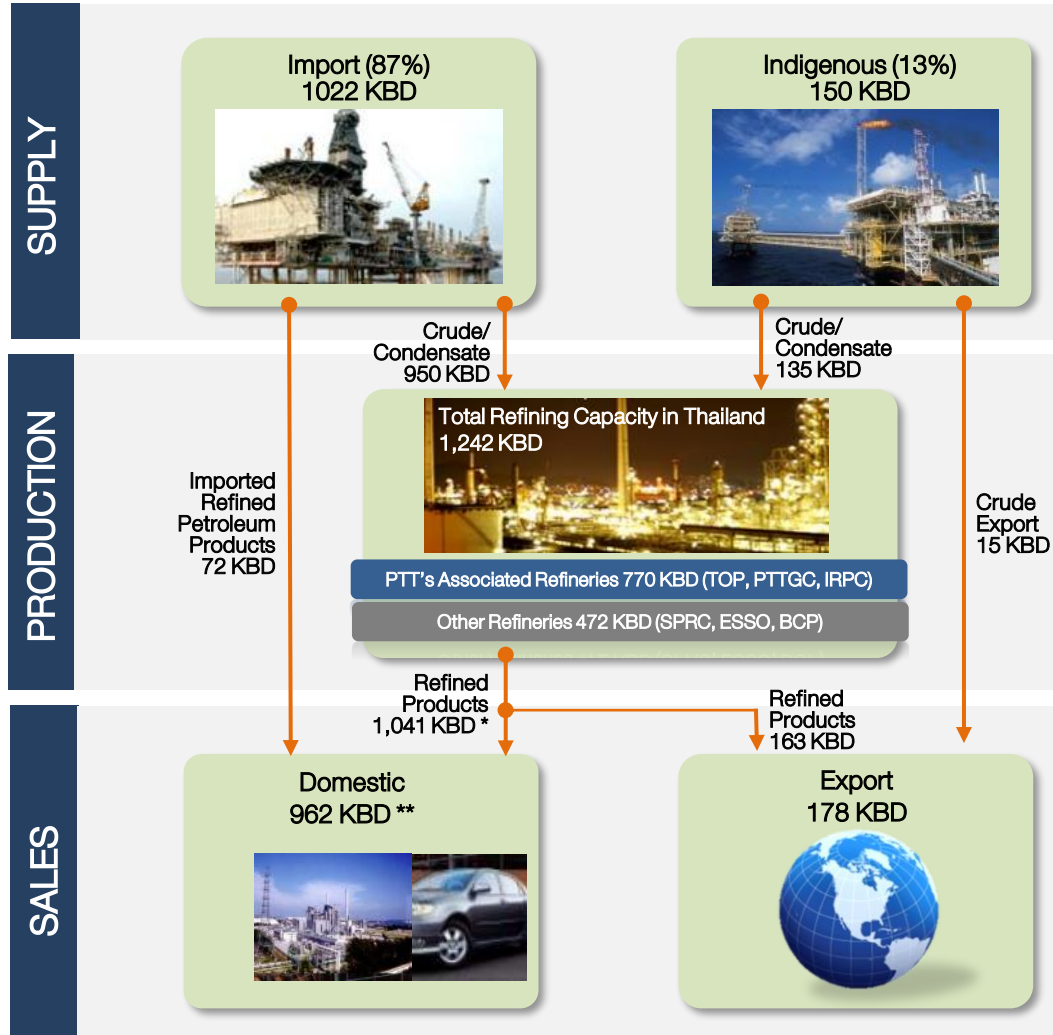


Source: Energy Policy and Planning Office (EPPO) and Department of Mineral Fuels (DMF)

# Thailand | Oil and Gas Balance

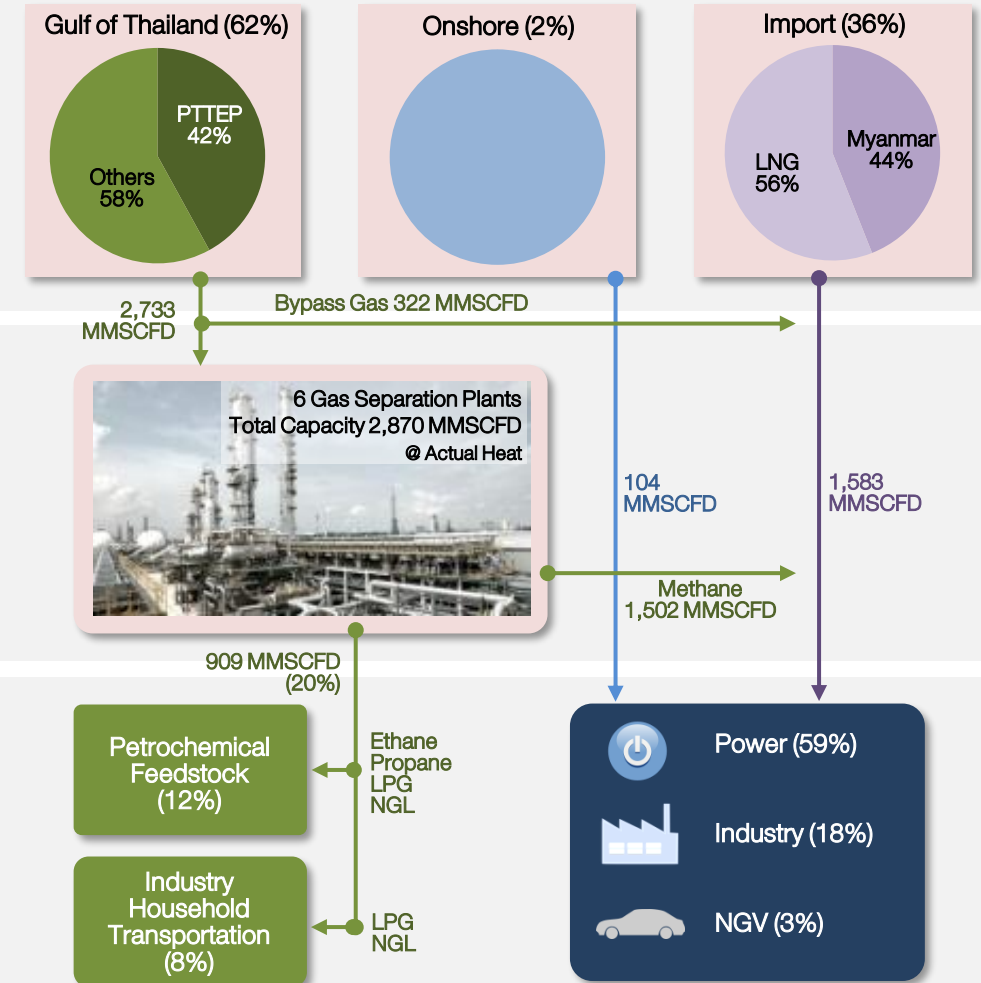
## Oil Balance\*\*\*

Maintains stability supply through adequate refining capacity



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

Main driver of the Thailand economy



Source: PTT

Note: \* Refined product from refineries = 958 KBD, including domestic supply of LPG from GSPs and Petrochemical Plants = 83 KBD

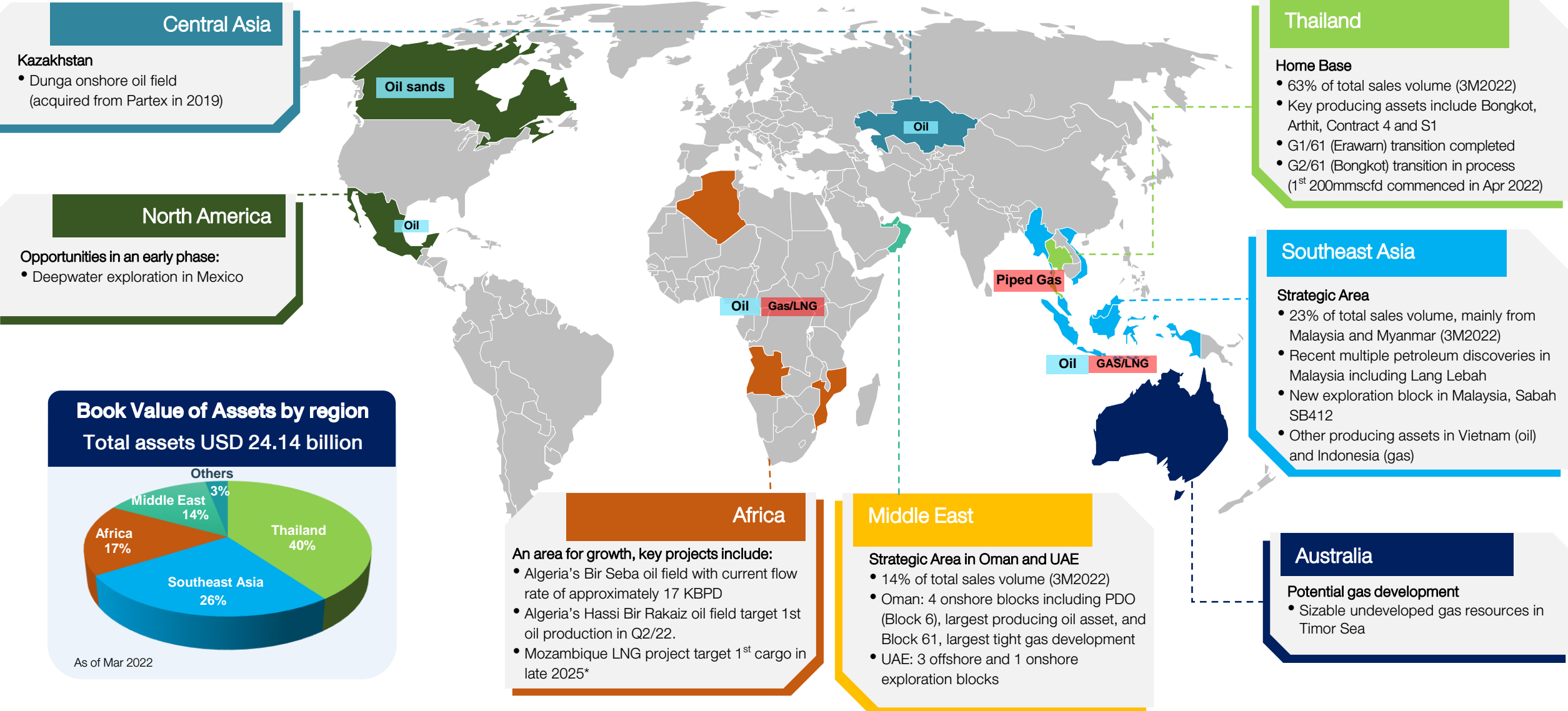
\*\* Not included Inventory

\*\*\* Information as of 2M 2022

\*\*\*\* Information as of Year 2021

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

# Projects | Diversified portfolio



Note: As of March 2022

\* Subject to local security situation

# Projects | Thailand, Myanmar and Malaysia

## Myanmar

### Production

Three producing offshore gas fields supplying gas to both Thailand and Myanmar: Zawtika, Yadana and Yetagun

One field under development plan – M3 (100% WI)

**Zawtika** (80% WI) – PTTEP is operator

**Yadana** (25.5% WI) – PTTEP to be operator and stake will increase to 37.1% in July 2022

**Yetagun** (19.3% WI) – Approaching the end of field. Submitted notice to withdraw.

## Thailand

### Production / Ramp-up Projects

**Bongkot** (66.6667% WI)

Average natural gas and condensate sales volume of 819 MMSCFD and 22 KBPD in 3M2022

**S1** (100% WI)

The largest onshore crude oil production field in Thailand with 3M2022 average crude oil sales volume of 25 KBPD

**Arthit** (80% WI)

Average sales volume in 3M2022 was 277 MMSCFD of natural gas and 15 KBPD of condensates

**Contract 4** (60% WI)

Average sales rate of 403 MMSCFD for natural gas and 16 KBPD for condensate in 3M2022

**G1/61** (60% WI)

Operatorship transfer completed. Current production rate of 250-300MMSCFD. Sole investment 100%

**G2/61** (100% WI)

GBS transition completed at production rate of 200 MMSCFD



● Production phase  
● Exploration phase

## Malaysia

### Production

#### Block K Project

Kikeh (56% WI), Siakap North-Petai (SNP) (22.4% WI) and Gumusut-Kakap (GK) (7.2% WI)

- Average production volume in 3M2022 was 32\* KBPD of crude oil and 27\* MMSCFD of natural gas

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

For East Patricia field (42% WI)

- Average production volume in 3M2022 was 193\* 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 with average production volume in 3M2022 at 275 MMSCFD of natural gas
- Full capacity at 270 MMSCFD

*For Block K, gross production is net off utilization*

### Exploration

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

- Multi TCF gas discovery in Lang Lebah Field
- Expected to reach Final Investment Decision (FID) in 2023

#### Sarawak SK417 and Sarawak SK405B projects

- New Petroleum discoveries with additional well drilling to assess upside potential

#### Sabah SB412

- New block awarded from 2021 Malaysia Bid Round
- The project is under preparation for Exploration activities

*Note: WI – working interest*

# Projects | Vietnam and Indonesia



- Production projects
- Pre sanction projects

## Vietnam



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

- Average sales volume of crude oil was 13 KBPD in 3M2022
- In 2022, the project has plan to drill 2 development wells in Q3 - Q4/2022.



### 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, with production capacity approximately 490 MMSCFD

## Indonesia

### Natuna Sea A (11.5% WI)

- Average sales volume of natural gas was 199 MMSCFD in 3M2022



## UAE

### Abu Dhabi Offshore 1,2 and 3

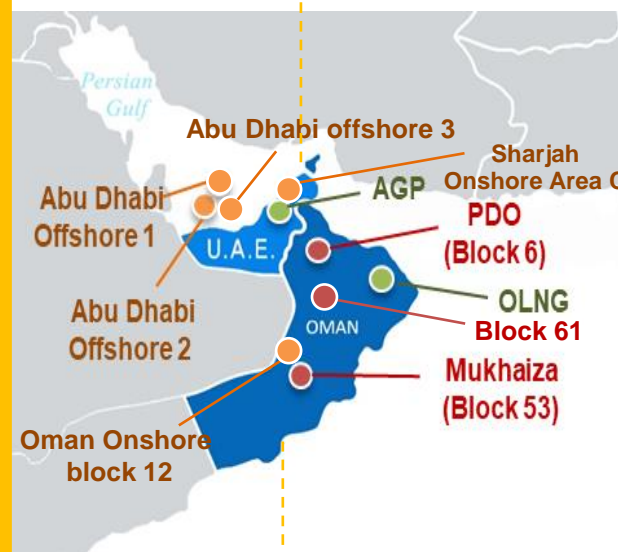
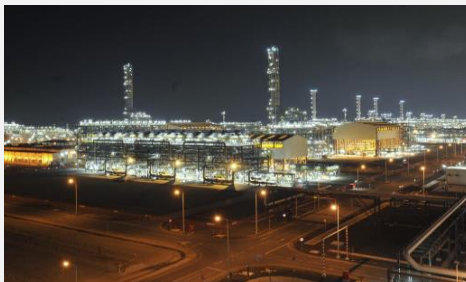
- High potential prospective resources with significant sizeable discoveries
- Located North-west of Abu Dhabi Emirates, United Arab Emirates
- Granted the award for exploration in January 2019 - 2020
- Operated by Eni Abu Dhabi B.V. (70% interest)

### Sharjah Onshore Area C

- High gas & condensate potential with the possibility of integrating with surrounding fields
- Located in the central part of Sharjah Emirate, United Arab Emirates
- Operated by Eni Abu Dhabi B.V. (50% 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)



\*Block awarded in 2019  
\*\*Block awarded in 2020

- Production phase
- Exploration phase
- Midstream

## Oman

### PDO (Block 6)

- Largest asset covering around 1/3 of the country
- Long-life asset, produced only 15% of reserves in-place
- Average oil production volume of 660 KBPD for 3M2022
- Operated by Petroleum Development of Oman (Joint Operating Company)

### Oman Onshore 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)

### Mukhaiza (Block 53)

- Largest single onshore producing field in Oman
- Average oil production volume of 94 KBPD for 3M2022
- Operated by Occidental Petroleum (47% interest)

### Oman Block 61

- Largest tight gas development in Middle East
- Gas and condensate production capacity of 1,500 MMSCFD and 69,000 BPD respectively
- Operated by BP Exploration (Epsilon) Limited (40% 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)

# Projects | Rest of the World

## Algeria

### Bir Sebah

- Block 433a & 416b
- PVEP 40% (operator), PTTEP 35%

### Hassi Bir Rekaiz

- Blocks 443a, 424a, 414ext & 415ext for Crude Oil.
- Sonatrach 51% (operator), PTTEP 49%

## Mozambique

### Mozambique Area 1

- High quality reservoirs capable up to 200mmscfd per well
- LNG capacity 13.1 MTPA (2 trains)
- TotalEnergies 26.5% (operator), PTTEP 8.5%
- Construction phase

## Brazil

### Barreirinhas AP1

- 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

## Mexico

### Mexico block 12 (2.4)

- Non-operating partner with 20% participating interest
- Located in the Mexican Ridges, western Gulf of Mexico
- Currently evaluating the petroleum potential for further way forward

### Mexico block 29 (2.4)

- Non-operating partner with 16.67% participating interest
- Located in the Campeche, southern Gulf of Mexico
- 2 successful deep-water oil discoveries in May 2020
- Currently undergoing a pre-development study



# Projects Details | Thailand



	Project Name	Status	Phase	Participating Interest* (%)		Sales Vol Gas (MMSCFD)	Sales Vol Liquid (KBPD)	Latest Status
1	Arthit	Operator	Production	PTTEP Chevron MOECO	80% 20% 4%	277	15	<ul style="list-style-type: none"> <li>Increase Sales Gas DCQ from 220 to 280 MMSCFD in Feb'22</li> </ul>
2	B6/27	Operator	Production	PTTEP	100%	-	-	<ul style="list-style-type: none"> <li>Prepare for decommissioning activities</li> </ul>
3	B8/32 and 9A	JV	Production	PTTEP Chevron MOECO KrisEnergy Palang Sophon	25.01% 51.66% 16.71% 4.63% 2%	50	11	<ul style="list-style-type: none"> <li>Ensure gas deliverability level at DCQ</li> <li>Drill development wells</li> <li>Preparation for wellhead platform reuse in 2022-23</li> </ul>
4	Bongkot	Operator	Production	PTTEP TotalEnergies	66.67% 33.33%	819	22	<ul style="list-style-type: none"> <li>Infills drilling for BKT Sole investment</li> <li>Maintain production level as planned</li> <li>Carry out wells plug and abandonment, Pipeline cleaning and Hg decontamination</li> <li>Wellhead platform &amp; sealine and FSO1 PLEM Decommissioning (Non-transferred asset)</li> </ul>
5	CT3 (formerly Unocal III)	JV	Production	PTTEP Chevron MOECO	5% 71.25%	206	13	<ul style="list-style-type: none"> <li>Decommissioning activities</li> </ul>
6	CT4 (formerly Pailin)	JV	Production	PTTEP Chevron MOECO	60% 35% 5%	403	16	<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	PTTEP EXXON MOBIL	20% 80%	8	-	<ul style="list-style-type: none"> <li>Ensure gas deliverability level at DCQ</li> </ul>

Note: \* PTTEP denotes respective PTTEP subsidiaries participating in the project

\*\* Sales volume represent **average volume for 100% of the project during Q1/2022**

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

\*\*\*\* DCQ = Daily Contractual Quantity

# Projects Details | Thailand



	Project Name	Status	Phase	Participating Interest* (%)		Sales Vol Gas (MMSCFD)	Sales Vol Liquid (KBPD)	Latest Status
8	G4/43	JV	Production	PTTEP	21.375%	1	2	<ul style="list-style-type: none"> <li>Deliver production volumes as nominated from the buyer and oil production as planned</li> </ul>
				Chevron	51%			
				MOECO	21.25%			
				Palang Sophon	6.375%			
9	G4/48	JV	Production	PTTEP	5%	1	0.1	<ul style="list-style-type: none"> <li>Decommissioning activities</li> </ul>
				Chevron	71.25%			
				MOECO	23.75%			
10	L53/43 & L54/43	OP	Production	PTTEP	100%	-	0.5	<ul style="list-style-type: none"> <li>On-going 5<sup>th</sup> drilled well</li> <li>Plan to complete 6 wells around mid of Apr'22 and commence 1<sup>st</sup> oil by Jul'22</li> <li>Plan for production facilities debottlenecking and relocation projects to handle additional gross production from new wells.</li> </ul>
11	PTTEP1	OP	Production	PTTEP	100%	-	0.2	<ul style="list-style-type: none"> <li>Maintain production plateau</li> <li>Relocate facilities from PTTEP1 to L54/43 to be minimized CAPEX cost</li> </ul>
12	S1	OP	Production	PTTEP	100%	8	Crude: 25 KBPD LPG: 183 MTon/Day	<ul style="list-style-type: none"> <li>Production optimization and long-term development plan are on-going for business plan and work activities identification according to 10 years strategy</li> </ul>
13	Sinphuhorm	OP	Production	PTTEP	55%	95	0.3	<ul style="list-style-type: none"> <li>Ensure gas deliverability</li> <li>Preparing the drilling campaign for 2 wells during Q2 - Q4 2022</li> </ul>
				Apico	35%			
				EXXON MOBIL	10%			
14	L22/43	OP	Production	PTTEP	100%	-	-	<ul style="list-style-type: none"> <li>On-going execution plan of total 5 drilling wells scheduled in Q4 2022.</li> <li>Plan to prepare for the resume production or exit strategy in future after drilling results confirmed.</li> </ul>

Note: \* PTTEP denotes respective PTTEP subsidiaries participating in the project

\*\* Sales volume represent **average volume for 100% of the project during Q1/2022**

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

# Projects Details | Thailand



	Project Name	Status	Phase	Participating Interest* (%)		Sales Vol Gas (MMSCFD)	Sales Vol Liquid (KBPD)	Latest Status
15	MTJDA	JOC	Production	PTTEP Petronas Carigali	50% 50%	260	10	<ul style="list-style-type: none"> <li>Facility Readiness for Additional Gas to DP1 (Thailand) for 30-50 MMSCFD</li> </ul>
16	G9/43	OP	Exploration	PTTEP	100%	-	-	<ul style="list-style-type: none"> <li>Activity suspended</li> </ul>
17	G1/61 (Erawan)	OP	Exploration	PTTEP Mubadala	60% 40%	-	-	<ul style="list-style-type: none"> <li>Successful transition to become operator on 24 April 2022. Initial production rate at 376 MMSCFD</li> </ul>
18	G2/61 (Bongkot)	OP	Exploration	PTTEP	100%	-	-	<ul style="list-style-type: none"> <li>Normal operations</li> </ul>

Note: \* PTTEP denotes respective PTTEP subsidiaries participating in the project

\*\* Sales volume represent **average volume for 100% of the project during Q1/2022**

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

# Projects Details | Myanmar, Malaysia, Other SEA



	Project Name	Status	Phase	Participating Interest* (%)		Sales Vol Gas (MMSCFD)	Sales Vol Liquid (KBPD)	Latest Status
1	Block K [Malaysia] - Kikeh - Siakap-North Petai field (SNP) - Gumusut-Kakap field (GK)	OP (Kikeh & SNP) JV (GK)	Production	PTTEP	Kikeh 56% SNP 22.4% GK 7.17%	32 **	27 **	<ul style="list-style-type: none"> <li>SNP Phase 2 development well commenced production. GK Phase 3 development drilling commenced by Unit Operator.</li> </ul>
2	Sarawak SK309 and SK311 [Malaysia]	OP	Production	PTTEP	42 – 59.5%	193 **	20 **	<ul style="list-style-type: none"> <li>Pemanis Gas Development and South Acis Satellite infill oil development drilling completed and commenced production</li> </ul>
3	Block H [Malaysia]	OP	Production	PTTEP	42 – 56%	275 **	-	<ul style="list-style-type: none"> <li>Normal operations</li> </ul>
4	Malaysia – Other projects	OP	Exploration	PTTEP	42.5 – 80% (varied by permits)	-	-	<ul style="list-style-type: none"> <li><u>SK410B</u> : Plan to drill 1 exploration well and expected FID in 2023 for LLB</li> <li><u>SK417, SK405B, SK438</u> : Planning and preparing for the drilling of appraisal and exploration wells in 2022 exploration campaign</li> <li><u>SB412</u> : Preparing for exploration activities</li> </ul>
5	Yadana [Myanmar]	JV	Production	PTTEP TotalEnergies Chevron MOGE	25.5% 31.24% 28.26% 15%	732	-	<ul style="list-style-type: none"> <li>Appointed to be Operator with effective in Jul'22</li> <li>Under process of operatorship transfer</li> </ul>
6	Yetagun [Myanmar]	JV	Production	PTTEP Petronas- Carigali MOGE Nippon Oil	19.3178% 40.91018% 20.4541% 19.3178%	44	-	<ul style="list-style-type: none"> <li>Submitted notice to withdraw, effective May 2022</li> </ul>
7	Zawtika (M9 & a part of M11) [Myanmar]	OP	Production	PTTEP Myanma Oil and Gas Enterprise (MOGE)	80% 20%	326	-	<ul style="list-style-type: none"> <li>Maintain operations. Some activities are delayed due to COVID-19 and political situation.</li> </ul>

Note: \* PTTEP denotes respective PTTEP subsidiaries participating in the project

\*\* Sales volume represent **average volume for 100% of the project during Q1/2022** except Malaysia (Production volume 100%)/ For Block K, gross production is net off unitization

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

# Projects Details | Myanmar, Malaysia, Other SEA



	Project Name	Status	Phase	Participating Interest* (%)		Sales Vol Gas (MMSCFD)	Sales Vol Liquid (KBPD)	Latest Status
8	M3 [Myanmar]	OP	Exploration	PTTEP	100%	-	-	• Waiting for approval of PSC Supplementary
9	MD-7 [Myanmar]	OP	Exploration	PTTEP TotalEnergies	50% 50%	-	-	• Termination process in progress
10	9-2 [Vietnam]	JOC	Production	PTTEP Vietnam Oil and Gas Group Pharos Energy	25% 50% 25%	12	4	• Maintain production level • Procurement for drilling campaign of 1 development well
11	16-1 [Vietnam]	JOC	Production	PTTEP Vietnam Oil and Gas Group Pharos Energy OPECO	28.5% 41% 28.5% 2%	2	13	• Maintain production level • Procurement for drilling campaign of 2 development wells
12	B & 48/95 [Vietnam]	JV	Exploration	PTTEP Vietnam Oil and Gas Group MOECO	8.5% 65.88% 25.62%	-	-	• Monitoring Power Plants progress • Negotiation process on commercial terms in order to push forward the Final Investment Decision (FID) • The first production target at the end of 2025
13	52/97 [Vietnam]	JV	Exploration	PTTEP Vietnam Oil and Gas Group MOECO	7% 73.4% 19.6%	-	-	• Monitoring Power Plants progress • Negotiation process on commercial terms in order to push forward the Final Investment Decision (FID) • The first production target at the end of 2025
14	Natuna Sea A [Indonesia]	JV	Production	PTTEP Premier Oil KUFPEC Petronas Pertamina	11.5% 28.67% 33.33% 15% 11.5%	199	1	• Maintain production level

Note: \* PTTEP denotes respective PTTEP subsidiaries participating in the project

\*\* Sales volume represent **average volume for 100% of the project during Q1/2022**

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

# Projects Details | Middle East



	Project Name	Status	Phase	Participating Interest* (%)		Sales Vol Gas (MMSCFD)	Sales Vol Liquid (KBPD)	Latest Status
1	Abu Dhabi Offshore 1 [UAE]	JV	Exploration	PTTEP	30%	-	-	• Being evaluated for petroleum potential to support future exploration, including G&G report
				Eni Abu Dhabi	70%			
2	Abu Dhabi Offshore 2 [UAE]	JV	Exploration	PTTEP	30%	-	-	• Continued drilling the first exploration well
				Eni Abu Dhabi	70%			
3	Abu Dhabi Offshore 3 [UAE]	JV	Exploration	PTTEP	30%	-	-	• G&G study is on-going
				Eni Abu Dhabi	70%			
4	Sharjah Onshore Area C [UAE]	JV	Exploration	PTTEP	25%	-	-	• Completed the acquisition of 25% interest on 1 March 2022
				Eni Abu Dhabi	50%			• Seismic activity is in progress
				SNOC	25%			
5	PDO Block 6 [Oman]	JOC	Production	PTTEP	2%	-	660 **	• Normal operations
				Government of Oman	60%			
				Shell	34%			
				TotalEnergies	4%			
6	Mukhaizna [Oman]	JV	Production	PTTEP	1%	-	94 **	• Normal operations
				Occidental	47%			
				OOCEP	20%			
				Indian Oil	17%			
				Mubadala	15%			

Note: \* PTTEP denotes respective PTTEP subsidiaries participating in the project  
 \*\* Sales volume represent **average volume for 100% of the project during Q1/2022** except for PDO Block 6 and Mukhaizna (Production volume 100%)  
 \*\*\* Status: OP = PTTEP operatorship / JOC = PTTEP joint operatorship/ JV = PTTEP Joint Venture Partner

# Projects Details | Middle East



	Project Name	Status	Phase	Participating Interest* (%)		Sales Vol Gas (MMSCFD)	Sales Vol Liquid (KBPD)	Latest Status
7	Block 12 [Oman]	JV	Exploration	PTTEP Total E&P Oman Block 12 B.V.	20% 80%	-	-	<ul style="list-style-type: none"> <li>3D seismic reprocessing (original 3D) in progress</li> <li>3D seismic acquisition (new 3D) is in process for tendering</li> </ul>
8	Block 61 [Oman]	JV	Production	PTTEP BP Makarim Gas Development LLC PC Oman Ventures Limited (PETRONAS)	20% 40% 30% 10%	1,471	61	<ul style="list-style-type: none"> <li>Full production capacity of natural gas and condensate in according to the Sales and Purchase Agreement</li> </ul>

Note: \* PTTEP denotes respective PTTEP subsidiaries participating in the project

\*\* Sales volume represent **average volume for 100% of the project during Q1/2022**

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

# Projects Details | Rest of the World



	Project Name	Status	Phase	Participating Interest* (%)		Sales Vol Gas (MMSCFD)	Sales Vol Liquid (KBPD)	Latest Status
1	PTTEP Australasia [Australia]	OP	Exploration	PTTEP	90%-100%	-	-	<ul style="list-style-type: none"> <li>Cash Maple (AC/RL7) and Oliver (AC/RL12) : Defining proper direction in order to increase development opportunities</li> <li>Tenacious and Oliver : Well abandonment in progress</li> <li>Other exploration projects: G&amp;G studies</li> </ul>
2	Mozambique Area 1 [Mozambique]	JV	Development	PTTEP TotalEnergies, Mitsui, ENH, OVL OVL & Oil India , Bharat	8.5% 26.5%,20% 15%, 10% 10%, 10%	-	-	<ul style="list-style-type: none"> <li>First Cargo is expected by 2025, subject to local security situation</li> <li>1<sup>st</sup> Debt drawdown in project Finance</li> <li>Force Majeure was declared by the operator for safety reason due to the security incident in Palma.</li> <li>Plan to resume construction activities after security and safety restored</li> </ul>
3	Bir Seba 433a & 416b [Algeria]	JOC	Production	PTTEP PetroVietnam Sonatrach	35% 40% 25%	-	17 **	<ul style="list-style-type: none"> <li>Drilling of 2 development wells are on-going in Q1 2022</li> <li>Target to tie-in and produce 2 new wells in 2022</li> <li>Existing wells intervention</li> <li>Production respect OPEC+ policy</li> </ul>
4	Hassi Bir Rekaiz [Algeria]	OP	Development	PTTEP Sonatrach	49% 51%	-	-	<ul style="list-style-type: none"> <li>Continue drilling development wells</li> <li>Expected 1<sup>st</sup> oil production for the initial phase of around 10,000-13,000 BPD in Q2 2022</li> <li>Groupement (JOC) establishment in Q2 2022</li> </ul>
5	Mariana Oil Sands [Canada]	OP	Exploration	PTTEP	100%	-	-	<ul style="list-style-type: none"> <li>The Project is underway for reclamation activities according to government's conditions</li> </ul>
6	Barreirinhas AP1 [Brazil]	JV	Exploration	PTTEP Shell Brasil Mitsui E&P Brasil	25% 65% 10%	-	-	<ul style="list-style-type: none"> <li>Pending exploration wells drilling permit from the government</li> </ul>

Note: \* PTTEP denotes respective PTTEP subsidiaries participating in the project

\*\* Sales volume represent **average volume for 100% of the project during Q1/2022** except for Algeria 433a & 416b (production volume)

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

# Projects Details | Rest of the World



	Project Name	Status	Phase	Participating Interest* (%)		Sales Vol Gas (MMSCFD)	Sales Vol Liquid (KBPD)	Latest Status
7	BM-ES-23 [Brazil]	JV	Exploration	PTTEP	20%	-	-	• Evaluating petroleum potential for development consideration
				Petrobras	65%			
				INPEX	15%			
8	Block 12 (2.4) [Mexico]	JV	Exploration	PTTEP	20%	-	-	• Evaluating petroleum potential for development consideration
				PC Carigali Mexico	60%			
				Ophir Mexico	20%			
9	Block 29 (2.4) [Mexico]	JV	Exploration	PTTEP	16.67%	-	-	• Pre-development study in progress
				Repsol Mexico	30%			
				PC Carigali Mexico	28.33%			
				Wintershal DEA	25%			
10	Block 17/06 [Angola]	JV	Pre-development	PTTEP	2.5%	-	-	• FID plan in the mid 2022 for the eastern area
				TotalEnergies	30%			• Finalized Internal committees and Stakeholders alignment leading to Begonia FID
				Sonangol	30%			• Launched Forsythia and Gardenia development study on 18 January 2022
				SSI	27.5%			
				Acrep	5%			
				Falcon Oil	5%			
11	Dunga [Kazakhstan]	JV	Production	PTTEP	20%	2	11	• Procurement process Compression package and Gathering Lines
				TotalEnergies	60%			• Engineering of Separation Upgrade, Flare package and facilities
				OOCEP	20%			• Facilities modification works

Note: \* PTTEP denotes respective PTTEP subsidiaries participating in the project

\*\* Sales volume represent **average volume for 100% of the project during Q1/2022**

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

# Projects Details | Mid-stream

Note: PTTEP denotes respective PTTEP subsidiaries participating in the project

Sales volume represent **average volume for 100% of the project during Q1/2022**



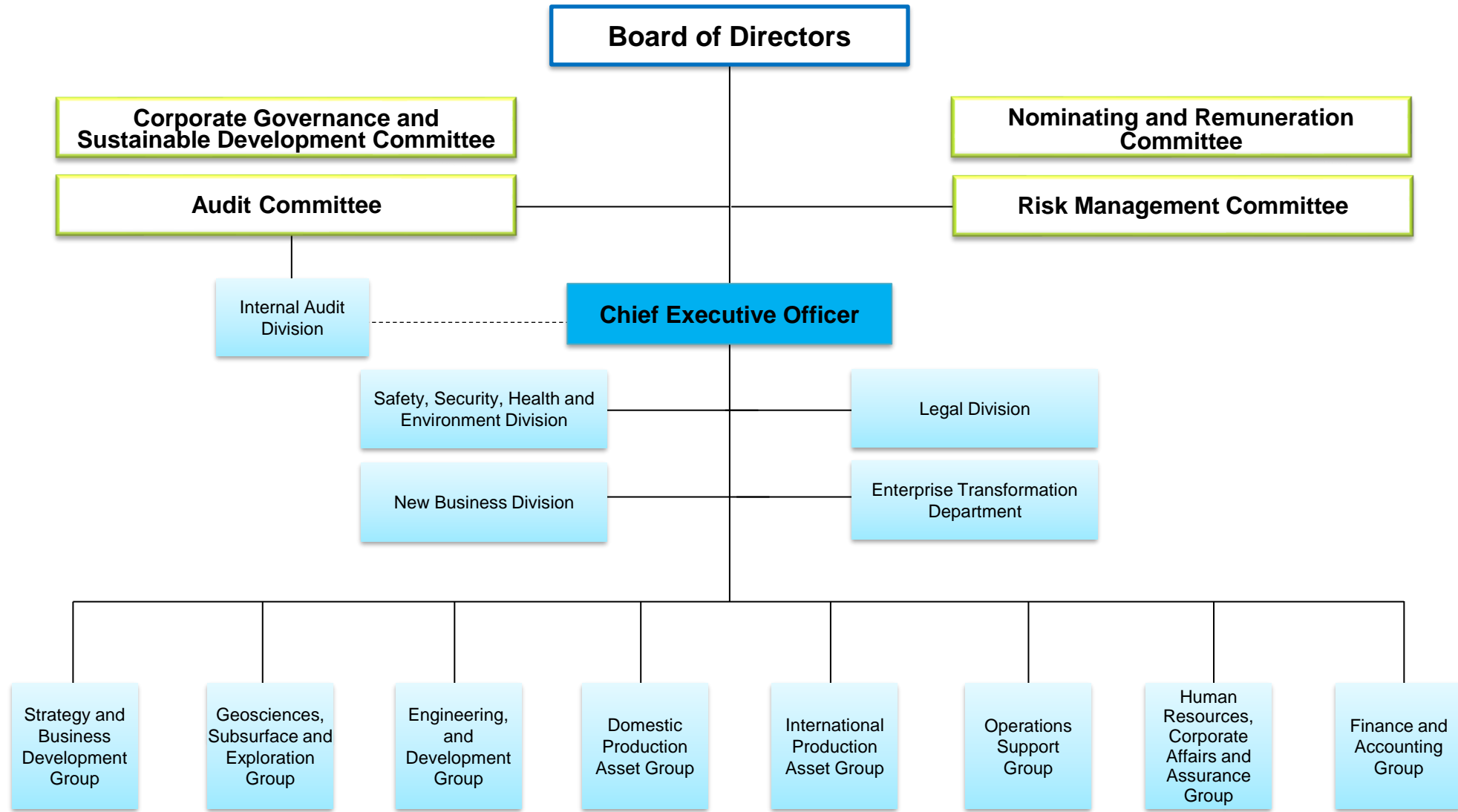
	Project Name	Status	Phase	Participating Interest* (%)		Sales Vol Gas (MMSCFD)	Sales Vol Liquid (KBPD)	Latest Status
1	Oman LNG [OMAN]	Shareholder	Production	PTTEP	2%	-	-	• Normal Operations
				Government of Oman	51%			
				Shell	30%			
				TotalEnergies	5.54%			
				Korea LNG	5%			
				Mitsubishi	2.77%			
				Mitsui	2.77%			
				Itochu	0.92%			
2	ADNOC Gas Processing [UAE]	JV	Production	PTTEP	2%	-	-	• Normal Operations
				ADNOC	68%			
				Shell	15%			
				TotalEnergies	15%			

Note: \* PTTEP denotes respective PTTEP subsidiaries participating in the project

\*\* Sales volume represent **average volume for 100% of the project during Q1/2022**

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

# Organization Chart



# Ratio and 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	5-Yr Additional Proved Reserves / 5-Yr Production Volume
Replacement Ratio	
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

Crude oil	To convert					
	Tonnes (metric)	Kilolitres	Barrels	US gallons	Tonnes/year	
From	Multiply by					
Tonnes (metric)	1	1.165	7.33	307.86	-	
Kilolitres	0.8581	1	6.2898	264.17	-	
Barrels	0.1364	0.159	1	42	-	
US gallons	0.00325	0.0038	0.0238	1	-	
Barrels/day	-	-	-	-	49.8	
Natural gas and LNG	To convert					
	Billion cubic Metres NG	Billion cubic feet NG	Million tonnes oil equivalent	Million tonnes LNG	Trillion BTU	MBOE
From	Multiply by					
1 billion cubic metres NG	1.000	35.315	0.860	0.735	34.121	5.883
1 billion cubic feet NG	0.028	1.000	0.024	0.021	0.966	0.167
1 petajoule NG	0.028	0.981	0.024	0.021	0.952	0.164
1 million tonnes oil equivalent	1.163	41.071	1.000	0.855	39.683	6.842
1 million tonnes oil LNG	1.360	48.028	1.169	1.000	46.405	8.001
1 trillion British thermal units	0.029	1.035	0.025	0.022	1.000	0.172
1 million barrels oil equivalent	0.170	6.003	0.146	0.125	58.000	1.000