



Executive Summary

With the challenges arising from the outbreak of COVID-19 variant, digital technology disruption and energy transition, PTTEP strives to operate under its strategy to enhance competitive advantage and promote sustainability, with the commitment to become a low carbon footprint organization to mitigate possible impacts from global warming and climate changes. As at the end of 2021, PTTEP had achieved greenhouse gas intensity reduction by 24.1% comparing with the target of 25% by 2030. With the operations mostly located offshore, PTTEP aims to be a leader in conservative restoring and monitoring natural resources and marine ecosystems to support economic growth and quality of life of the nearshore communities. In 2021, the company has made progress on the Net Positive Impact on Ocean Biodiversity and Ecosystem Services (Ocean BES) in domestic offshore operations by implementing, for example, Coastal Conservation Area and Fish Home Project, Mangrove Forestation Project, and H.T.M.S Under Water Learning Site Project. These projects have contributed in the reduction of environmental impact in company's offshore operations with the value of 29.5% improvement compared to the negative impacts of base year 2019. Moreover, to support the fight against COVID-19, PTTEP has applied its knowledge and technology to protect medical professionals and prevent the proliferation of virus and has earmarked over 110 million Baht both directly and indirectly to related organization in Thailand and other countries.

For the core E&P operational performance, PTTEP had a remarkable achievement in Malaysia from the start of production in Sabah H Project in Q1/2021, the gas discovery in Sarawak SK410B Project that was higher than previously estimated, and the new petroleum discoveries in 3 projects located in offshore Sarawak. PTTEP successfully acquired interest in Oman Block 61 Project, a large natural gas production field in Sultanate of Oman. As a result, these aforementioned achievements had contributed to the sales volume in 2021 to be at 416,141 barrels of oil equivalent per day (BOED), 18% increase from the previous year. With regards to the transition of operations for G1/61 Project (Erawan field) in Thailand, PTTEP had made necessary preparations for when the site access is allowed the set-up of wellhead platforms and pipeline installation can be completed quickly in order to produce as committed. In December 2021, we signed agreements related to the site access and transition with the current concessionaire and have entered the site since the beginning of 2022 to execute the operations under the signed agreements.

Regarding beyond E&P businesses, PTTEP focuses on developing technology and research and development capabilities that will enhance its current business. This includes the acceleration of AI and Robotics business expansion, electricity business and new forms of energy. In 2021, PTTEP had established subsidiaries to support the investment and expansion of these new businesses.

With all of the above achievements, PTTEP, as a result, had recorded a better financial performance in 2021, comparing to the previous year. The main contribution was from higher average sales volume supported by new projects, higher average selling price that rose to 43.49 USD/BOE reflecting continuously rising global crude oil price, and our lower unit cost at 28.52 USD/BOE. In 2021, PTTEP had recognized asset impairment loss 183 MMUSD from the Mozambique Area 1 and Yetagun projects. As at year-end 2021, PTTEP reported total assets of 23,445 MMUSD, of which 2,559 MMUSD was cash on hand, while total liabilities were reported at 11,017 MMUSD, of which 4,094 MMUSD was interest-bearing debt. Total shareholders' equity stood at 12,428 MMUSD with debt-to-equity ratio at 0.33, reflecting strong and healthy financial structure.

Table of key financial results

(Unit: Million US Dollar)	2021	2020	% Inc. (Dec.) YTD	Q3 2021	Q4 2021	Q4 2020	% Inc. (Dec.) QoQ	% Inc. (Dec.) YoY
Total Revenue	7,314	5,357	37	1,784	1,989	1,348	11	48
Sales Revenue *	6,731	5,043	33	1,744	1,867	1,292	7	45
EBITDA **	4,996	3,512	42	1,297	1,330	829	3	60
Profit (loss) for the period	1,211	720	68	292	321	81	10	>100
Basic earnings(loss) per share (Unit: US Dollar)	0.30	0.18	67	0.07	0.08	0.02	14	>100
Profit(loss) from normal operation	1,479	781	89	335	513	168	53	>100
Profit(loss) from non-recurring items	(268)	(61)	>(100)	(43)	(192)	(87)	>(100)	>(100)

* Included deemed income for tax payment by Oman government for 2021, Q3/2021 and Q4/2021 but were excluded in the average sales volume and selling price calculation

** Excluded gain from a bargain purchase of Oman Block 61 Project, partial write-off of exploration and evaluation assets of the exploration project in Brazil and impairment loss on assets and goodwill.



Economic Overview in 2021

Crude Oil Price

Crude price is one of the major factors affecting the Company's performance. In 2021, average Dubai crude price advanced to 69.4 USD per barrel, higher than 2020 average price of 42.3 USD per barrel. This was mainly due to global demand recovery, which was rising faster than supply from increasing COVID-19 vaccination rates and loosening pandemic-related restrictions. The strong OPEC+ compliance, in the meantime, helped balance the oil market.

During Q1/2021, crude price resumed its uptrend thanked to OPEC+ 's deal to cut production output by 7.2 million barrels per day for January 2021 together with 1 million barrels per day voluntary cut by Saudi Arabia from February to April 2021 despite rising COVID-19 cases as well as delays in vaccinating to public dampened crude demand consumption. In addition, U.S. shale oil producers still have low reinvestment rate and the cold snap at the beginning of 2021 in Texas area caused oil production shut in, which also led to temporary supply shortage. In Q2/2021, lockdown ease in U.S. and Europe from higher COVID-19 vaccination rate including low daily COVID-19 cases accelerated faster-than-expected economic recovery. Furthermore, OPEC+'s cautious policy to gradually unwind its cut raised tight supply concerns and resulted in increased Dubai crude price to an average of 67 USD per barrel.

Dubai crude price in Q3/2021 moderately improved to an average of 71.7 USD per barrel largely due to global demand recovery from lockdown ease and travel seasons in U.S. and Europe. All-time high gas price in September also prompted consumers to switch from using gas to oil. On the supply side, OPEC+ agreed to limit collective production boost to help alleviate tight supply, offsetting with impacts from hurricane Ida which devastated U.S. Gulf of Mexico crude production. Dubai crude price in Q4/2021 consequently hit a 3-year record high, surpassing 84 USD per barrel in October, while U.S. and other major economies decided to release oil from strategic petroleum reserves after their pleas for OPEC+ producers to pump more crude were rejected. At the end of the year, the emergence of the COVID-19 Omicron variant sparked a steep sell-off in oil, roughly 10 USD per barrel decrease. However, studies showed that Omicron variant is less severe and cause lower hospitalization rate than Delta variant, impact on global oil demand shall be limited. Fading concerns picked up Dubai crude price to an average of 78.3 USD per barrel in Q4/2021.

Liquefied Natural Gas (LNG)

For LNG Market in 2021, the average Asian Spot LNG price increased to approximately 19 USD per MMBTU, with the lowest level in Q1/2021 at around 5.6 USD per MMBTU driven from lower demand caused by COVID-19 outbreak. However, from mid-year onwards, the Asian Spot LNG Price has dramatically increase which peak at around 56 USD per MMBTU in October. This was mainly due to the boosted demand from freezing temperatures during winter in Europe, depleted gas storage in the region and limited supply of gas from Russia to Europe, as well as LNG supply shortage caused by shut down of several LNG projects. For the global LNG market in 2021, total capacity was at 395 million tons per annum (MTPA) (2020: 363 MTPA), while LNG demand remained at approximately 393 MTPA (2020: 362 MTPA). (Source: FGE as of December 2021)

Thailand's Energy Demand

Thailand's energy demand from January to October 2021 was reported at 2 million BOE, a decrease of 1% relative to the same period of the previous year (Source: EPPO, The Ministry of Energy), largely due to decreasing in oil demand from COVID-19 impact while increase using natural gas in industrial sectors and gas separation plants including using coal in industrial sector.

Exchange Rates (Thai Baht against US Dollar)

The THB against USD weakened in 2021 from 29.93 to close at 33.42 THB/USD by year end. The major factor influencing THB continues to be the economic impact of the pandemic in 2021 which saw the introduction of new variants including Delta and Omicron. Covid-19 daily infection numbers in Thailand began rising in Q2 2021 and peaked in Q3 2021 at over 20,000 cases per day. However, this number had been steadily declining over the latter half of 2021 which saw the November country reopening and various easing of lockdown measures. Under this pandemic backdrop which depreciates the THB, Thailand's government and Bank of Thailand continue to exercise fiscal and monetary policy measures to support the economy. However, with Bank of Thailand's decision to keep the policy rate at 0.5% as the US Federal Reserve plans for a hawkish 2022, THB faces further downward pressure.

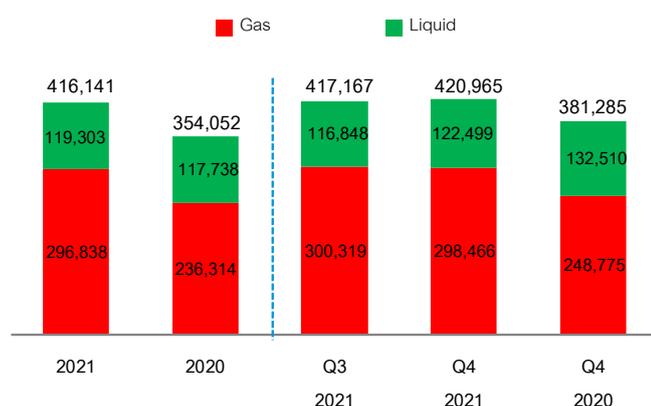


Financial Performance

Average Sales Volume and Selling Price

Unit: Barrels of Oil Equivalent per Day

By Product Type



By Geographical Region



Average selling price and Dubai crude oil price (Unit : US Dollar)	2021	2020	% Inc. (Dec.) YTD	Q3 2021	Q4 2021	Q4 2020	% Inc. (Dec.) QoQ	% Inc. (Dec.) YoY
Average selling price (/BOE)	43.49	38.92	12	44.25	46.87	36.85	6	27
Liquid price (/BOE)	66.70	41.55	61	69.16	76.17	42.61	10	79
Gas price (/MMBTU)	5.69	6.27	(9)	5.76	5.81	5.63	1	3
Average Dubai crude oil price (/BBL)	69.39	42.27	64	71.68	78.27	44.64	9	75

Remark: The average sales volume and selling price for Q3/2021, Q4/2021 and 2021 were excluded deemed income for tax payment by Oman government.

For 2021 compared with 2020

In 2021, the average sales volume increased to 416,141 barrels of oil equivalent per day (BOED) when compared with the same period of 2020 (2020: 354,052 BOED). The increase was primarily from the acquisition of Oman Block 61 Project in March 2021, including Bongkot Project, Contract 4 Project and Arthit Project which had higher gas nomination from buyer, together with Malaysia Project from Malaysia Block H Project first gas production in February 2021 coupled with 12% increase in average selling price to 43.49 USD/BOE in 2021 (2020: 38.92 USD/BOE).

For the Fourth quarter of 2021 compared with the Third quarter of 2021

In Q4/2021, the average sales volume increased to 420,965 BOED when compared with Q3/2021 of 417,167 BOED primarily from Malaysia Project due to higher sales of crude oil and MTJDA Project higher gas nomination from buyer, offset with Zawtika Project due to a decrease in sales from maintenance shutdown. The average selling price in Q4/2021 increased by 6% to 46.87 USD/BOE (Q3/2021: 44.25 USD/BOE).

For the Fourth quarter of 2021 compared with the Fourth quarter of 2020

When compared the average sales volume for Q4/2021 to Q4/2020 of 381,285 BOED, the average sales volume increased primarily from the acquisition of Oman Block 61 Project and Malaysia Project from first gas production of Malaysia Block H Project, offset with Bongkot Project due to lower gas nomination from buyer. The average selling price in Q4/2021 increased by 27% to 46.87 USD/BOE (Q4/2020: 36.85 USD/BOE).

Overall Operating Results

For 2021 compared with 2020

In 2021, PTTEP and its subsidiaries (the Group) recorded net profit of 1,211 MMUSD, an increase of 491 MMUSD or 68% from a net profit in 2020 of 720 MMUSD primarily due to increase in revenue from sales and a recognition of gain from a bargain purchase of Oman Block 61 Project, offset with loss on financial instruments (2020: recognized gain), together with increases in exploration expenses and impairment loss on assets. The net profit for 2021 of 1,211 MMUSD can be separated as following.

The profit from normal operation in 2021 was 1,479 MMUSD, an increase of 698 MMUSD when compared with a profit in 2020 of 781 MMUSD resulted from increase in sales revenue from 1,688 MMUSD, primarily from petroleum sales revenue with 18% increase in average sales volume and 12% increase in average selling price. On the other hand, income taxes increased by 769 MMUSD mainly from higher profit from projects in Thailand and Oman Block 61 Project regarding a gradual recognition of non-cash expense from deferred tax assets. In addition, petroleum royalties increased by 119 MMUSD, primarily from higher domestic sales, along with 116 MMUSD increase in depreciation, depletion and amortization which was primarily from the acquisition of Oman Block 61 Project and S1 Project due to additional completed assets, offset with a decrease from Bongkot Project.

Loss from non-recurring items in 2021 was 268 MMUSD, an increase of 207 MMUSD when compared with a loss in 2020 of 61 MMUSD primarily from loss on financial instruments of 333 MMUSD of which loss of 234 MMUSD during 2021 mainly from oil price hedging instruments due to an upward trend of oil price, offset with gain on foreign exchange forward contracts due to the depreciation of Thai Baht against USD. On the other hand, gain of 99 MMUSD was recognized during 2020, primarily from oil price hedging instruments due to a downward trend of oil price. In addition, there was a recognition of exploration expenses from partial write-off of exploration and evaluation assets of the exploration project in Brazil amounting to 145 MMUSD, together with additional impairment loss on assets of 92 MMUSD. In 2021, the Group recognized impairment loss on Mozambique Area 1 Project and Yetagun Project while loss in 2020 was mainly from Mariana Oil Sands Project and Yetagun Project. Nevertheless, there was gain from a bargain purchase of Oman Block 61 Project amounting to 342 MMUSD in 2021.

For the Fourth quarter of 2021 compared with the Third quarter of 2021

In Q4/2021, the Group had net profit of 321 MMUSD, an increase of 29 MMUSD or 10% from a net profit in Q3/2021 of 292 MMUSD primarily from an increase in revenue from sales, together with a decrease in depreciation, depletion and amortization, offset with impairment loss on assets (Q3/2021: no recognition). The net profit for Q4/2021 of 321 MMUSD can be separated as following.

The profit from normal operation in Q4/2021 was 513 MMUSD, an increase of 178 MMUSD when compared with a profit in Q3/2021 of 335 MMUSD from an increase in revenue from sales of 123 MMUSD, primarily from petroleum sales revenue with 6% increase in average selling price and a slight increase in average sales volume. In addition, other income increased by 85 MMUSD, primarily from an increase in participating interests of Malaysia Block K Project, together with a decrease in depreciation, depletion and amortization of 186 MMUSD primarily from Bongkot Project. On the other hand, income taxes increased by 125 MMUSD mainly from higher profit from projects in Thailand, Malaysia Project, and projects in Oman. Partial income tax of Oman Block 61 Project was a gradual recognition of non-cash expense from deferred tax assets.

The loss from non-recurring items in Q4/2021 was 192 MMUSD, an increase of 149 MMUSD when compared with a loss in Q3/2021 of 43 MMUSD due to recognition of impairment loss on assets of 183 MMUSD on Mozambique Area 1 Project and Yetagun Project (Q3/2021: no recognition), offset with gain on oil price hedging instruments of 5 MMUSD due to a downward trend of forward oil price while Q3/2021 recognized loss of 41 MMUSD due to an upward trend of forward oil price.

For the Fourth quarter of 2021 compared with the Fourth quarter of 2020

In Q4/2021, the Group had net profit of 321 MMUSD, an increase of 240 MMUSD or 296% from a net profit in Q4/2020 of 81 MMUSD was primarily from an increase in revenue from sales, together with decreases in depreciation, depletion and amortization and loss on financial instruments, offset with an increase in impairment loss on assets. The net profit for Q4/2021 of 321 MMUSD can be separated as following.

The profit from normal operation in Q4/2021 was 513 MMUSD, an increase of 345 MMUSD when compared with a profit in Q4/2020 of 168 MMUSD was from an increase in revenue from sales of 575 MMUSD, primarily from revenue from petroleum sales with 27% increase in average selling price and 10% increase in average sales volume. In addition, depreciation, depletion and amortization decreased by 128 MMUSD primarily from Bongkot Project. On the other hand, income taxes increased by 360 MMUSD mainly from higher profit from projects in Thailand, projects in Oman and Malaysia Project. Partial income tax of Oman Block 61 Project was a gradual recognition of non-cash expense from deferred tax assets.

The loss from non-recurring items in Q4/2021 was 192 MMUSD, an increase of 105 MMUSD compared with a loss in Q4/2020 of 87 MMUSD was from an increase in impairment loss on assets of 139 MMUSD. In Q4/2021, the Group recognized impairment loss on Mozambique Area 1 Project and Yetagun Project while Q4/2020 recognized loss on Yetagun Project. However, there was a decrease in loss on financial instruments of 65 MMUSD as the Group recognized gain on oil price hedging instruments due to a downward trend of forward oil price (Q4/2020: recognized loss), together with lower loss on foreign exchange forward contracts since Thai Baht was less appreciated against USD than Q4/2020.

Operating Results by Segments

Net Profit (loss)	2021	2020	% Inc. (Dec.) YTD	Q3 2021	Q4 2021	Q4 2020	% Inc. (Dec.) QoQ	% Inc. (Dec.) YoY
<i>(Unit: Million US Dollar)</i>								
Exploration and production	1,698	868	96	366	401	215	10	87
Southeast Asia	1,576	944	67	324	546	207	69	164
- Thailand	1,220	799	53	271	372	204	37	82
- Other Southeast Asia	356	145	>100	53	174	3	>100	>100
Middle East	426	(13)	>100	32	37	(0.4)	16	>100
Australia	5	(28)	>100	(0.5)	7	(16)	>100	>100
America	(175)	(56)	>(100)	(2)	(23)	(5)	>(100)	>(100)
Africa	(147)	23	>(100)	9	(169)	32	>(100)	>(100)
Others	13	(2)	>100	3	3	(3)	0	>100
Head office and others	(487)	(148)	>(100)	(74)	(80)	(134)	(8)	40
Total	1,211	720	68	292	321	81	10	>100

For 2021 compared with 2020

For 2021, the Group reported a net profit of 1,211 MMUSD, an increase of 491 MMUSD or 68% when compared with a net profit of 720 MMUSD in 2020, primarily from an increase in Exploration and Production segment in Middle East of 439 MMUSD and Southeast Asia (Thailand increased by 421 MMUSD), while there was a decrease in Africa of 170 MMUSD and Head Office and Others segment of 339 MMUSD.

Exploration and Production segment

- Middle East

In 2021, Middle East reported a net profit of 426 MMUSD, a change of 439 MMUSD or more than 100% when compared with a net loss of 13 MMUSD in 2020, primarily from gain from a bargain purchase of Oman Block 61 Project, together with an increase in revenue from sales due to higher average sales volume, primarily from the acquisition of Oman Block 61 Project. However, there was an increase in income taxes mainly from Oman Block 61 Project regarding a gradual recognition of non-cash expense from deferred tax assets. In addition, depreciation, depletion and amortization increased from higher average sales volume.

- Southeast Asia

- Thailand

In 2021, Thailand reported a net profit of 1,220 MMUSD, an increase of 421 MMUSD or 53% when compared with a net profit of 799 MMUSD in 2020, primarily from an increase in revenue from sales due to increases in both average selling price and average sales volume, mainly from Bongkot Project and Contract 4 Project, together with a decrease in depreciation, depletion and amortization, primarily from Bongkot Project. On the other hand, income taxes increased in accordance with an increase in profit and petroleum royalties also increased, primarily from higher revenue from sales.

- Africa

In 2021, Africa reported a net loss of 147 MMUSD, a change of 170 MMUSD or more than 100% when compared with a net profit of 23 MMUSD in 2020, primarily from impairment loss on Mozambique Area 1 Project.

Head Office and Others segment

For 2021, Head Office and Others segment reported a net loss of 487 MMUSD, an increase of 339 MMUSD or more than 100% when compared with a net loss of 148 MMUSD for 2020, primarily from a recognition of loss on financial instruments mainly from oil price hedging instruments due to an upward trend of oil price while 2020 recognized gain due to a downward trend of oil price.

For the Fourth quarter of 2021 compared with the Third quarter of 2021

For Q4/2021, the Group reported a net profit of 321 MMUSD, an increase of 29 MMUSD or 10% when compared with a net profit of 292 MMUSD in Q3/2021, primarily from an increase in Exploration and Production segment in Southeast Asia (Thailand increased by 101 MMUSD and Other Southeast Asia increased by 121 MMUSD) while there was a decrease in Africa by 178 MMUSD.

Exploration and Production segment

- Southeast Asia

- Thailand

In Q4/2021, Thailand reported a net profit of 372 MMUSD, an increase of 101 MMUSD or 37% when compared with a net profit of 271 MMUSD in Q3/2021, primarily from a decrease in depreciation, depletion and amortization, mainly from Bongkot Project, together with an increase in revenue from sales due to higher average selling price while income taxes increased from higher profit.

- Other Southeast Asia

In Q4/2021, Other Southeast Asia reported a net profit of 174 MMUSD, an increase of 121 MMUSD or more than 100% compared with a net profit of 53 MMUSD in Q3/2021, primarily from an increase in revenue from sales due to increases in both average selling price and average sales volume. In addition, other income increased from an increase in participating interests of Malaysia Block K Project.

- Africa

In Q4/2021, Africa reported a net loss of 169 MMUSD, a change of 178 MMUSD or more than 100% when compared with a net profit of 9 MMUSD in Q3/2021, primarily from impairment loss on Mozambique Area 1 Project.

For the Fourth quarter of 2021 compared with the Fourth quarter of 2020

For Q4/2021, the Group reported a net profit of 321 MMUSD, an increase of 240 MMUSD or more than 100% when compared with a net profit of 81 MMUSD in Q4/2020, primarily from an increase in Exploration and Production segment in Southeast Asia (Thailand increased by 168 MMUSD and Other Southeast Asia increased by 171 MMUSD) while there was a decrease in Africa by 201 MMUSD. In addition, Head Office and Others segment increased by 54 MMUSD.

Exploration and Production segment

- Southeast Asia

- Thailand

In Q4/2021, Thailand reported a net profit of 372 MMUSD, an increase of 168 MMUSD or 82% when compared with a net profit of 204 MMUSD in Q4/2020, primarily from an increase in revenue from sales due to higher average selling price. In addition, depreciation, depletion and amortization decreased primarily from Bongkot Project while income taxes increased from higher profit.

- Other Southeast Asia

In Q4/2021, Other Southeast Asia reported a net profit of 174 MMUSD, an increase of 171 MMUSD or more than 100% compared with a net profit of 3 MMUSD in Q4/2020, primarily from an increase in revenue from sales due to higher average selling price. In addition, other income increased from an increase in participating interests of Malaysia Block K Project.

- Africa

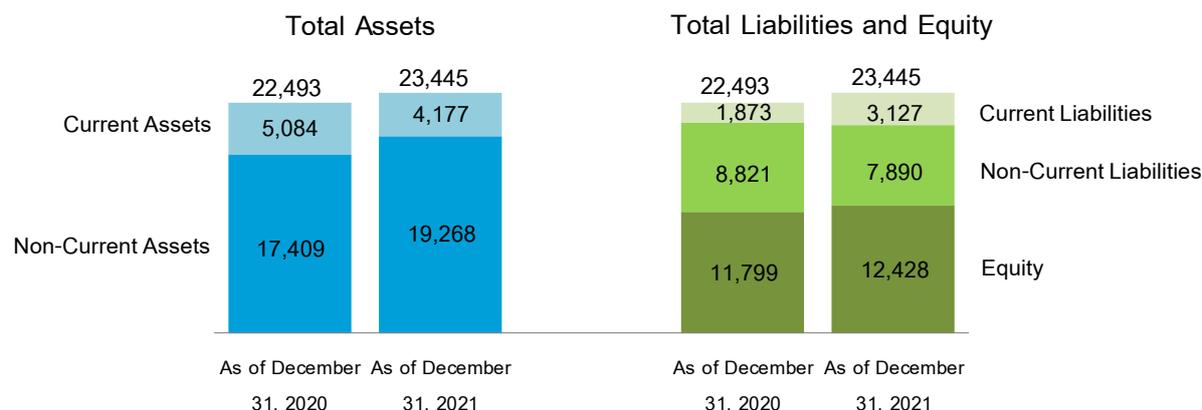
In Q4/2021, Africa reported a net loss of 169 MMUSD, a change of 201 MMUSD or more than 100% when compared with a net profit of 32 MMUSD in Q4/2020, primarily from impairment loss on Mozambique Area 1 Project.

Head Office and Others segment

In Q4/2021, Head Office and Others segment reported a net loss of 80 MMUSD, a decrease of 54 MMUSD or 40% when compared with a net loss of 134 MMUSD in Q4/2020, primarily from lower loss on financial instruments as the Grouped recognized gain on oil price hedging instruments in this quarter due to a downward trend of forward oil price (Q4/2020: recognized loss), together with lower loss on foreign exchange forward contracts since Thai Baht was less appreciated against USD than Q4/2020.

Financial Position

Unit: Million US Dollar



Assets

As at December 31, 2021, the Group had total assets amount of 23,445 MMUSD, an increase of 952 MMUSD from total assets as at December 31, 2020 of 22,493 MMUSD, primarily due to;

- (1) Non-current assets, which were primarily comprised of exploration and production assets in joint venture projects being recognized as part of the property, plant and equipment, exploration and evaluation assets, goodwill and deferred tax assets, an increase of 1,859 MMUSD was mainly due to an increase in property, plant and equipment from the acquisition of Oman Block 61 Project.

While

- (2) Current assets, which were primarily comprised of cash and cash equivalents, trade and other receivables and inventories, a decrease of 907 MMUSD was mainly from a decrease in cash and cash equivalents of 1,145 MMUSD.

Liabilities

As at December 31, 2021, the Group had total liabilities of 11,017 MMUSD, an increase of 323 MMUSD from total liabilities as at December 31, 2020 of 10,694 MMUSD, primarily due to;

- (1) Current liabilities, which were primarily comprised of trade and other payables, income tax payable, and current portion of long-term liabilities, an increase of 1,254 MMUSD was mainly due to an increase in current portion of long-term liabilities of 498 MMUSD from Thai Baht debentures with a maturity in June 2022, income tax payable increased by 278 MMUSD from an increase in profit and short-term provisions increased by 231 MMUSD primarily from decommissioning costs.
- (2) Non-current liabilities, which were primarily comprised of debentures, provision for decommissioning costs and deferred tax liabilities, a decrease of 931 MMUSD was mainly due to a decrease in provision for decommissioning costs of 681 MMUSD, primarily from Bongkot Project. A decrease in long-term debentures of 354 MMUSD from Thai Baht debentures with a maturity in June 2022, offset with an issuance of Thai Baht digital debentures of Baht 6,000 million (equivalent to 180 MMUSD) in Q4/2021, while other non-current liabilities increased by 63 MMUSD and deferred tax liabilities increased by 58 MMUSD mainly due to the acquisition of Oman Block 61 Project.

Equity

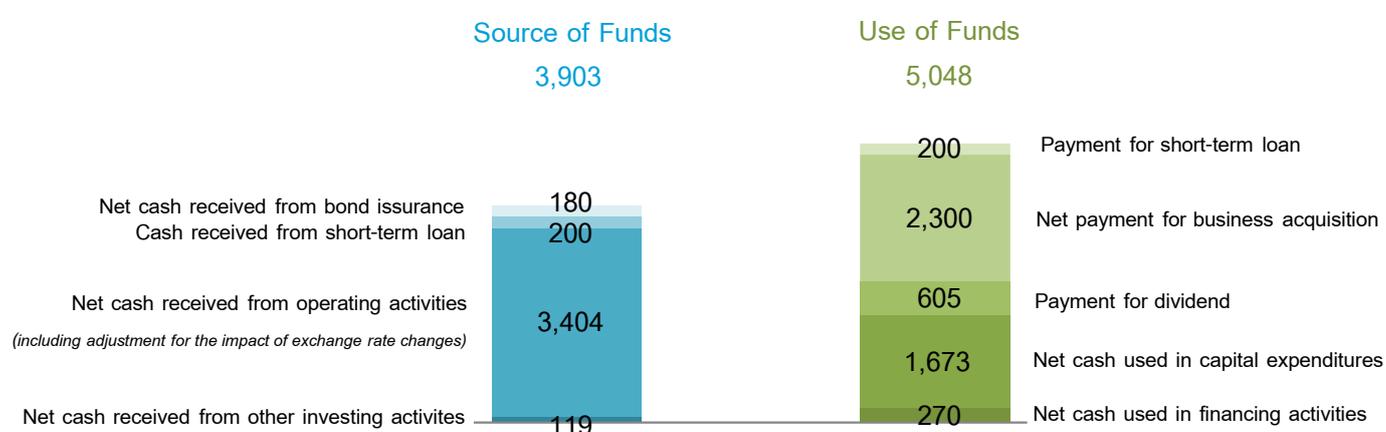
As at December 31, 2021, the Group had equity of 12,428 MMUSD, an increase of 629 MMUSD from equity as at December 31, 2020 of 11,799 MMUSD, primarily due to the net profit for the period, offset with the dividend payments in April and August 2021.

Capital Structure

PTTEP ensures efficiency of its financial management by focusing on building financial discipline and maintaining a strong financial structure. At the end of Q4/2021, the Company maintained cash on hand approximately of 2,559 MMUSD. In addition, the Group maintained its debt-to-equity ratio of 0.33 representing a solid liquidity which was within the Group's financial policies. In addition, the Group offered 5-year name-registered, unsubordinated and unsecured digital debentures with a bondholders' representative in the amount of Baht 6,000 million (equivalent to 180 MMUSD), resulting in lower finance cost from 3.44% to 3.38%. The Company is confident that its solid financial position and high liquidity will enable the Company to withstand such oil price fluctuations and global economic slowdown.

Cash Flows

Unit: Million US Dollar



For 2021

As at December 31, 2021, the Group had cash and cash equivalents* of 2,559 MMUSD, a decrease of 1,145 MMUSD compared with December 31, 2020 of 3,704 MMUSD.

Sources of funds amount 3,903 MMUSD primarily came from **Net cash received from operating activities** as a result of the positive net cash flow from revenue from sales, offset with cash payment for expenses and income taxes as well as net cash received from Oman Block 61 Project after the business acquisition which was in according to the operation plan, **Net cash received from financing activities** derived from short-term loan from financial institution and net cash received from issuance of Thai Baht digital debentures in Q4/2021 and **Net cash received from investing activities** mainly from maturity of short-term investments.

Uses of funds amount of 5,048 MMUSD primarily came from the **Net payment for business acquisition and additional capital expenditures**, from the acquisition of Oman Block 61 Project in Q1/2021 and additional investments in exploration and production assets mainly from S1 Project, Mozambique Area 1 Project and G2/61 Project, as well as **Net cash used in financing activities**, primarily from interest payment. Additionally, there were dividend payments for the second half of 2020 and the first half of 2021, along with repayment of short-term loan from financial institution.

Remark *Exclude short-term investment in the form of bank fixed deposit with a maturity of more than three months but within twelve months of 100 MMUSD as at December 31, 2020.

Key Financial Ratios

	2021	2020	Q3 2021	Q4 2021	Q4 2020
Profitability Ratio (%)					
EBITDA* margin	73.21	68.38	73.24	70.27	63.26
Return on equity	9.99	6.09	8.16	9.99	6.09
Net profit margin	16.55	13.43	14.69	16.55	13.43
Leverage Ratio (Times)					
Debt to equity	0.33	0.33	0.32	0.33	0.33
Debt to EBITDA *	0.80	1.05	0.86	0.80	1.05

* EBITDA excluded gain from a bargain purchase of Oman Block 61 Project, partial write-off of exploration and evaluation assets of the exploration project in Brazil and impairment loss on assets and goodwill.

Remark:

- EBITDA margin = Profit before deduction of interest, tax and depreciation to revenue from sales (included deemed income for tax payment by Oman government for 2021, Q3/2021 and Q4/2021) including revenue from pipeline transportation
- Return on equity = Net profit for the past 12 months to average equity
- Net profit margin = Net profit to total revenue (for the past 12 months)
- Debt to equity = Interest Bearing Debt to equity
- Debt to EBITDA = Average Interest-Bearing Debt to profit before deduction of interest, tax and depreciation for the past 12 months



Operational Highlights

At the end of 2021, PTTEP has over 40 projects with domestic and international operations in 15 countries, with total proved reserves of 1,350 million barrels of oil equivalent (MMBOE) and probable reserves of 773 MMBOE. The following are key project highlights.

Projects in Southeast Asia

PTTEP's primary operational base is in Southeast Asia, with projects located in Thailand, the Republic of the Union of Myanmar (Myanmar), the Federation of Malaya (Malaysia), the Socialist Republic of Vietnam (Vietnam), and the Republic of Indonesia (Indonesia). In Q4/2021, the average sales volume from projects in Thailand is 255,600 BOED, accounting for 61% of total sales volume. Average sales volume from other countries in this region is 98,000 BOED, which accounted for 23% of total sales volume.

- Projects in Thailand

The majority of PTTEP's projects in Thailand, located in the Gulf of Thailand and onshore, are in the *production phase*. Key activities of the main producing projects are as follows. The **S1 Project**, where natural gas, liquefied petroleum gas (LPG) and crude oil are produced, is continuously drilling additional production wells with exploration drilling plan to maintain its production level, after receiving production period extension approval to until March 2031. The environmental impact assessments were also undertaken in both existing and new production areas, as well as the 10 years strategy road map has been approved for the long-term operation. The **Bongkot Project**, **Arthit Project** and **Contract 4 Project**, which produce natural gas, condensate and crude oil, was able to deliver production volumes as nominated from the buyer. For the Bongkot Project, the Company entered into Memorandum of Agreement relating to Bongkot end of concessions (MOA) with TOTAL E&P Thailand, a joint partner of Bongkot project, for the Company to be a sole risk operator for the infill drilling where the company shall recognize all revenues and costs from the petroleum produced. For **G2/61 Project (Bongkot field)** was on track for its transition plan. For **G1/61 Project (Erawan field)**, Although the Company was not allowed to access the site in 2021, the Project continued its transitional efforts including staff recruitments, sales agreement negotiation, procurement activities and platform constructions in preparation for readiness for production and operations. On 20 December 2021, the Company has entered into agreements with the current concessionaire for access the site and since the early of 2022, has continued its operation under the existing agreement to prepare for the development and the site survey for pipeline installation, as well as the operation systems such as the production system and the information technology system.

- Projects in Myanmar

The key *producing projects* in Myanmar include the **Zawtika Project**, a natural gas producing project which located in the Gulf of Moattama in Myanmar, was able to deliver sales and production as per obligation. However, the COVID-19 and turbulence situation in Myanmar have caused some delays in certain activities. PTTEP has monitored the situation closely, identified potential risk, and prepared asset readiness following the Business Continuity Management plan (BCM) to ensure uninterrupted supply of petroleum, including closely coordination with PTT, the Department of Mineral Fuels, Ministry of Energy and Ministry of Foreign Affairs, on a regular basis for immediate mitigation plan. In addition, the Project has been executing Phase 1D Field Development Plan in order to maintain the production level under the contract. Currently, the construction of wellhead platforms is in progress as plan. The **Yetagun Project**, a natural gas and condensate producing project, has resumed its production in October 2021 after the COVID-19 situation improved. The **Yadana Project**, a natural gas producing field, completed two production wells as planned in Yadana and Badamyar fields in 2021 in order to maintain production volume and ensure gas delivery as stated in long-term gas sales agreement. On 21 January 2022, TotalEnergies EP Myanmar as both the partner and current operator, notified for its intention to withdraw from Yadana project and Moattama Gas Transportation Company (MGTC), the gas pipeline company for Yadana project. The withdrawal is expected be completed within 180 days when the official approval has been obtained.

For *exploration project*, the **Myanmar M3 Project**, is currently waiting for PSC Supplementary approval from Myanmar Government and is under necessary preparation for development. On 17 September 2021, Mitsui Oil Exploration Company Limited (MOECO), a joint partner of Myanmar M3 project, notified to withdraw its 20% shareholding interest, in which the withdrawal will be effective from 31 October 2021 according to the Joint Operating Agreement. As a result, PTTEP will have the shareholding interest at 100% in this project, with completion subjected to Myanmar government approval. For **Domestic Gas to Power project**, the project has been facing some delay as a result of local political situation and COVID-19 outbreak. PTTEP is still closely monitoring the situations to assess risks as well as to prepare for an appropriate action plan.

- Projects in Malaysia

The *producing projects* in Malaysia include the **Block K Project**, an oil producing field consisting of Kikeh, Siakap North-Petai (SNP) and Gumusut-Kakap (GK) fields which are located in the deep water offshore Sabah. The main progress is the infill well preparation of SNP, expect to complete in early of 2022. The **Sarawak SK309 and SK311 Project** are oil and gas producing fields located in the shallow water of offshore Sarawak. The new Pemanis Topside was installed, with first gas expected in January 2022. Infill well drilling will take place to increase production from the existing facilities. **Block H Project**, located in the deep-water of offshore Sabah, has started the natural gas production since February 2021 and able to reach full production capacity of 270 MMSCFD.

Exploration projects in Malaysia are highlighted as follows. The **Sarawak SK410B Project** with giant gas discovery in Lang Lebah Field is currently under field development study reflecting larger gas discovery volume such as increasing processing plant capacity, managing higher CO₂ as per GHG aspiration target. Front End Engineering Design (FEED) is expected to be started in early 2022 and the Final Investment Decision is expected to be in 2023. The Project still has several petroleum prospects, which are being studied. The project plan is to drill at least one more exploration well in 2022. The **Sarawak SK417 Project** has successfully made gas discovery at the second exploration well, Nangka-1, following the gas discovery in Dokong field. The Project has planned to drill an appraisal well to evaluate the petroleum potential. The **Sarawak SK405B Project** discovered crude oil and natural gas reservoirs in Sirung-1 well in March 2021. The Project is currently studying on upside petroleum potential in this area for future exploration and appraisal campaign. The **Sarawak SK438 Project** completed Kulintang-1 exploration well in April 2021. The Project discovered a satisfactory reservoir of natural gas and will continue to study on additional appraisal program and development plan for this field. In addition, exploration well drilled at Mak Yong-1 was completed in June 2021 and petroleum potential in that area is being evaluated. Currently, the project is studying on new potential candidates for next exploration campaign. The **Sarawak SK314A project** is in progress of evaluating field's resources potential and performing 3D seismic reprocessing in order to prepare for the drilling of 2 exploration wells in 2022 exploration campaign. The **PM407 Project** is performing 3D seismic reprocessing together with the studies on petroleum potential. Currently, the project is progress of planning for the future exploration strategy and way forward. The **PM415 Project** has been evaluated the remaining of petroleum potential which will result in the upcoming exploration strategy in the near future.

- Projects in Vietnam

The key *Producing Projects* in Vietnam include the **Vietnam 16-1 Project**, which is natural gas and crude oil field, located offshore in the southeast region of Vietnam. The Project completed drilling campaign of 4 development wells in Q3 - Q4/2021. For *Exploration Projects*, the **Vietnam B & 48/95 Project** and the **Vietnam 52/97 Project**, located offshore, are currently in the negotiation process on commercial terms in order to push forward the Final Investment Decision (FID). The projects have production capacity approximately 490 MMSCFD.

Projects in the Middle East

PTTEP's project highlights in this region are located in Sultanate of Oman (Oman) and United Arab Emirates (UAE).

The projects in Oman under *production phase* include the **PDO (Block 6) Project**, which is the largest potential onshore oil producing asset in Oman, and the **Mukhaizna (Block 53) Project**, which is a large producing onshore oil field located in the southern part of Oman. In 2021, both projects continue to produce as per OPEC+ agreement. For **Oman Block 61 Project**, with its natural gas and

condensate resources, the Company has signed a Sale and Purchase Agreement (“SPA”) to acquire 20% stake from BP Exploration (Epsilon) Limited (“BP”), which completed on 23 March 2021. The Project currently has a full production capacity of natural gas and condensate at 1,500 MMSCFD and 69,000 Barrels per day (BPD), respectively. For *Exploration Projects*, **Oman Onshore block 12 Project** continues the geological and geophysical studies throughout the year 2022 and plan to drill two exploration wells in 2023.

All of the projects in UAE are under *exploration phase*, located offshore in the northwest of Abu Dhabi. The **Abu Dhabi Offshore 1 Project** is currently being evaluated for petroleum potential for future exploration. The **Abu Dhabi Offshore 2 Project** has started drilling an exploration well in September 2021. Currently, the Project is preparing to drill one appraisal well, including further evaluation of petroleum potential for drilling another exploration well in 2022. The **Abu Dhabi Offshore 3 Project** is in progress of petroleum potential evaluation for the preparation of appraisal well and exploration well which to be drilled in 2023-2024. For the **Concession Area C**, the Company has signed Farm-in/Farm-out Agreement to acquire 25% stake from Eni Sharjah B.V. (“ENI”) with the expected completion date in early 2022. After completion, the participation interest for this project will be as follow; ENI (Operator) 50%, SNOC 25% and PTTEP MENA 25%.

Projects in the Americas

PTTEP’s exploration projects in this region are located in Canada, the Federative Republic of Brazil (Brazil) and United Mexican States (Mexico).

The **Mariana Oil Sands Project** is located in Alberta, Canada. The Project has the direction to surrender all mineral leases. Therefore, the well abandonment campaign was completed, and the project is underway for reclamation activities according to government’s conditions.

Projects in Brazil include the **Barreirinhas AP1 Project** located in the Barreirinhas Basin, offshore of the northeastern region of Brazil, is waiting for exploration wells drilling permit from the government. The **Brazil BM-ES-23 Project** located offshore in the Espirito Santo basin, east of Brazil, is currently evaluating the petroleum potential for further development. For the **Potiguar Project**, in July 2021, the Company had entered into a Sale and Purchase Agreement (SPA) to sell the Project, which completed on 29 October 2021.

Projects in Mexico include the **Mexico block 12 (2.4) Project** which is located in the Mexican Ridges, Western Gulf of Mexico. The exploration well drilling was completed according to work commitment under the concession on 16 October 2021, with no petroleum potential confirmed. The **Mexico block 29 (2.4) Project** is located in the Campeche basin. The drilling plans for one appraisal well and one exploration well were approved by the Mexican government, and the drilling of both wells had already completed. The exploration well confirmed no petroleum potential, while the appraisal well had confirmed hydrocarbon potential for further development. Currently, it is in progress on pre-development study.

Projects in Australia

PTTEP has one project in this region which is the **PTTEP Australasia Project**. This project is located in the Commonwealth of Australia (Australia) and has 6 permits.

The **Cash Maple Field and Orchid Field**, which are in exploration phase, are currently in progress to define proper direction of the project in order to increase the opportunity for development.

With regards to a claim made against PTTEP AAA in the Federal Court of Australia seeking damages on behalf of a group of Indonesian seaweed farmers (Class Action) for compensation relating to the Montara oil spill incident in 2009, On 19 March 2021, and 25 October 2021, the trial judge of the Federal Court of Australia delivered judgements in the class action. Final Orders were made by the trial judge on 15 November 2021. After careful consideration of the judgements, PTTEP AAA has exercised its right to appeal and filed a Notice of Appeal in the Federal Court of Australia on 13 December 2021.

Projects in Africa

PTTEP's projects in this region are in the People's Democratic Republic of Algeria (Algeria) and the Republic of Mozambique (Mozambique).

The **Algeria 433a and 416b Project**, which is in the *production phase*, is located onshore in the eastern part of Algeria with crude oil producing. In 2021, OPEC+ continued production quota cut along with plant full shutdown for 3-yearly preventive maintenance. Consequently, the project's average production for crude oil in 2021 is at approximately 16,300 BPD.

The **Algeria Hassi Bir Rekaiz Project**, which is in the *development phase*, is located onshore in the eastern part of Algeria. The project has started the development on Phase 1 following the conclusion from an approved development plan by the government in Q1/2019. The project is currently under construction and drilling production wells with expected first oil production for the initial phase of around 10,000-13,000 BPD in early 2022. In the second phase, production capacity is planned to ramp up to around 50,000-60,000 BPD in 2026-2027. In addition, the acquisition of additional participating interest of 24.5% from CNOOC was approved and announced by the government of Algeria in August 2021, resulting the increase in PTTEP's stake from 24.5% to 49%. SONATRACH, the national state-owned oil company of Algeria, remains the joint venture partner with the participating interest of 51%.

The **Mozambique Area 1 Project**, which is a large LNG project located in offshore Mozambique, is currently in the development phase. In 2021, the project has commenced foundation work for onshore LNG facilities, temporary Beach Landing, subsea pipeline dredging and construction of security infrastructures. The project finance close and the first debt drawdown had been achieved. However, due to the security situation in city of Palma since March, which is close to the project construction site, in April, Force Majeure was then declared, to suspend all construction works at the site, for safety reason of all employees and stakeholders. The operator has set up a dedicated taskforce to study the impacts for determining further plans and directions. In June, South African Development Committee - SADC) and the Rwanda Defense Force (RDF) has deployed military to support Mozambique to deal with the situation. The troops are currently stationed in the area and are undergoing military action to restore security in the north of the country and surrounding project's areas. Presently, the operator is in close monitoring of the situation with the government in order to prepare for the swift and safe project resumption.



Strategies under Sustainable Development Framework

PTTEP adheres to the Sustainable Development global practices and UN principles. Operating under the concept FROM “WE” to “WORLD” in order to become the “sustainable organization” that takes conscious consideration of all stakeholders’ interests, maintains energy security, delivers value and fosters sustainability for the wider society and to be in line with the vision to become the “Energy Partner of Choice”. In 2021, PTTEP was recognized as a member of Dow Jones Sustainability Index (DJSI) in the Oil and Gas Upstream & Integrated Industry sector for the eighth consecutive year and also a constituent of the FTSE4Good Index Series for the sixth consecutive year. Domestically, PTTEP received Best Sustainability Awards from SET Awards 2021 in the category of Sustainability Excellence for the second consecutive year and was listed in 2021 Thailand Sustainability Investment (THSI) for the sixth year by the Stock Exchange of Thailand (SET).

PTTEP has established our sustainable development framework which comprises of three main components namely: High Performance Organization (HPO); Governance, Risk Management and Compliance (GRC); and Stakeholder Value Creation (SVC). Key highlights are as follows:

High Performance Organization and Thrive in Lower Carbon Future

(1) Sustainable E&P Business Strategy

- Create additional value from existing assets with an emphasis on increasing production from key projects especially Thailand gas projects aiming to ensure national energy security as well as serve domestic demand. PTTEP constantly and closely collaborates with relevant parties and the government for G1/61 site access in order to prepare production readiness. In December, PTTEP signed agreements aimed at facilitating smooth transition of operatorship so that PTTEP can access G1/61 site ahead of the commencement in April 2022. In Q4/2021, PTTEP successfully made another discovery in offshore Sarawak, Malaysia from exploration well, Nangka-1 at Sarawak SK 417 project. This block is adjacent to Sarawak SK 405B, Sarawak SK 410B, Sarawak SK 438, Sarawak SK 314A, and Sarawak SK 309 and SK 311 projects. All of those blocks are operated by PTTEP. With the existing facilities nearby, PTTEP therefore can leverage this advantage for future development and as a cluster development.
- Continuously maintain competitive unit costs by using digital technology and increasing work effectiveness to strengthen PTTEP’s core business amid the increasingly volatile environment of the industry
- Expand investments in Thailand and Southeast Asia where PTTEP targets as strategic investment areas and looks to expand business opportunities in Gas Value Chain
- Capture investment opportunity with strategic alliance in the Middle East i.e. Oman and UAE, where it has low-cost base as the advantage relative to other producing regions. In Q4/2021, PTTEP has signed Farm-in Agreement with ENI Sharjah B.V. to acquire 25% stake in the Sharjah Area C, which is an onshore gas and condensate block in exploration phase, located in the Emirate of Sharjah, UAE. This transaction aligns with PTTEP’s investment strategy, focusing on prolific area in the Middle East.
- Drive LNG value chain to focus on the upstream and liquefaction plants including to become LNG shipper and develop LNG capabilities via PTT Global LNG Limited (“PTTGL”)

(2) Diversification to Beyond E&P Business Strategy

- Scale up AI and Robotics Ventures Company Limited (ARV) and accelerate products and services to market
- Explore Power business opportunities for Gas/LNG and renewable in Vietnam and Myanmar
- Explore business opportunities in Carbon Capture Utilization and Storage (CCUS) leveraging PTTEP's expertise as well as investments in future energy i.e. Hydrogen
- Commercialize in-house technology that have been researched and developed to support E&P operations

To support future investment Beyond E&P Business, in Q4/2021, PTTEP has established 3 subsidiaries, which are (1) FutureTech Energy Ventures Company Limited (2) FutureTech Solar (Thailand) Company Limited and (3) Delta Gas Transportation Limited. Furthermore, in 2021, ARV has established 4 subsidiaries, namely (1) Rovula (Thailand) Company Limited, (2) Skyller Solutions Company Limited, (3) Varuna (Thailand) Company Limited, and (4) Cariva (Thailand) Company Limited, including having 33% shareholding in AeroSky (Thailand) Company Limited, the joint venture company between ARV, Aerodyne Group from Malaysia, and Digital Creation Co., Ltd., to provide drone solution services in Thailand.

- (3) **Greenhouse Gas Management Strategy** PTTEP commits to manage greenhouse gas to mitigate possible impacts from global warming and climate change. PTTEP aims to reduce its greenhouse gas emissions intensity by at least 25% by 2030, compared to the 2012 base year. As of the end of 2021, the Company reduced greenhouse gas emissions intensity by 24.1% through production process improvement and new initiatives e.g. flare gas recovery and utilization, energy efficiency improvement, production efficiency improvement, reducing methane leakage from production processes, as well as application of renewable energy in operations including the feasibility study of Carbon Capture Utilization and Storage in our offshore operations. In addition, PTTEP is currently considering on the long-term plan of reducing greenhouse gas emissions to pursue with Net Zero or Carbon Neutrality target in the future.

PTTEP places great importance on effective financial management by focusing on building financial discipline and maintaining a robust capital structure. As at the end of 2021, the Company maintained a strong liquidity position with cash on hand of approximately 2,559 MMUSD. The debt-to-equity ratio is 0.33x which is in line with the Company's financial policy. In addition, the Company has successfully offered 5-year name-registered, unsubordinated, and unsecured digital debentures with a bondholders' representative in the amount of 6,000 million Baht which reduce the cost of debt from 3.44% to 3.38%. PTTEP is, therefore, confident that its solid financial position and liquidity will enable the Company to withstand such oil price fluctuation and global economic slowdown.

Moreover, PTTEP encourages Research and Development (R&D), technological applications, and innovation to increase the efficiency and competitiveness of the petroleum exploration and production business. The main objectives of R&D include unlocking high CO₂ reserves, removing contaminants in condensate, enhancing oil recovery, reducing environmental impact, reducing decommissioning cost, and improving operation and maintenance efficiency. As of Q4/2021, there are 45 projects under research and development and the progress of highlight projects are as follow;

- The technology for contaminant removal in condensate is successful in field trial tested which consists of the chemical demulsifier injection for particulate contaminants separation, and adsorbent technology. Currently, it is in the process of expanding technology implementation and improving its efficiency.
- The technology for supporting pipeline decommissioning activities such as the decontamination chemicals for pipelines cleaning and intelligent sampling PIG have been field trial tested in Bongkot field from Q4/2021 to Q1/2022, and the performance is satisfactory. The development team will bring the results of the field test to improve and increase efficiency and expanding its use to support future petroleum pipeline decommissioning activities.

- The flare gas utilization by converting to Carbon Nanotube project is in progress to carry out the engineering design for the up-scaled production unit that is planned to construct at S1 Project in 2022.
- The wellhead operator robot project is in the process of developing a prototype robot which has capability to detect equipment abnormalities and to autonomously manipulate the process equipment in the production platform. The project plans to complete the prototype development and testing in offshore production platform by 2022.
- For the infrastructure development to support research and technology development, PTTEP has completed the construction of the PTTEP Technology and Innovation Center (PTIC) in the Eastern Economic Corridor of Innovation (EECi), in December 2021. PTIC consists of a pilot area building, unmanned ariel vehicle (UAV) test field, including equipment and laboratories for research and technology development. PTIC will play a key role in enhancing PTTEP's competitiveness by driving and accelerating the success of technology development and innovation towards industrial implementation.

PTTEP has an environmental management system which is a subset of PTTEP's Safety, Security, Health and Environment Management System (SSHE MS). In Q4/2021, PTTEP Lost Time Injury Frequency (LTIF) was 0.17, while the Total Recordable Incident Rate (TRIR) was 0.75. The LTIF and TRIR were in the average safety performance of the International Association of Oil & Gas Producers (IOGP).

In Q4/2021, PTTEP was presented with the Global Most Innovative Knowledge Enterprise Award 2021 or Global MIKE Award 2021 from the Hong Kong Polytechnic University. PTTEP also won the National Innovation Awards 2021 as the 2nd runner-up in the social and environmental category for the private sector. This award was granted to the CARTIER project, which is the carbon nanotubes conversion process from flare gas. In addition, PTTEP received 2 awards from Thailand HR Excellence Awards 2021, which was jointly organized by Human Resources Online and Singapore-based Lighthouse Independent Media. The awards comprise of Gold level in Excellence in Talent Acquisition Award and Bronze level in Excellence in Workplace Culture. These prestigious awards are recognition of the strength of PTTEP's stance in creation of innovation and a systematic process as well as solid proof to PTTEP's HR management system, which are on a par with international standards in terms of recruitment, employee development and corporate-culture formation.

Sustain Business Integrity Excellence PTTEP is committed to conducting its business with transparency and effectiveness by adhering to the good corporate governance principles, maintaining robust risk management and internal control system as well as strictly conforming to applicable laws and regulations to assure stable and sustainable growth of the company. In 2021, although it was still a very challenging year due to the severe COVID-19 pandemic and the unrest situations in the countries where PTTEP has invested, PTTEP remains committed and adhered to carry out works as planned. The main progress of works within 2021 are as follows:

- Implemented GRC according to GRC Strategies – Smart Assurance and GRC in Common Sense which aims to effectively integrate assurance processes, cultivate GRC in employee mindset to be aware, accept and implement GRC, as well as prepare for becoming a GRC role model among Thai Listed Companies.
- Conducted an Internal Maturity Assessment for Malaysia Assets to take the results to improve GRC plans more effectively and prepare for a Company-wide GRC Maturity Level assessment program.
- Enhancing Risk Management System which covers suggesting risk, searching risk information and linking risk reporting to other assurance reports with an aim of no unidentified high-impact risks (no surprise risk), expected to complete in 2022.
- Studied on possibility to align and integrate assurance activities to reduce process redundancy

- Continue building GRC culture to increase awareness, understanding and implementation through communication campaign such as promotional materials in the format of VDO Clips, games, and sharing experiences including conducted a post survey to measure employee's understanding and awareness after participating GRC activities throughout the year to plan for GRC communication in next year.
- Conducted Stakeholders Engagement Survey and take the results to develop improvement plan for becoming a GRC role model among Thai Listed Companies

Furthermore, PTTEP has established its Human Rights Policy and Management System in line with the international best practices to ensure concrete implementation and prevention of Human Rights violation through its business operations. The Company also conducted annual Human Rights Risk Assessment. In 2021, the risk assessment covers 100% of its operating assets, non-operated joint ventures, and Tier 1 suppliers. Human Rights e-Learning in online platform was also provided to all employees. Additionally, PTTEP received the 2021 Role Model Organization on Human Rights in the state enterprise category from the Department of Rights and Liberties Protection, Ministry of Justice for the third consecutive year.

PTTEP's strong commitment and concrete performance has made PTTEP recognized by both domestic and international institutions. This can be seen from the awards PTTEP received in 2021 such as the NACC Integrity Awards for the fourth time and the 2 awards from 16th ASIAN ESG Award 2021 – The Best of Asia by Corporate Governance Asia in Hongkong; Asia's Icon on Corporate Governance for the 9th consecutive year and Asian Corporate Director Recognition Award given to Mr. Phongstorn Thavisin, PTTEP's former Chief Executive Officer. PTTEP also received 5 awards from The Asset ESG Corporate Awards 2021 and The Asset Best CEO Award by The Asset. PTTEP also earned an Excellent level and received five symbols of recognition, which is the highest level, from the Corporate Governance Report of Thai Listed Companies 2021 (CGR 2021) and received a certificate of Thai Private Sector Collective Action Against Corruption (CAC) in the announcement at the end of Q4/2021. Moreover, the Dow Jones Sustainability Indices (DJSI) score on PTTEP's Risk and Crisis Management topic was achieved the best industry score for the 2nd consecutive year. Such recognitions are our pride, and it will motivate PTTEP to carry out its business with efficiency, transparency, accountability as well as conscious care for all stakeholders to achieve our vision of becoming the "Energy Partner of Choice".

Optimize Resource & Create Shared Value PTTEP concerns for natural resource conservation, environmental restoration as well as community and social development. Our strategies and main progress in 2021 are as follows:

- **Circular Model for E&P Strategy:** PTTEP's work processes were redesigned, and resources were reused and recycled. The target is to reuse at least 50% of main structures which are retained at appropriate, safe, and efficient conditions by 2030. In 2021, PTTEP has completely launched PTTEP Circular Economy Guideline and Reuse Guideline for PTTEP Existing Facilities. The Company also completed the first topside reuse at Arthit Asset in August and our onshore operations continue the achievement of 100% Mobile Production Facility Reuse. In addition, in 2021, our hazardous waste to landfill is reported at zero in line with our long-term target for zero waste to landfill by 2030.
- **Ocean for Life Strategy:** PTTEP, whose operations are mostly offshore, aims to be a leader in conserving restoring and monitoring natural resources and marine ecosystems (Guardian of the Ocean) to support economic growth and quality of life of nearshore communities, with the target to achieve Net Positive Impact of Ocean Biodiversity and Ecosystem Services (Ocean BES) value in domestic offshore operations by 2025 and all offshore operations by 2030, compared to the 2019 base year. The Company also set the target to Increase 50% of community income for focused communities and achieve 16,000 conservation networks by 2030, compared to the baseline data before PTTEP project implementation. In 2021, PTTEP achieved Net Positive Impact on Ocean BES value at 29.5% in domestic offshore operations from Coastal Conservation Area and Fish Home Project, Mangrove Forestation Project and H.T.M.S Under Water Learning Site Project. The Company has also completed the Baseline Study of Microplastics Project in the Gulf of Thailand with Kasetsart University and there is a plan to continuously conduct the study in every 3 years. In addition, PTTEP achieved 1,000 rais mangrove plantation in Nakhon Sri Thammarat province.

Furthermore, PTTEP also carries out research and development (R&D) projects such as the Greenhouse Gas (GHG) reduction by converting Carbon Dioxide to Propylene Carbonate, converting flare gas and Carbon Dioxide to Carbon Nanotube, the waste reduction by utilizing drill cutting as material for road pavement and converting the produced sand to high value products, the green buoy for underwater condition monitoring and the microplastics sensor development project. These projects are currently under research and development.

In Q4/2021, PTTEP received 3 awards from the 12th Asia Best CSR Practices Awards 2021, which consist of Best Environment Friendly Project from the forest restoration for Eco-learning at Sri Nakhon Khuean Khan Park project, Community Development Project from the waste-to-energy project, and Concern for Health from the community health development program. PTTEP additionally received 3 awards from the Global CSR Awards 2021, an annual regional competition for the companies with a market capitalization of more than 1 billion Baht. PTTEP won the Gold CSR Leadership Award, Gold Best Community Program Award and Bronze Best Environmental Excellence Award. All recognitions represent the company's outstanding social responsibility, as well as a strong emphasis on the technological applications to improve operational efficiency, mitigation of environmental impacts and continuously strengthening country's energy security.



Future Business Outlook

Energy Outlook

The COVID-19 pandemic and subsequent economic downturn has caused a slump in global energy consumption. Oil-based transportation has been the most affected, and in a less magnitude for gas and renewables. In 2021, global energy demand still relies primarily on fossil fuels such as crude oil, natural gas and coal. It is forecasted that fossil fuels' consumption and its dominance will be less significant in the long run. However, during the energy transition period, natural gas and LNG demand will play key role as global economy recovers and expands especially in the power generation sector stemming from the national energy policies of various key growth countries, transforming to natural gas, which is cleaner energy. Crude oil consumption continues to slowly grow and eventually plateau by 2040, mainly from petrochemical, trade, and goods transportation sectors, partially offset by efficiency gains and alternative transport fuels. Moreover, in the short term, the renewable energy sector tends to suffer from the COVID-19 pandemic due to the lack of governments budget to provide support and supply chain bottleneck. However, in the longer term, demand in the renewable energy will eventually recovers, particularly for solar and wind as support for environmental and climate policies and targets in CO₂ and greenhouse gas (GHG) reduction by several countries globally.

For Thailand, the Government has increased Nationally determined contributions (NDC) to reduce GHG emission reduction by 40% in 2030 to reach carbon neutrality in 2050 and Net Zero GHG emission by 2065 by promoting renewable energy investment such as sourcing 50% of country's power generation from renewable sources and promoting electric vehicle usage to 30% in 2030.

Oil Price Outlook

As COVID-19 Omicron and Delta variants spread at the end of 2021, it potentially has an impact to oil market in 2022. While the vaccination might help at the certain level, the immunity also varied depend on vaccine type and booster shot programs. Europe in particularly has experienced both high caseloads and high ICU occupancies, therefore partial lockdown is implemented across countries until at least March 2022. The negative demand impact for Q1/2022 is estimated to decrease at approximately 230,000 barrels per day. Overall demand in 2022, however, shall be recovered to pre-COVID level at 100 million barrels per day.

On the supply side, OPEC+ production target is expected to maintain at 400,000 barrels per day incremental each month until September 2022 with flexibility to change course based on oil demand situation. However, due to Russia's lower production performance and lack of E&P investment in the past few years by many countries, it is likely that the actual production will be less than target by 1-2 million barrels per day in 2022. Moreover, it is expected that sanctions to Iran could be lifted in Q2/2022 if the nuclear deal negotiation goes well which will subsequently raise Iran's crude production from 2.5 to 3.4 million barrels per day. U.S. oil production is also forecasted to grow structurally from Q2/2022 toward 13 million barrels per day amid updated corporates spending plan, continued rising oil rig count and strong fracking activities.

Based on demand and supply outlook, crude oil market will continue to rebalance throughout 2022. The average Dubai crude price is expected to be varied around 65-85 USD per barrel in 2022 depend on various factors. The key factors which need to be monitored are summarized as per following; COVID-19 situation, lockdown measure, vaccination progress, harsh weather, demand recovery, Fed interest rate and QE policy, oil supply levels of main producing countries (OPEC, Russia, and U.S.), sanction policy to Iran as well as SPR drawdown policies.

LNG Market

The oversupply situation of Global LNG market is expected to prolong throughout 2022, with total production capacity of existing and upcoming LNG projects growing by 27 MTPA to 422 MTPA from 2021 (approximately 7%), while demand for LNG is anticipated to be around 399 MTPA (Source: FGE as of December 2021). The crude oil prices in the world market are likely to fluctuate in 2022, which could affect LNG price. LNG demand tends to increase as a result of LNG market liberalization that drive the demand in several Asian countries. Moreover, a decline in domestic gas production in many countries would cause more demand for LNG import. The average 2022 Asian Spot LNG price is expected to be around 16 USD per MMBTU (Source: FGE as of January 2022).

Environmental, Social and Governance (ESG)

The Environmental, Social and Governance (ESG) is a challenging issue that companies have to find effective management methods as it directly affects the sustainability of the organization and in turns, profitability, competitiveness and reputation. Therefore, the organization has to focus on ESG risks and integrate them into the organization's management which includes formulating vision and strategy as well as risk management, in order to build confidence among all stakeholders.

PTTEP has completed the materiality assessment to identify the key material issues to the business in the stakeholders' perspectives, in order to support the management of ESG risk which consists of 8 materiality issues in 2021; including 1) Governance, Risk Management and Compliance 2) Increasing Petroleum Reserves 3) Human Resource Preparation 4) Technology and Innovation 5) Occupational Health and Safety 6) Contribution to Communities and Society 7) Lower Carbon Future 8) Environmental Management. PTTEP has developed sustainability strategy to address these issues under PTTEP's Sustainable Development Framework. The framework comprises of three main components namely: High Performance Organization (HPO), Governance, Risk Management and Compliance (GRC), and Stakeholder Value Creation (SVC). The balance of these three components will support PTTEP's journey towards sustainability, please refer to "Strategies under Sustainable Development Framework" for more details.

Thai Economy and Foreign Exchange Outlook

The Bank of Thailand expects the economy to expand at 3.4 percent in 2022 as recovery of economic activities continues and more foreign tourists were permitted to enter Thailand. The forecast is down from the previous 3.9 percent mainly due to the uncertainty around the emergent Omicron variant muting recovery expectations. As vaccination rates improve however, risks to Thailand's growth outlook will also become more balanced as the need to reimpose strict containment measures is reduced. On the policy front, Bank of Thailand expects to support policies that provide accommodative financial conditions and does not impede economic recovery.

In 2022, the Thai Baht is expected to be volatile due to QE tapering of the US Federal Reserve. However, the expected general recovery as Thailand continues to reopen and economic activities continue to improve puts the Thai Baht on an appreciating trend for 2022. Important factors to the Thai Baht are the efficacy of Covid-19 containment in 2022, BOT monetary policy decision which is expected to continue to be accommodative relative to the Federal Reserve, and continued government policy support for the Thai economy.

PTTEP has adopted the natural hedge method to manage FX risks of revenues from petroleum products and major expenses which are in the same currency. Remaining FX risk exposures from non-USD revenues and expenses are managed by utilizing financial hedging instruments such as forwards and cross currency swaps. Moreover, interest rate volatility does not materially impact the Company's financial performance as 83 percent of total interest-bearing debt is fixed rate.

Other important factors that affect the Company's operations

Enactment of the Revenue Code Amendment Act (No. 50) B.E. 2562 and the Petroleum Income Tax Amendment (No. 9) B.E. 2562 in April 2019 and relevant regulations in June 2020, which allow tax filing to be done in US Dollar, which is the company's functional currency for the fiscal year starting from 2020. PTTEP group had already recognized the financial impacts of such changes in Q2/2020 and Q3/2020, and there will be no impact from THB/USD fluctuation to the company's financial performance starting from Q4/2020 onward.

PTTEP's performance outlook for the year 2022

PTTEP's performance depends on three major factors including Sales volumes, Gas price and Unit cost with guidance as follows.



Note: 1. The sales volume includes the sales volume from ADNOC Gas Processing (AGP)

2. The assumption is based on average Dubai price in 2022 of 67 USD/Barrel

3. Including Oman Block 61 performance which PTTEP has acquired 20% interest, with Completion Date on March 23, 2021.

4. EBITDA margin: A percentage of Earnings before interest, taxes, depreciation, and amortization to the Sales Revenues and Revenue from pipeline transportation

Sales volume:

PTTEP expects the average sales volume for the first quarter and full year of 2022 to be approximately 436,000 and 467,000 barrels of oil equivalent per day respectively. The sales volume growth in 2022, compared to the previous year was mainly driven from the first full year realization of sales volume from Malaysia Block H and Oman Block 61 Project, including G1/61 and Algeria Hassi Bir Rekaiz Project which the first production is planned in early 2022.

Sales price:

- PTTEP's liquid prices will fluctuate according to global crude prices.
- PTTEP's gas price formulas are partially linked to oil prices with reference to average historical prices ranging from the past 6 to 24 months. The average gas price for the first quarter and full year of 2021 is estimated at approximately 6.0 and 5.9 USD/MMBTU respectively, higher than the previous year, reflecting the lag time adjustment of gas price in accordance with a sharp increase in global crude price last year.
- Outstanding volume of oil price hedging for 2022, as at the end of 2021, was approximately 15 million barrels. The Company has consistently monitored crude oil price movements and has the flexibility to adjust its hedging plan as appropriate.

Unit Cost:

For the first quarter and full year of 2021, PTTEP expects to be able to maintain unit cost at around 27-28 USD/BOE, lower from the previous year from effective cost management, coupled with the first full year realization of sales volume from Malaysia Block H and Oman Block 61 Project, as well as the start-up of G1/61 and G2/61 projects in 2022, of which the unit costs for these projects are quite low.