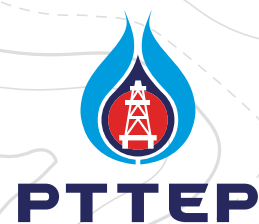


56-1 One Report
Annual Report
2021

PTT Exploration and Production Public Company Limited





**Over 3 decades
of energy exploration
on the journey to secure a sustainable
energy supply**

PTTEP is conscious of the responsibility to explore and produce petroleum and to provide a sustainable petroleum supply to Thailand and the countries where we operate. PTTEP aspires to achieve balanced growth and the need to prepare for Energy Transition.

In pursuit of attaining these goals PTTEP has leveraged our expertise under the **Coming Home Strategy** which focuses our investment on 5 strategic countries.

Furthermore we are exploring investment opportunities in future energy, Artificial Intelligence (AI) and robotics.

... to ensure continued success and a sustainable future



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For cases where this Annual Report (Form 56-1 One Report) references information disclosed on the Company's website the disclosed information shall be deemed to be part of Form 56-1 One Report. The Board of Directors certifies the correctness and completeness of such disclosed information which is the same as information disclosed in Form 56-1 One Report.

Social and Environmental Contribution Highlights

Social support

43,772 million THB

Paid to Thai Government in form of income tax, royalties, production bonus and other remuneration



R&D funds



Student scholarships



School improvements



Increase local community income and charity

Environmental support



CO₂ emission reduction from operations

358,187 tCO₂eq

2020

Zero Hazardous waste to landfill

2025

Zero Industrial waste to landfill

2030

Zero waste to landfill

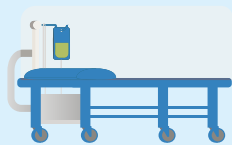


Moving forward to zero industrial waste to landfill



Ocean waste reduction, Net Positive impact of Biodiversity and Ecosystem Services

COVID-19 support Local & International



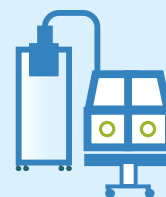
x **18**

Negative pressure transfer beds



x **6**

Negative pressure wheelchairs



x **139**

Oxygen High Flows



x **1,000**

IoT cold chain monitoring alert system for COVID-19 vaccine storages



x **10**

CARA Medical Supplies and Food Delivery Robots



x **3**

Xterlizer UV Disinfection Robots



x **36,000**

PTTEP Care Boxes (Home Isolation Kits)



30 million THB

Financial support to the ongoing Chula-Baiya COVID-19 vaccine development



Other necessary supplies and funds



◀ Negative pressure transfer beds



Negative pressure ▶
Wheelchairs



▲ Xterlizer
UV Disinfection
Robots



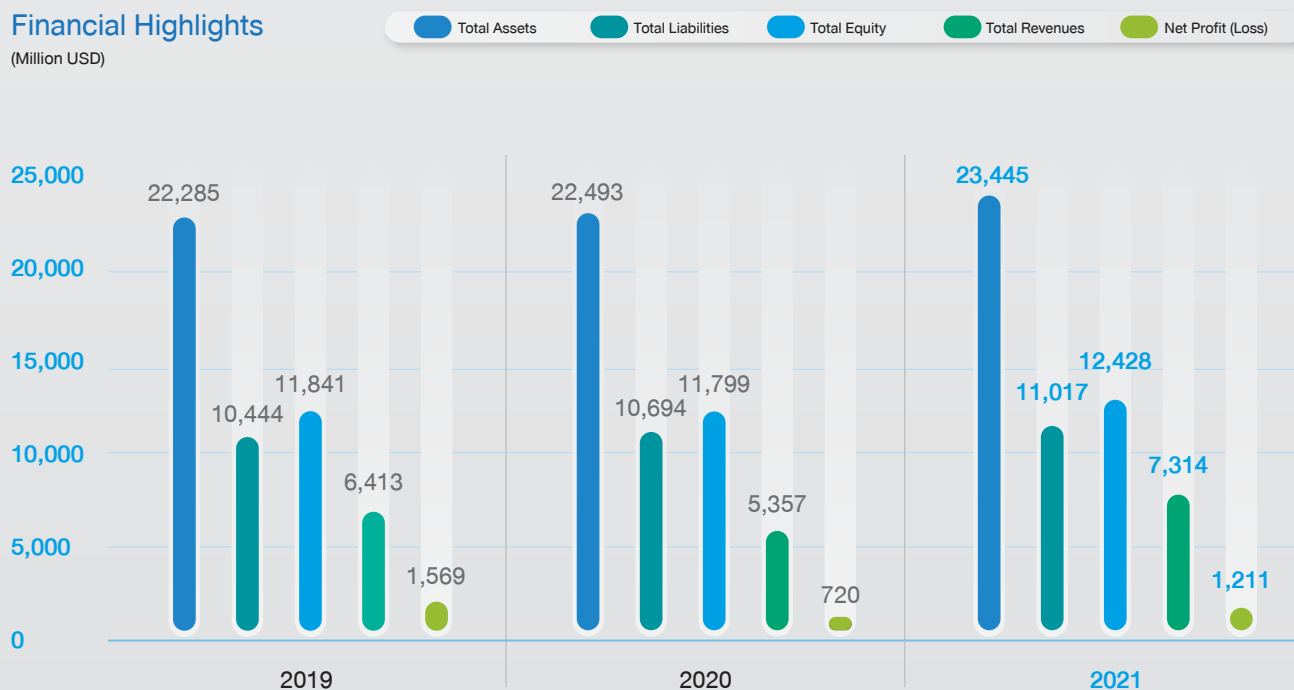
CARA ▶
Medical Supplies and
Food Delivery Robots



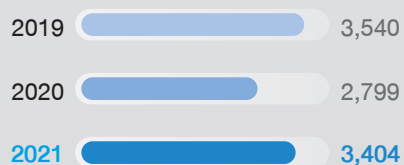
Financial Highlights

Financial Highlights

(Million USD)



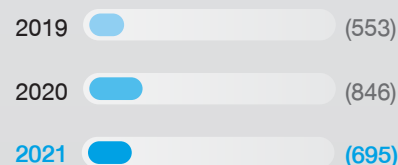
Net Cash from Operating Activities*



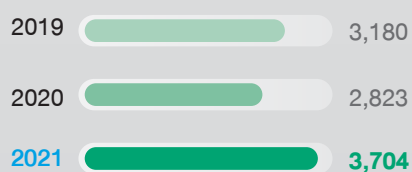
Net Cash Used in Investing Activities



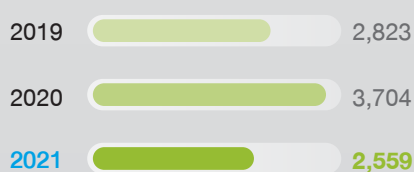
Net Cash Used in Financing Activities



Cash and Cash Equivalents at the Beginning of the Year**



Cash and Cash Equivalents at the End of the Year**



(Million USD)

* Including impact of exchange rate changes

** Excluding short term investment

	2019	2020	2021
Dividend per Share (THB)	6.00	4.25	5.00*
Dividend Yield (%)**	4.82	4.33	4.24

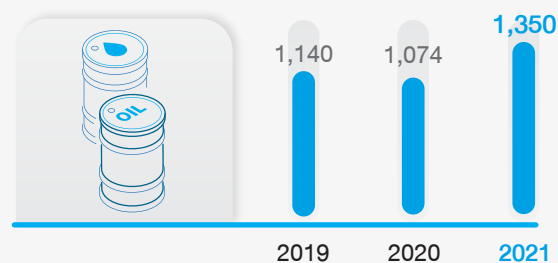
* Total dividends of 2021 at the rate of THB 5.00 per share include the interim dividend at the rate of THB 2.00 per share and the second half-year operations dividend at the rate of THB 3.00 per share. Payments of the interim dividend and the second half-year operations dividend will be proposed in the 2022 General Shareholder's Meeting on March 28, 2022 for acknowledgement and approval, respectively.

** Calculated from PTTEP's closing share price on period end

	2019	2020	2021
Financial Ratios			
EBITDA Margin (%)	71	68	73
Debt to Equity (times)	0.29	0.33	0.33
Return on Equity (%)	13	6	10
Return on Assets (%)	8	3	5
Return on Capital Employed (ROCE)	11.35	5.37	8.15

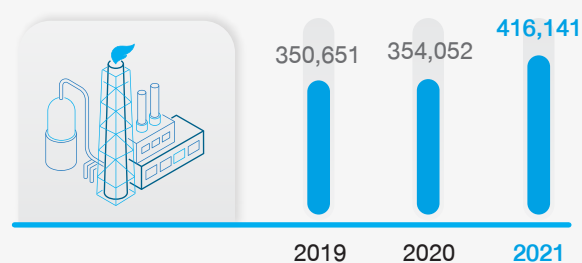
Petroleum Proved Reserves

(MMBOE)



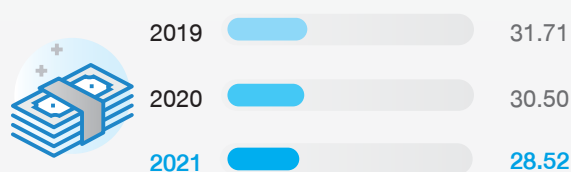
Petroleum and Natural Gas Sales Volume

(BOED)



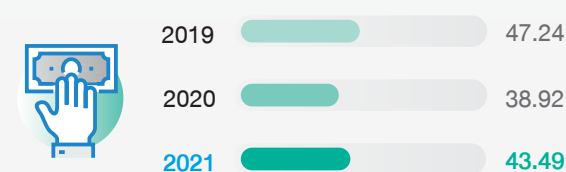
Unit Cost

(USD per BOE)



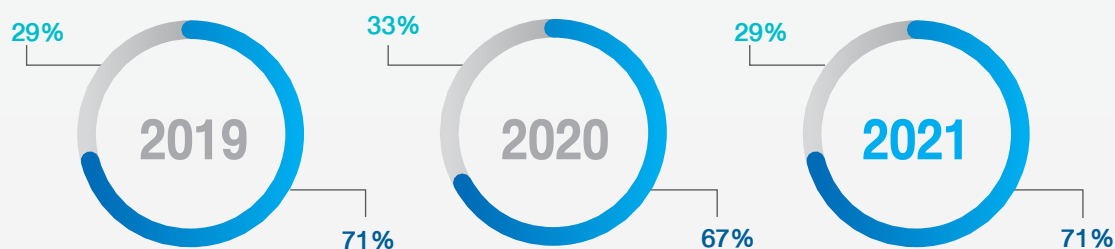
Average Sales Price

(USD per BOE)



Natural Gas to Liquid Ratio for Sales Volume

■ Natural Gas
 ■ Liquid



Message from Chairman and Chief Executive Officer



A handwritten signature in black ink, consisting of stylized initials and a surname.

Mr. Krairit Euchukanonchai
Chairman

A handwritten signature in black ink, featuring a long horizontal stroke followed by a stylized name.

Mr. Montri Rawanchaikul
Chief Executive Officer

Dear Shareholders,

Throughout the year 2021, the coronavirus (COVID-19) pandemic remained a grave challenge in all countries, prompting the mobilization of massive resources for the fight against the disease. In this fight, PTT Exploration and Production Public Company Limited (PTTEP) stood side by side with all Thais and people in the countries where we operate. PTTEP and AI & Robotics Ventures Company Limited (ARV), our subsidiary, collaborated with partners in creating innovations in support of medical professionals with our knowledge and expertise. These innovations are negative pressure patient transfers and mobile negative pressure boxes, cold chain sets to monitor temperature and control the cold chain of COVID-19 vaccine storage, CARA Robot for the delivery of medical and food supplies and Xterlizer that can eradicate diseases with UV-C light. On top of that, PTTEP allocated a budget to support the development of Thai vaccine, “Chula-Baiya”, which is expected to be ready in 2022. We also provided financial support and medical equipment to hospitals in Thailand and abroad, education institutes, and a number of organizations.

The development of vaccines and accelerated roll out across the globe, helped lift oil demand in the fourth quarter. Nevertheless, the world must remain vigilant as it continues to encounter new COVID-19 viral mutations and another wave of infections. Aside, the energy industry which includes the petroleum exploration and production business continues to face major challenges, ranging from the energy transition to cleaner energy, to the aspiration to reduce greenhouse gas emissions and achieve a low-carbon economy. In these circumstances, despite these external factors, PTTEP still succeeded in achieving our operational and financial targets.

Firm on the Execute and Expand Path

PTTEP remains committed to following through the Execute and Expand strategies in growing the petroleum

exploration and production business, which is our core business. We have put an emphasis on maintaining our competitiveness by controlling unit costs and creating added value from existing projects. For natural gas projects in Thailand, PTTEP has signed the contract and relevant obligations concerning access to G1/61 Project or Erawan Field with the current concessionaire 2 years behind schedule. All involved processes to become the project operator have been accelerated, to ensure smooth and safe production and minimize impacts on gas production as much as possible. In Malaysia, PTTEP started producing gas from H Block and made a success in the drilling of 4 exploration wells in 2021. We accelerated plans to make sure that our projects overseas would achieve start-up targets. That covered Algeria Hassi Bir Rekaiz Project in Algeria, Domestic Gas to Power Project in Myanmar, and Mozambique Area 1 in Mozambique.

We maintain our focus to expand business in strategic areas where we are proficient in, those areas are Southeast Asia and the Middle East. We are exploring new investment opportunities by teaming up with experienced partners. In 2021, PTTEP acquired participating interest in Block 61 in Oman that immediately increased sales volumes and joined the onshore exploration in Area C, the United Arab Emirates.

The success in the Execute and Expand strategies boosted the Company's production output to a record high in 2021, at approximately 490,000 barrels of equivalent oil per day.

Meanwhile, PTTEP pursues investments in non-E&P business (Beyond E&P) for the Company's long-term growth. In 2021, PTTEP established 3 subsidiaries for investment in electricity generation and renewable energy while ARV set up 4 subsidiaries to support expansion of the service business in underwater surveys, inspections, and maintenance; infrastructure inspection for industrial customers; smart agriculture and sustainable forest

management; and health data network. In preparation for future changes, the PTTEP Technology and Innovation Center (PTIC) was inaugurated in support of the development of research-based innovation and prototype technology. In the past year, we issued a PTTEP digital bond to the general public in collaboration with Krung Thai Bank, to raise working capital. The bonds were sold via the bank's "Pao Tang" application, making it the first offering through an electronic wallet in Asia. The 6 billion Baht issue was overwhelmingly welcomed, fully subscribed within 8 minutes.

2021 Performance

With the above achievements, PTTEP, as a result, had recorded a better financial performance in 2021, compared to the previous year. The average sales volume stood at 416,141 barrels of oil equivalent per day (BOED), an 18% rise from 354,052 BOED in 2020, while the average selling price was adjusted upward due to the increase in global crude oil price. As a consequence, the Company generated total revenue of USD 7,314 million (equivalent to THB 234,631 million), increasing by 37% compared to USD 5,357 million (equivalent to THB 167,418 million) reported in 2020.

However, in 2021, the Company recorded extraordinary expenses including impairment losses, primarily from development plan adjustment of the Mozambique Area 1 project due to ongoing political unrest in the country, and the recognition of oil price hedging losses.

According to the aforementioned factors, PTTEP's net profit in 2021 reported at USD 1,211 million (equivalent to THB 38,864 million), an increase of 68% from USD 720 million (equivalent to THB 22,664 million) in 2020. The unit cost was able to be maintained at USD 28.52 per BOE and Earnings before Interest, Taxes, Depreciation, and Amortization (EBITDA) margin stood at 73%, aligned with the Company's target.

As of year-end 2021, PTTEP reported total assets of 23,445 MMUSD, of which 2,559 MMUSD was cash on hand with debt-to-equity ratio at 0.33, reflecting strong and healthy financial structure.

"Energy New Normal" in Light of Energy Transition

In preparation for digital challenges and energy transition, PTTEP envisages itself as a "Cautious Diversified Player" that leverages its strengths in exploration and production in nurturing energy security and pursuing investment opportunities in future energy for sustainable growth. Under the "Energy New Normal" concept, we will:

1. **Strengthen the core business:** PTTEP will continue with the Execute and Expand and Coming Home strategies, with a focus on Southeast Asia and the Middle East where we have a strong foothold, to create added value from existing projects. We will emphasize an increase in output from principal projects and push overseas projects towards the scheduled start-up dates, under the goal to become the largest natural gas producer in Southeast Asia.
2. **Diversify into new businesses:** PTTEP will explore investment opportunities in new businesses that promise long-term growth, which are technology and innovation. We set the target to enhance our commercial service capability and readiness concerning electricity generation business, both in the forms of gas-fired power plants (Gas to Power) and LNG-fired power plants (LNG to Power), as well as advanced renewable energy business.
3. **Explore future energy:** PTTEP will explore future energy. In focus are Carbon Capture, Utilization, and Storage (CCUS) technology to reduce greenhouse gas emissions; and hydrogen which is under a study of commercial feasibility, to turn it into an upstream energy business.

Meanwhile, PTTEP aims to be an agile organization that ably integrates digital technology with knowledge. The goal is to create a corporate culture that prepares the organization for the transition to New Normal. Transformation programmes have been launched under the "One Team, One Goal" concept, to enhance internal capability and improve work processes for the post-COVID-19 world that requires flexibility and long-term work efficiency.

Moving Towards Zero Greenhouse Gas Emissions (Net Zero)

Climate change has affected the global environment in many ways. As a leading exploration and production company aiming to be a global player that ensures energy security and sustainable values to stakeholders, in anticipation of these challenges PTTEP has prepared certain key targets. PTTEP will raise the ratio of investment in natural gas, clean energy, to about 80% and explore solutions that reduce greenhouse gas emissions. Under our goal to become a low-carbon organization, we have set a target to reduce greenhouse gas emission intensity by 25% by 2030. In 2021, the intensity of greenhouse gases was reduced by 24.1% through the recycling and reuse of flare gas in the production process, efficient energy consumption, and continuous improvement in production efficiency. Additionally, as mentioned before a feasibility study on Carbon Capture Storage Project for projects in the Gulf of Thailand and Malaysia has begun.

These efforts will pave the way for our important goal, to achieve net-zero emissions. The goal will support Thailand's Nationally Determined Contribution (NDC) commitment under the Paris Agreement and its commitment to the 26th session of the United Nations Framework Convention on Climate Change (COP26). Under these commitments, Thailand has outlined the Long-Term Low Greenhouse Gas Emission Development Strategy.

Concerned About Environment, Society and Governance (ESG) on the Path Towards Sustainability

In alignment with our vision as the Energy Partner of Choice, PTTEP places an emphasis on operating business with concerns in the environmental, social, and governance aspects (ESG). The Sustainable Development Framework was shaped around the United Nations Sustainable Development Goals and served as operational guidelines. The Framework highlights 3 major components: 1) High Performance Organization (HPO) 2) Governance, Risk Management and Compliance (GRC) and 3) Stakeholder Value Creation (SVC). PTTEP believes that impressive performance and concerns about stakeholders' shared benefits will allow the Company to achieve energy security and deliver values and sustainability in economic, social,

and environmental dimensions to society at large (From We to World).

Thanks to the adherence to the Sustainable Development Framework, in 2021 PTTEP won numerous awards and recognitions from national and international agencies. For instance, PTTEP was selected as a member of Dow Jones Sustainability Indices (DJSI) - World Oil and Gas Upstream & Integrated Industry for the 8th consecutive year, FTSE4Good Index Series for the 6th consecutive year and included in the Thailand Sustainability Investment (THSI). Other awards and recognitions included Best Sustainability Awards at the SET Awards 2021; ASIAN ESG Awards; recognition as "ESG Influencer; Thailand Innovative Knowledge Enterprise Award 2021 (MIKE Award); certified membership of Thai Private Sector Collective Action Against Corruption; Asian Excellence Award 2021; and numerous awards for social projects from global stages. All mirror PTTEP's commitment to adhere to governance practices, with concerns about stakeholders and its responsibilities for society and the environment.

On behalf of PTTEP's Board of Directors, the Management and employees, I would like to thank our shareholders, suppliers, business partners, financial institutions, public and private organizations, and all stakeholders for their continuous trust and support. We vow to hold on to our emphasis on operating with ESG in mind, for the energy security of Thailand and the countries we operate in and sustainable values for all stakeholders.

In preparation for digital challenges and the energy transition, PTTEP envisages itself as a "Cautious Diversified Player" that leverages its strengths in exploration and production in nurturing energy security and **pursuing investment opportunities in future energy for sustainable growth under the "Energy New Normal" concept.**

The image shows a perspective view of a walkway on an offshore oil rig. The walkway has a yellow and black striped safety pattern and leads towards a complex of industrial structures in the distance. A circular inset in the upper center provides a closer view of the rig's equipment. The scene is set against a clear blue sky and the ocean. A semi-transparent blue circle is overlaid on the right side of the image.

Structure and Business Operations

1. Structure and Business Operations

1.1 Policy and Business Operation Overview

1.1.1 Vision, Mission, Objective, and Strategy

PTTEP is Thailand's leading E&P company with the mission to sustainably explore, secure resources, and produce domestically and around the globe. The Company operates under the sustainable development philosophy, generating continuous business growth with an emphasis on the integrated natural gas business. This includes investment in cleaner energy and technology-related businesses, maintaining a competitive edge in the petroleum exploration and production business through operational efficiency enhancement and continuous innovation development, as well as creating value for stakeholders through good operating performance and being responsible for the community, society, and environment. The statements of PTTEP's Vision, Mission, Objective, and Strategy are defined as below:

Vision: Energy Partner of Choice through Competitive Performance and Innovation for Long-term Value Creation

Mission: PTTEP operates globally to provide reliable energy supply and sustainable value to all stakeholders

Objective & Target: To create a sustainable E&P business and diversify beyond E&P in response to energy transition and future challenges, aiming to assure strong business performance and robust growth in the long term. PTTEP has set the aspiration goals for 2030 as follows:

- Sustain 5% average production growth (CAGR)
- Maintain the reserves to production ratio (R/P) ≥ 5 years
- Continuously reduce unit cost to achieve target at ≤ 25 US\$/BOE to maintain competitive advantage in E&P business
- Achieve 20% contribution to Net Income from Beyond E&P business
- Reduce Green House Gas Intensity by 25% from 2012 base year
- Assure zero work-related accident

Strategy: PTTEP adheres to the Sustainable Development (SD) Framework corresponding with the global standard and the United Nations practices. By operating on a strong foundation for stakeholders' interests under the concept of From We to World, PTTEP will deliver values and foster sustainability in all dimensions, economy, society, and environment and align with the vision to become the Energy Partner of Choice. The details of the strategies are as follows:

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.

- 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 alliances in the Middle East, i.e. the Sultanate of Oman (Oman) and the United Arab Emirates, (UAE), where it has a low-cost base as an advantage relative to other producing regions.
- Drive LNG Value Chain to focus on the upstream and liquefaction plants, including becoming LNG Shipper and developing LNG capabilities via PTT Global LNG Company Limited (PTTGL).

2) Diversification to Beyond E&P Business Strategy

- Scale up AI & Robotic Venture (ARV) and accelerate products and services to market.
- Explore Power business opportunities for Gas/LNG and renewables in the Socialist Republic of Vietnam (Vietnam) and the Republic of the Union of Myanmar (Myanmar).
- Explore business opportunities in Carbon Capture Utilization and Storage (CCUS) leveraging PTTEP's expertise as well as investments in future energy e.g. Hydrogen.
- Commercialize in-house technology that has been researched and developed to support E&P operations.

3) **Greenhouse Gas Management Strategy** PTTEP commits to managing greenhouse gas to mitigate possible impacts from global warming and climate change through production process improvement and new initiatives, e.g. flare gas recovery and utilization, energy efficiency improvement, production efficiency improvement, Methane gas leakage reduction, application of renewable energy in operations, including the feasibility study of Carbon Capture Utilization and Storage in our offshore operations.

Sustain Business Integrity Excellence

PTTEP is committed to conducting its business with transparency and effectiveness by adhering to good corporate governance principles, maintaining robust risk management and internal control system as well as strictly conforming to applicable laws and regulations. The Company established 2 main strategies, namely "Smart Assurance" and "GRC in Common Sense" which the former of which aims to effectively and concisely integrate assurance processes, while the latter focuses on cultivating GRC in employees' and related stakeholders' mindsets to be aware, accept, and implement GRC in daily operation and key decision making. PTTEP also aims to extend and share the GRC practices to the wider community and society.

For more details of Sustain Business Integrity Excellence, please visit PTTEP Sustainability Report 2021 and PTTEP website at <https://www.pttep.com/en/Sustainabledevelopment.aspx>.

Optimize Resource & Create Shared Value

PTTEP conducts its operations while striving to promote natural resource conservation, environmental restoration as well as community and social development. The 2 main strategies are as follows:

1) **Circular Model for E&P Strategy** PTTEP's work processes are redesigned and resources are reused and recycled.

2) **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 to support economic growth and quality of life of nearshore communities.

For more details of Optimize Resource & Create Shared Value, please visit PTTEP Sustainability Report 2021 and PTTEP website at <https://www.pttep.com/en/Sustainabledevelopment.aspx>.

Procedure to Set the Company's Vision and Mission

PTTEP Board of Directors (Board) reviews and approves the vision and mission of the Company annually, being accompanied generally by the management, through a systematic planning process. The process is started by updating the current business environment and the E&P industry trend and their implications on the Company regarding opportunities and risks. In addition, the Company's investment portfolio is reviewed and assessed on returns and risks to identify the vision, mission, and short-term and long-term strategic directions. These allow the Company to achieve sustainable growth as well as be able to cope with business changes. The management will then develop the Company's work plan, budget, and Key Performance Indicators (KPIs), based on the given strategic directions and policies, to be presented to the Board for approval prior to implementation.

After the Board approves the vision, mission, and corporate strategy, the management will cascade down the approved strategic directions and corporate targets to promote a better understanding among all of the Company's employees. In principle, this will subsequently lead to sub-work plan development and implementation, which are in line with the corporate target, work plan, and core values to achieve the Company's goals at the end. However, the Board also regularly supervises and monitors management's implementation of stated strategic plans in accordance with business directions and strategies. The management is responsible for reporting its performance in comparison to the strategic plans to the Board for acknowledgement on a quarterly basis.

1.1.2 Development and Significant Changes in the past 3 years

Year 2019

On January 12, 2019, PTTEP MENA Limited (PTTEP MENA), a subsidiary of the PTTEP Group, and other partners signed the concession agreement to obtain the exploration and production rights of the exploration blocks Offshore 1 and Offshore 2 located on the northwestern coast of the Emirate of Abu Dhabi, UAE. PTTEP MENA holds 30% participating interests during the exploration period.

On February 15, 2019, PTTEP SP Limited (PTTEP SP), a subsidiary of the PTTEP Group, signed the Share Purchase Agreement (SPA) to acquire 33.8% participating interests in APICO LLC from Tatex Thailand LLC and Tatex Thailand II LLC. The transaction was completed and effective on June 4, 2019, with the PTTEP Group's interest increased to 66.8%.

On February 25, 2019, PTTEP Energy Development Company Limited (PTTEP ED), a subsidiary of the PTTEP Group, entered into the Production Sharing Contract of blocks G1/61 and G2/61. PTTEP ED holds 60% and 100% participating interests, respectively. PTTEP ED is the operator of the 2 blocks.

On February 28, 2019, PTTEP South Asia Limited (PTTEP SA), a subsidiary of the PTTEP Group, obtained the official approval from the Government of Myanmar on the transfer of the participating interests in Myanmar MOGE 3 project from other partners. As a result, its participating interests increased from 75% to 77.5% and PTTEP SA is the operator of the project.

On March 19, 2019, the PTTEP Group, together with SONATRACH (The People's Democratic Republic of Algeria's National Oil and Gas Company) and CNOOC Limited, has started development on Phase 1 of Algeria Hassi Bir Rekaiz Project in Algeria, following the conclusion with partners and its approved development plan by ALNAFT (Agence Nationale pour la Valorisation des Ressources en Hydrocarbures – Regulating body of Hydrocarbon Exploration & Production). The development activities have been commenced in March 2019. The PTTEP Group holds 24.5% participating interest and the other joint venture partners consisting of SONATRACH and CNOOC Limited hold 51% and 24.5%, respectively.

On March 21, 2019, PTTEP HK Offshore Limited (PTTEP HKO), a subsidiary of PTTEP, signed Production Sharing Contracts for exploration and production rights of 2 blocks located in offshore Peninsular Malaysia, which are PM407 and PM415 Projects, which PTTEP HKO holds 55% and 70% participating interests, respectively.

On March 21, 2019, PTTEP HK Offshore Limited, a subsidiary of the PTTEP Group, signed a Share Sale and Purchase Agreement (SSPA) to acquire 100% of Murphy Oil Corporation's ("Murphy") business in Malaysia through the equity in 2 subsidiaries of Murphy, consisting of Murphy Sabah Oil Company Limited and Murphy Sarawak Oil Company Limited. The acquisition was completed and effective on July 10, 2019.

On June 17, 2019, PTTEP HK Holding Limited (PTTEP HK), a subsidiary of the PTTEP Group, signed a Share Purchase Agreement (SPA) to acquire a 100% stake in Partex Holding B.V. (Partex) from Calouste Gulbenkian Foundation. Partex holds 7 projects in 5 countries, primarily as a non-operating partner. The focused areas were Oman and UAE, which are PDO (Block 6), Mukhaizna (Block 53), and Oman LNG Project, as well as the ADNOC Gas Processing (AGP). The acquisition was completed and effective on November 4, 2019.

On June 18, 2019, PTTEP Mozambique Area 1 Limited (PTTEP MZA1), a subsidiary of the PTTEP Group, with 8.5 percent of participating interest in Mozambique Area 1 Project and its partners announced the Final Investment Decision (FID) of the project on the initial 2 onshore liquefaction trains. The project will then advance to the construction phase to develop the Golfinho-Atum natural gas accumulations located in Offshore Area 1, Republic of Mozambique (Mozambique).

On June 27, 2019, PTTEP HK Offshore Limited (Malaysia Branch) or PTTEP HKO, a subsidiary of the PTTEP Group, made a discovery of gas at the Lang Lebah-1RDR2, the first exploration well in Sarawak SK 410B Project located in offshore Sarawak, Malaysia.

On July 31, 2019, PTTEP HK Holding Limited (PTTEP HK), a subsidiary of PTTEP Group, entered into the Share Purchase Agreement (SPA) to acquire an additional 39% stake in APICO LLC from Coastal Energy Company (Khorat) Limited. After the completion of the transaction, the PTTEP Group's stake in this project increased from 66.80% to 80.48%.

On September 26, 2019, PTTEP International Limited (PTTEPI), a subsidiary of the PTTEP Group, submitted a request to terminate and relinquish 100% of the exploration blocks of Myanmar M11 project after fulfillment of the requirements of the Production Sharing Contract. The official approval from the Government of Myanmar was already obtained in November 2021.

Year 2020

On February 19, 2020, PTTEP MENA Limited (PTTEP MENA), a subsidiary of the PTTEP Group, and Total E&P Oman Block 12 B.V., a subsidiary of Total S.A., signed Exploration and Production Sharing Agreement (EPSA) with Oman's Ministry of Oil and Gas (MOG) for the exploration and production rights of Block 12, located onshore in the central part of Oman, with the participating interest for PTTEP MENA Limited at 20% and Total E&P Oman Block 12 B.V. (the Operator) at 80%.

On March 13, 2020, PTTEP Australia Timor Sea Pty Ltd (PTTEP AT), a subsidiary of the PTTEP Group, requested to terminate and return 100% of AC/RL5 Project to the Government of the Commonwealth of Australia (Australia), after fulfillment of the requirements of the concession. The termination is effective from June 15, 2020.

On July 9, 2020, PTTEP South Asia Limited (PTTEP SA), a subsidiary of the PTTEP Group, submitted a request to terminate and return 77.5% of the exploration block of Myanmar MOGE 3 Project after fulfilling the obligations under the Product Sharing Contract. The official approval from the Government of Myanmar was already obtained in November 2021.

On July 21, 2020, AI and Robotics Ventures Company Limited (ARV), a subsidiary of the PTTEP Group, and Thai Advance Innovation Company Limited, a subsidiary of Thaicom Public Company Limited, set up a new joint venture company under the name of ATI Technologies Co., Ltd. in order to develop unmanned aerial vehicle (UAV) or drone solutions, both product and services, and develop smart farming technologies, including data analytics platform and end-to-end farm management solution, to enhance the potential of the agricultural sector in Thailand.

In July 2020, the PTTEP Group and its partners signed senior debt financing agreements in Mozambique Area 1 Project (Project Finance), in the amount of USD 14.9 billion, to advance the first two-train LNG development, after the final investment decision was made in June 2019. The PTTEP Group has 8.5% of the participating interest in this project.

On October 14, 2020, PTTEP South Asia Limited (PTTEP SA), a subsidiary of the PTTEP Group, submitted a request to terminate and return 50% of the exploration block of Myanmar MD-7 Project after fulfilling the obligations under the Product Sharing Contract. The termination will be effective upon receiving official approval from the Government of Myanmar.

On October 27, 2020, AI and Robotics Ventures Company Limited (ARV), a subsidiary of the PTTEP Group, and Mermaid Subsea Services (Thailand) Company Limited, a subsidiary of Mermaid Maritime Public Company Limited, set up a new joint venture company under the name of Zeaquest Co., Ltd. in order to develop AI and robotic technologies to provide underwater inspection, repair, and maintenance services to oil & gas and renewable energy corporates operating in offshore businesses in Asia and globally. The objective of the joint venture is to be an internationally renowned leader in inspection, repair, and maintenance services using AI and robotic technology.

On December 21, 2020, PTTEP MENA Limited (PTTEP MENA), a subsidiary of the PTTEP Group, and Eni Abu Dhabi B.V., a subsidiary of Eni S.p.A. were selected as the successful bidders from the 2019 Abu Dhabi's Block Bid Round for exploration and production rights of Offshore Block 3 which is located in the north-west of Abu Dhabi, UAE. The consortium has

signed a Concession Agreement with the Abu Dhabi National Oil Company (ADNOC), with the participating interest for PTTEP MENA Limited at 30% and Eni Abu Dhabi B.V. (the Operator) at 70%.

On December 30, 2020, the PTTEP Group received an exclusive right to develop the Integrated Domestic Gas to Power Project in Myanmar and signed the Notice to Proceed with the Ministry of Electricity and Energy (MOEE). It is an integrated energy project from Exploration and Production to a gas-fired power plant in Myanmar. At the initial stage, the PTTEP Group plans to feed the natural gas from the Zawtika and Myanmar M3 Project to supply the new power plant with a capacity of 600 megawatts for domestic consumption. The generated power will be sold to the Electric Power Generation Enterprise (EPGE), a state-owned enterprise under MOEE, over a 20-year term with 5-year extension, from the Commercial Operation Date (COD).

Year 2021

On February 6, 2021, PTTEP Sabah Oil Limited (PTTEP SBO), a subsidiary of the PTTEP Group, and its joint venture partners completed the first development phase of Malaysia Block H Project. Natural gas production, at depths greater than 1,100 meters from Rotan and Buluh deepwater fields, had commenced since then, for delivering to PETRONAS Floating Liquefied Natural Gas-2 (PFLNG2) facility. The production target rate is 270 million standard cubic feet per day (MMSCFD).

On February 10, 2021, the PTTEP Group announced the appraisal drilling well result of SK 410B Project, located offshore Sarawak, Malaysia. The appraisal drilling at Lang Lebah-2 followed the gas discovery of the first exploration well, Lang Lebah-1RDR2 in 2019. The appraisal well, Lang Lebah-2, was drilled in September 2020 to a total depth of 4,320 meters with proven over 600 meters of net gas pay discovered, indicating a larger reservoir than the initial estimate. The drilling result registers a new record for the PTTEP Group's largest gas discovery and will increase reserve and support the Company's long-term growth.

On February 24, 2021, the PTTEP Group announced the discovery of gas at the Dokong-1, the first exploration well of Sarawak SK 417 Project, located in offshore Malaysia. At a total depth of 3,810 meters, the well encountered 80 meters of net gas pay, indicating gas discovery. This high-quality gas discovery at Dokong-1 presents future synergy development and production opportunity as a cluster development with the previously discovered adjacent Sarawak SK 410B Project.

On March 19, 2021, the trial judge of the Federal Court of Australia delivered the class action judgment on the Class Action lawsuit against PTTEP Australasia (Ashmore Cartier) Pty Ltd. (PTTEP AAA), a subsidiary of the PTTEP Group, brought by a group of Indonesian seaweed farmers, claiming damages to their seaweed crops caused by the 2009 Montara incident.

On March 23, 2021, the conditions precedent to Completion, as prescribed in the signed Sale and Purchase Agreement (SPA) to acquire 20% interest in Block 61, Oman from BP Exploration (Epsilon) Limited through PTTEP MENA Limited, a subsidiary of the PTTEP Group, were fulfilled. The acquisition was then completed and effective from such date. This transaction was contemplated by the SPA dated February 1, 2021 with a total transaction value of approximately 2,450 million USD. Oman Block 61 Project is a producing onshore gas block situated in the central of Oman.

On March 30, 2021, the PTTEP Group announced the discovery of gas at the Sirung-1, the first exploration well of Sarawak SK 405B Project, located offshore Malaysia. At a total depth of 2,538 meters, the well encountered 100 meters of

significant oil and gas sandstone reservoirs. The appraisal well is scheduled to be drilled in 2022 to further affirm the petroleum potential of the field.

On April 26, 2021, the PTTEP Group announced the Force Majeure declaration, made by TotalEnergies (the operator), to suspend operations of the Mozambique Area 1 Project (LNG project) for safety reason. This was due to the security situation in the city of Palma, Mozambique, situated approximately 20 kilometers from the Project and construction site. All projects' staff and contractors are safe from this situation. The Operator had evacuated all staff and contractors out of the area and handed the Project site to be under the care of the Government of Mozambique.

On May 19, 2021, the PTTEP Group announced the discovery of gas at the Kulintang-1, the first exploration well of Sarawak SK438 Project, located offshore Malaysia. At a total depth of 2,238 meters, the well encountered gas reservoirs. The exploration well is scheduled to be drilled to further affirm the petroleum potential of the field.

On June 16, 2021, AI and Robotics Ventures Company Limited (ARV), a subsidiary of the PTTEP Group, in partnerships with Aerodyne Group (Aerodyne) from Malaysia and Digital Creation Co., Ltd. (DC) announced the launch of a joint venture company AeroSky (Thailand) Company Limited (AeroSky), with 33% shareholding interest by ARV. AeroSky will provide state-of-the-art drone-based enterprise solutions across the Thai market, including clients in the telecoms, electricity, oil & gas, and other infrastructure-led industries. The establishment of this joint venture is in line with the company's strategy of expanding investment into new businesses through the use of technology and innovation to enhance efficiency and create long-term sustainability.

On September 1, 2021, the PTTEP Group, with 24.5% participating interests and is the operator of Algeria Hassi Bir Rekaiz Project in Algeria, received an approval from the Government of Algeria to acquire the 24.5% shareholding interest in the Project from CNOOC Limited (CNOOC), a joint partner. The shareholding interest of the PTTEP Group then increased to 49% from such date. SONATRACH, a national oil company of Algeria, is a partner in this project with 51% participating interest.

On September 3, 2021, Asia Power and Transportation SG Holding Pte. Ltd. was established, with 100% shareholding by EP-Tech Ventures Holding Company Limited (EP-Tech), a subsidiary of the PTTEP Group. This is to support future investments of the PTTEP Group.

On September 6, 2021, Delta Gas Transportation SG Holding Pte. Ltd. was established, with 100% shareholding by Asia Power and Transportation SG Holding Pte. Ltd, a subsidiary of the PTTEP Group. This is to support future investments of the PTTEP Group.

On September 17, 2021, Mitsui Oil Exploration Company Limited (MOECO), a joint partner of Myanmar M3 project, was notified to withdraw its shareholding interest at 20%. The withdrawal was effective on October 31, 2021. As a result, PTTEP International Limited (PTTEPI), a subsidiary of the PTTEP Group, will have the shareholding interest at 100% in this project. However, the completion of the withdrawal is subject to the approval from the Government of Myanmar.

On September 21, 2021, AI and Robotics Ventures Company Limited (ARV), a subsidiary of the PTTEP Group, established four subsidiaries to support its business growth plans, namely Rovula (Thailand) Company Limited (ROVULA), Skyller Solutions Company Limited (SKYLLER), Varuna (Thailand) Company Limited (VARUNA), and Cariva (Thailand) Company

Limited (CARIVA). ROVULA is focused on using advanced artificial intelligence (AI) and robotics to provide end-to-end subsea and marine inspection, repair, and maintenance in the oil and gas industry and beyond. SKYLLER provides integrated asset inspection and management services via its proprietary platform to industrial asset owners by leveraging multiple fleets from drones to robotics and AI platform-as-a-service (PAAS) into unique solutions. VARUNA leverages AI, satellite technology, and unmanned aerial vehicles (UAV) to offer state-of-the-art smart-farming and smart-forestry solutions to farmers and agricultural businesses. CARIVA is a health data network which leverages AI, IoT, and robotics to empower and generate health insights to users, both individuals and businesses.

On September 30, 2021, the PTTEP Group dissolved an inactive subsidiary, namely PTTEP Semai II Limited, in order to reduce administrative costs with no impact to the PTTEP Group's operations.

On October 20, 2021, the PTTEP Group dissolved an inactive subsidiary, namely Cove Energy Mozambique Rovuma Onshore Limited, in order to reduce administrative costs with no impact to the PTTEP Group's operations.

On October 26-27, 2021, the PTTEP Group established 3 subsidiaries to support its future investments, namely FutureTech Energy Ventures Company, FutureTech Solar (Thailand) Company Limited, and Delta Gas Transportation Limited.

On October 29, 2021, the conditions precedent to completion, as prescribed in the signed Sale and Purchase Agreement (SPA) to sell 100% interest in Partex Brasil Ltda. and Partex Brasil Operações Petrolíferas Ltda. were fulfilled. The transaction was then completed and effective from such date. This transaction was contemplated by the SPA dated July 30, 2021, entered into by the sellers, Participations and Explorations Corporation, and Partex (Brazil) Corporation, subsidiaries of PTTEP Group. Partex Brasil Ltda. holds 50% participating interests in the Potiguar Project, an onshore oil field located in the northeast of Brazil.

On November 5, 2021, the PTTEP Group issued name-registered unsubordinated and unsecured digital debentures to the public for the total amount of THB 6,000 million carrying a step-up interest rate of 2.00-2.75% p.a., averaging to 2.25% p.a., with the tenor of 5 years. The debentures were Asia's first fully-digitalized corporate bond via Wallet.

On November 19, 2021, PTTEP Australasia (Ashmore Cartier) Pty Ltd. submitted the request for the relinquishment of AC/L3 Project in Australia, which will be effective after the official approval from the Government of the Commonwealth of Australia.

On November 22, 2021, the Government of Myanmar approved the relinquishment of exploration blocks of Myanmar M11 project, at 100% participating interest, after fulfillment of the requirements of the Production Sharing Contract, that the relinquishment request was submitted in September 2019.

On November 24, 2021, the Government of Myanmar approved the relinquishment of exploration blocks of Myanmar MOGE 3 project, at 77.5% participating interest, after fulfillment of the requirements of the Production Sharing Contract, that the relinquishment request was submitted in July 2020.

On November 30, 2021, the PTTEP Group announced successful gas discovery at the second exploration well, Nangka-1, offshore Sarawak SK 417 Project, in Malaysia. This came after the gas discovery in Dokong Field announced in early 2021. The appraisal well will be drilled to affirm the petroleum potential of the field.

On December 3, 2021, PTTEP MENA Limited, a subsidiary of the PTTEP Group, signed Farm-in/Farm-out Agreement to acquire 25% stake in the Concession Area C onshore the Emirate of Sharjah from Eni Sharjah B.V. Area C is an onshore gas and condensate concession block in the exploration phase, situated in the central part of Sharjah, UAE. The acquisition will be completed after fulfilling all conditions in the said agreement and obtaining all necessary government approvals.

On December 13, 2021, PTTEP Australasia (Ashmore Cartier) Pty Ltd, a subsidiary of the PTTEP Group, exercised its right to appeal and filed a Notice of Appeal in the Federal Court of Australia, against the class action lawsuit brought by a group of Indonesian seaweed farmers, claiming damages to their seaweed crops caused by the 2009 Montara incident. On March 19, 2021, and October 25, 2021, the trial judge of the Federal Court of Australia delivered judgements in the class action and the Final Orders were delivered on November 15, 2021.

1.1.3 Use of Proceeds

As of December 31, 2021, the details of the use of proceeds are as follows:

Domestic Bonds

The funds derived from all baht bonds of PTTEP and PTTEP TC (guaranteed by PTTEP), PTTEP296A, PTTEP226A, and PTTEP12PA, were utilized according to the objectives stated in the indenture and offering documents.

The funds derived from PTTEP26NA of PTTEP, which were issued in November 2021, will be utilized according to the objectives stated in the indenture and offering documents within 2022.

Foreign Bonds

The funds derived from all USD bonds of PTTEP, PTTEP TC (guaranteed by PTTEP), and PTTEP CIF (guaranteed by PTTEP), USD 490 million Bond issued in 2012, USD 650 million Bond issued in 2019, USD 350 million Bond issued in 2020, and USD 500 million Bond issued in 2020, were utilized according to the objectives stated in the indenture and offering documents.

1.1.4 PTT's Obligations according to Bond Issuance

-None-

1.2 Nature of Business Operation

1.2.1 Revenue Structure

PTTEP and its subsidiaries' revenues are mainly from sales of petroleum products of which its price is marked to the world fuel price in US Dollar. Thus, PTTEP and its subsidiaries' revenue structure of 2019-2021 were presented in US Dollar in order to reflect the Company's revenue structure for the petroleum exploration and production projects in the production

phase of PTTEP and its subsidiaries as of December 31, 2021, as the following projects: Bongkot, Contract 4, Arthit, S1, MTJDA, B8/32 & 9A, Contract 3, Sinphuhorm, L53/43 & L54/43, G4/43, E5, PTTEP1, G4/48, L22/43, Zawtika, Yadana, Vietnam 16-1, Natuna Sea A, Yetagun, Algeria 433a & 416b, Vietnam 9-2, Malaysia, Oman Block 61, PDO (Block 6), Mukhaizna (Block 53) and Dunga projects.

In addition, PTTEP and its subsidiaries recorded revenues proportionately from gas pipeline transportation which are Moattama Gas Transportation Company (MGTC), Taninthayi Pipeline Company LLC (TPC), and Andaman Transportation Limited (ATL).

Revenue Structure of PTTEP and Our Subsidiaries during 2019-2021¹

Product	Operated by	% of shares held by the Company	2019		2020		2021	
			Revenue (Million US Dollar)	%	Revenue (Million US Dollar)	%	Revenue (Million US Dollar)	%
Revenue from sales								
Crude oil	PTTEP	-	186.00	2.89	118.59	2.20	167.25	2.28
	PTTEPI	100	57.99	0.90	31.62	0.59	37.60	0.51
	PTTEPS	100	493.93	7.69	314.93	5.83	458.91	6.26
	Orange	53.9496	84.97	1.32	47.86	0.89	61.10	0.83
	B8/32 Partners	25.0009	39.38	0.61	22.18	0.41	28.31	0.39
	PTTEP HV	100	26.73	0.42	15.92	0.29	22.75	0.31
	PTTEP HL	100	107.84	1.68	58.23	1.08	89.50	1.22
	Natuna	50	2.73	0.04	2.84	0.05	3.36	0.05
	PTTEP AG	100	66.79	1.04	43.28	0.80	57.69	0.79
	PTTEP SBO	100	163.24	2.54	203.90	3.78	316.58	4.32
	PTTEP SKO	100	114.90	1.79	128.96	2.39	103.01	1.41
	POC	100	47.28	0.73	199.27	3.69	321.27	4.38
	PKC	100	5.67	0.09	26.04	0.48	47.19	0.64
	PBL ¹	-	0.40	0.01	1.38	0.03	2.12	0.03
Natural gas	PTTEP	-	2,332.17	36.30	2,039.58	37.78	2,164.90	29.54
	PTTEPI	100	1,038.44	16.16	876.10	16.23	822.23	11.22
	PTTEPS	100	41.22	0.64	31.53	0.58	38.50	0.53
	Orange	53.9496	21.38	0.33	12.89	0.24	11.98	0.16

¹ On July 30, 2021, Participations and Explorations Corporation (PEC) and Partex (Brazil) Corporation (PBC), subsidiaries of the PTTEP Group, entered into a Sale and Purchase Agreement (SPA) to sell all shares of Partex Brasil Ltda. (PBL) which is registered in the Federative Republic of Brazil to Ubuntu Engenharia e Serviços Ltda. (Ubuntu). The sale was completed on October 29, 2021.

Product	Operated by	% of shares held by the Company	2019		2020		2021	
			Revenue (Million US Dollar)	%	Revenue (Million US Dollar)	%	Revenue (Million US Dollar)	%
Natural gas	B8/32 Partners	25.0009	9.91	0.15	5.98	0.11	5.54	0.08
	PTTEP HV	100	1.82	0.03	1.78	0.03	1.66	0.02
	PTTEP HL	100	1.16	0.02	1.22	0.02	0.99	0.01
	Natuna	50	64.26	1.00	45.38	0.84	67.71	0.92
	PTTEP SP	100	183.30	2.85	154.94	2.87	175.13	2.39
	PTTEP SBO	100	0.05	0.00	0.19	0.00	121.95	1.66
	PTTEP SKO	100	72.07	1.12	83.01	1.54	71.97	0.98
	PTTEP MENA	100	-	-	-	-	218.78	2.98
	PKC	100	0.001	0.00	-	-	0.01	0.00
LPG	PTTEP	-	8.12	0.13	8.95	0.17	7.69	0.10
	PTTEPS	100	24.37	0.38	26.85	0.50	23.07	0.31
	PGC	100	8.75	0.14	22.59	0.42	42.24	0.58
Condensate	PTTEP	-	712.95	11.10	429.53	7.96	782.61	10.68
	PTTEPI	100	60.19	0.94	41.04	0.76	80.33	1.10
	PTTEPS	100	0.89	0.01	0.59	0.01	0.98	0.01
	PTTEP SP	100	59.61	0.93	31.04	0.57	59.11	0.81
	PTTEP SKO	100	5.10	0.08	5.79	0.11	7.62	0.11
	PTTEP MENA	100	-	-	-	-	163.89	2.24
Naphtha	PGC	100	2.81	0.04	9.19	0.17	20.45	0.28
Deemed income for tax payment by Oman government	PTTEP MENA	100	-	-	-	-	124.88	1.70
Total revenue from sales			6,046.42	94.10	5,043.17	93.42	6,730.86	91.83

Product	Operated by	% of shares held by the Company	2019		2020		2021	
			Revenue (Million US Dollar)	%	Revenue (Million US Dollar)	%	Revenue (Million US Dollar)	%
Revenue from pipeline transportation								
Pipeline transportation	MGTC	25.5	67.59	1.05	52.33	0.97	55.60	0.76
	TPC	19.3178	5.29	0.08	2.38	0.04	0.61	0.01
	ATL	80	43.52	0.68	37.64	0.70	36.94	0.50
Total revenue from pipeline transportation			116.40	1.81	92.35	1.71	93.15	1.27
Other income								
Gain on foreign exchange rates			108.60	1.69	26.06	0.48	-	-
Gain on remeasuring of financial instruments			-	-	99.33	1.84	-	-
Gain on debt modification			-	-	22.31	0.41	-	-
Gain from a bargain purchase			-	-	-	-	341.87	4.66
Interest income			86.23	1.34	36.73	0.68	16.75	0.23
Other income			55.39	0.87	37.01	0.69	131.60	1.80
Total other income			250.22	3.90	221.44	4.10	490.22	6.69
Total revenues			6,413.04	99.81	5,356.96	99.23	7,314.23	99.79
Share of profit of associates and joint ventures			12.35	0.19	41.64	0.77	15.17	0.21
Grand total after inclusion of share of profit of associates and joint ventures			6,425.39	100.00	5,398.60	100.00	7,329.40	100.00

For 2021, total revenues for PTTEP and its subsidiaries were USD 7,314 million (equivalent to THB 234,631 million), showed an increase of USD 1,957 million or 37% when compared to 2020 revenues at USD 5,357 million (equivalent to THB 167,418 million). The majority of the increase was USD 1,688 million growth of revenue from sales, primarily from petroleum sales revenue according to increases in average sales volume and average selling price. Higher average sales volume was mainly from the acquisition of Oman Block 61 Project in March 2021, along with Bongkot Project, Contract 4 Project, and Arthit Project due to higher gas nomination from buyers. Additionally, Malaysia Project carried out its first gas production from Block H Project in February 2021.

1.2.2 Products and Services

(1) Exploration and Production

Petroleum

Petroleum is defined as a naturally occurring hydrocarbon mixture, including crude oil, natural gas, condensate, related products, and other hydrocarbon products which are free in nature.

Crude oil is the portion of petroleum remains in liquid atmospheric pressure and temperature and obtained from oil wells and separation process, yet to be refined or purified.

Natural gas is hydrocarbon in gas or vapor phase at atmospheric temperature and pressure, commonly having methane as its major constituent.

Condensate is a low-density liquid hydrocarbon. It is condensed from hydrocarbon gas. Condensation occurs when gas is produced at the surface where temperature and pressure are lower than those in the reservoir.

Natural Gas Liquids (NGL) are components of natural gas that are separated from the gas state in the form of liquids. This separation occurs in a field facility or a gas processing plant. There are several types of natural gas liquids including Liquefied Petroleum Gas (LPG), which is obtained from crude oil refinery or natural gas separation process, and primarily consisting of butane and propane.

Crude oil, Condensate, and NGL are measured in barrel, while natural gas is measured in cubic foot at the standard conditions (One atmosphere or atm at 60 degrees Fahrenheit). All petroleum products can be converted to barrel of oil equivalent (BOE) based on their heat contents. One cubic foot of natural gas has a heating value of approximately 1,000 British thermal units (BTU), whereas one barrel of crude oil has a heating value of approximately 6,000,000 BTU.

Business Overview

The PTTEP Group's core business is the exploration and production of petroleum in Thailand and foreign countries. As of December 31, 2021, the PTTEP Group had petroleum exploration and production projects in 15 countries with the details as follows:

No.	Project Name	Phase	Location	Participation Interest	Operator
Thailand					
1	Bongkot Project	Production	Gulf of Thailand	66.6667%	PTTEP Group
2	S1 Project	Production	Upper Central	100%	PTTEP Group
3	PTTEP 1 Project	Production	Central	100%	PTTEP Group
4	B6/27 Project	Production	Gulf of Thailand	100%	PTTEP Group
5	Arthit Project	Production	Gulf of Thailand	80%	PTTEP Group
6	L22/43 Project	Production	Upper Central	100%	PTTEP Group
7	L53/43 & L54/43 Project	Production	Central	100%	PTTEP Group
8	E5 Project	Production	North East	20%	ExxonMobil
9	Contract 3 Project	Production	Gulf of Thailand	5%	Chevron
10	Contract 4 Project	Production	Gulf of Thailand	60%	Chevron
11	G4/43 Project	Production	Gulf of Thailand	21.375%	Chevron
12	Sinphuhorm Project	Production	North East	55%	PTTEP Group
13	B8/32 & 9A Project	Production	Gulf of Thailand	25.001%	Chevron
14	G4/48 Project	Production	Gulf of Thailand	5%	Chevron
15	G1/61 Project	Exploration	Gulf of Thailand	60%	PTTEP Group
16	G2/61 Project	Exploration	Gulf of Thailand	100%	PTTEP Group
Overlapping Area					
1	MTJDA Project	Production	Thailand-Malaysia	50%	CPOC
2	G9/43 Project	Exploration	Thailand-Cambodia	100%	PTTEP Group
Overseas					
Myanmar¹					
1	Zawtika Project	Production	Gulf of Moattama	80%	PTTEP Group
2	Yadana Project	Production	Gulf of Moattama	25.5%	TotalEnergies

¹ The PTTEP Group submitted a request to terminate and relinquish 100% of the exploration blocks of Myanmar M11 in September 2019. The official approval from the Government of the Republic of the Union of Myanmar was already obtained on November 22, 2021.

PTTEP Group submitted a request to terminate and relinquish 77.5% of the exploration blocks of Myanmar MOGE3 in July 2020. The official approval from the Government of the Republic of the Union of Myanmar was already obtained on November 24, 2021.

No.	Project Name	Phase	Location	Participation Interest	Operator
3	Yetagun Project	Production	Gulf of Moattama	19.31784%	PETRONAS
4	Myanmar M3 Project ²	Exploration	Gulf of Moattama	100%	PTTEP Group
5	Myanmar MD-7 Project ³	Exploration	Andaman Sea	50%	PTTEP Group
Malaysia					
1	Malaysia Project ⁴	Exploration/ Development/ Production	Offshore	7.2 ⁵ -80%	PTTEP Group
Vietnam					
1	Vietnam 9-2 Project	Production	Offshore	25%	HV JOC
2	Vietnam 16-1 Project	Production	Offshore	28.5%	HL JOC
3	Vietnam B & 48/95 Project	Exploration	Offshore	8.5%	Vietnam Oil and Gas Group
4	Vietnam 52/97 Project	Exploration	Offshore	7%	Vietnam Oil and Gas Group
Indonesia					
1	Natuna Sea A Project	Production	Offshore	11.5%	Premier Oil
Kazakhstan					
1	Dunga Project	Production	Onshore	20%	TotalEnergies
Oman					
1	Oman Block 61 Project ⁶	Production	Onshore	20%	BP

² On September 17, 2021, Mitsui Oil Exploration Company Limited (MOECO), a joint partner of the Myanmar M3 Project, withdrew its shareholding interest of 20% according to the Joint Operating Agreement, with effect on October 31, 2021. After such withdrawal, the PTTEP Group will holds 100% stake in the project. However, the completion of withdrawal is still pending to approval from the Government of the Republic of the Union of Myanmar.

³ The PTTEP Group submitted the block relinquishment Myanmar MD-7 Project notification letter to MOGE in October 2020 after fulfilling the obligations under the Product Sharing Contract. The relinquishment will be effective after the official approval from the Government of the Republic of the Union of Myanmar.

⁴ The PTTEP Group has named investments of all projects in Malaysia under 'Malaysia Project', which comprises several petroleum blocks where the PTTEP Group is the Operator. The participating interests vary from 42-80%, except for one area named Gumusut-Kakap (GK) in Block K where PTTEP is a joint venture partner with participating interest of 7.2%, and Shell is the Operator.

⁵ On March 15, 2021, PTTEP Sabah Oil Limited (PTTEP SBO), a subsidiary of the PTTEP Group, obtained approval from the Malaysian Government to increase the interest of GK Block, under the Block K Project, from 6.366% to 6.555%, with effect from January 1, 2020. Moreover, on December 30, 2021, Sabah Shell Petroleum Company Limited (SSPC), the operator of GK Block, obtained another approval from the Malaysian Government to change the interest of GK Block under the Unitisation and Unit Operating Agreement (UUOA). Therefore, the working interest of PTTEP Group had increased from 6.555% to 7.1666%.

⁶ On February 1, 2021, the PTTEP Group signed a Sale and Purchase Agreement to acquire the 20% interests in Block 61 from BP Exploration (Epsilon) Limited (BP). The transaction was completed and in effect on March 23, 2021.

No.	Project Name	Phase	Location	Participation Interest	Operator
2	PDO (Block 6) Project	Production	Onshore	2%	Petroleum Development Oman
3	Mukhaizna (Block 53) Project	Production	Onshore	1%	Occidental Petroleum
4	Oman Onshore Block 12 Project	Exploration	Onshore	20%	TotalEnergies
United Arab Emirates					
1	Abu Dhabi Offshore 1 Project	Exploration	Offshore	30%	Eni Abu Dhabi B.V.
2	Abu Dhabi Offshore 2 Project	Exploration	Offshore	30%	Eni Abu Dhabi B.V.
3	Abu Dhabi Offshore 3 Project	Exploration	Offshore	30%	Eni Abu Dhabi B.V.
Algeria					
1	Algeria 433a & 416b Project	Production	Onshore	35%	GBRS
2	Algeria Hassi Bir Rekaiz Project ⁷	Development	Onshore	49%	PTTEP Group
Mozambique					
1	Mozambique Area 1 Project	Development	Offshore	8.5%	TotalEnergies
Angola					
1	Block 17/06 Project	Exploration	Offshore	2.5%	TotalEnergies
Australia					
1	PTTEP Australasia Project ⁸	Exploration	Offshore	90-100% ⁹	PTTEP Group
Canada					
1	Mariana Oil Sands Project	Exploration	Onshore	100%	PTTEP Group
Brazil¹⁰					
1	Barreirinhas AP1 Project	Exploration	Offshore	25%	Shell Brasil
2	Brazil BM-ES-23 Project	Exploration	Offshore	20%	Petrobras
Mexico					
1	Mexico Block 12 (2.4) Project	Exploration	Offshore	20%	PC Carigali Mexico
2	Mexico Block 29 (2.4) Project	Exploration	Offshore	16.67%	Repsol Exploración México

⁷ On September 1, 2021, the PTTEP Group, with 24.5% participating interests, is the Operator of Algeria Hassi Bir Rekaiz, Project in People's Democratic Republic of Algeria, received an approval from the Government of People's Democratic Republic of Algeria to acquire the 24.5% shareholding interest in the Project from CNOOC Limited, a joint partner. The shareholding interest then increased to 49% from such date. SONATRACH, National oil company of Algeria, is a partner in this project with 51% participating interest.

⁸ On November 19, 2021, PTTEP Australasia (Ashmore Cartier) Pty Ltd submitted the request for the relinquishment of AC/L3 Project in Australia, which will be effective after the official approval from the government.

⁹ PTTEP Australasia Project comprises several petroleum blocks, which the participating interests vary from 90-100%.

¹⁰ On July 30, 2021, the PTTEP Group signed a Sale and Purchase Agreement to sell its 100% interest in Partex Brasil Ltda., which holds 50% participating interest in the Potiguar Project. The transaction was completed and in effect on October 29, 2021.

Principal Projects in Operation

The following is a summary of project activities undertaken during 2021. Production and sales figures described hereunder are total production and sales figures for the respective projects.

1) Project Activity Highlights in Thailand

Most PTTEP Group's projects in Thailand are in the production phase, located both in the Gulf of Thailand and onshore. The following are the highlights of key project activities in Thailand during 2021.

Bongkot Project

The Bongkot Project is located in the southern part of the Gulf of Thailand, consisting of Bongkot North and Bongkot South fields (Blocks B15, B16, and B17). The PTTEP Group currently has held 66.6667% interest after the completion of the additional stake of 22.2222% in Blocks B15, B16, and B17 from Shell Integrated Gas Thailand Pte. Ltd. (Shell) and Block G12/48 from Thai Energy Company Limited (a wholly-owned subsidiary of Shell) since June 2018 when the PTTEP Group is the operator. The project has been produced since 1993. All of natural gas and condensate produced from the Bongkot Field is sold to PTT, under a Take-or-Pay basis pursuant to long-term Gas Sales Agreements (GSA).

In 2021, the infill drilling was developed to maintain production volume. The Block G12/48, located adjacent to the east of Bongkot South Field is held and operated by the PTTEP Group with 66.6667% working interest. The production area and development plan were approved by the Department of Mineral Fuels in March 2015. The production was started on October 20, 2018, through Bongkot South Field's Central Processing platform. The natural gas has been sold to PTT under Bongkot South gas sale agreement. The average sales volume in 2021 was 850 million standard cubic feet per day (MMSCFD) for natural gas [equivalent to approximately 134,800 barrels of oil equivalent per day (BOED)] and approximately 22,200 barrels per day (BPD) of condensates.

In addition, in 2021, the PTTEP Group (Bongkot Project) entered into the Memorandum of Agreement relating to Bongkot end of concessions (MOA) with TotalEnergies, a joint partner of Bongkot Project, for the PTTEP Group to be a sole risk operator for the infill drilling where the company shall recognize all revenues and costs from the produced petroleum.

S1 Project

The S1 Project is the largest onshore oil field in Thailand, with the production area covering parts of Kamphaeng Phet, Sukhothai, and Phitsanulok provinces. The PTTEP Group is the operator with 100% of interest. On November 24, 2020, S1 Project was officially approved of the extension of petroleum production period for another 10 years, until March 2031.

The product from the S1 Project consists of crude oil, natural gas, and liquefied petroleum gas (LPG). Crude oil produced at S1 is sold to PTT and is transported via truck and rail to the refineries of Thai Oil Public Company Limited, Bangchak Corporation Public Company Limited (Bangchak) refineries, PTT Global Chemical Public Company Limited, and IRPC Public Company Limited. The produced gas from the project is sold to PTT, UAC Global Public Company Limited, and Thai Housewives Product for Climate Change Protection Cooperative Limited (TCCT), and the other part that undergoes LPG separation will be sold to PTT.

During 2021, the Project continuously drilled additional production wells with exploration drilling plan to maintain its production level. Environmental impact assessments were also undertaken in both existing and new production areas. The project's average sales volume of crude oil was approximately 26,400 BPD, while the sales volume of natural gas averaged 8 MMSCFD (approximately 1,500 BOED), and the average LPG sales volume was 190 metric tons per day (approximately 1,500 BOED).

PTTEP 1 Project

The PTTEP 1 Project is located in Suphan Buri and Nakhon Pathom provinces. The PTTEP Group is the sole owner and operator. Crude oil produced at the project is sold to PTT and is transported via truck to the Bangchak refinery. In 2021, the project's average sales volume of crude oil was approximately 200 BPD.

B6/27 Project

The B6/27 Project is located in the Gulf of Thailand, off the coast of Chumphon Province. The PTTEP Group is the sole owner and operator. The concession contract will end in February 2023. Currently, the project is in the preparation process for decommissioning.

In 2021, the Department of Mineral Fuels (DMF) already approved for the Decommissioning Environmental Assessment (DEA) report and the Best Practicable Environmental Option (BPEO) report. Currently, Final Decommissioning Plan (FDP) and Decommissioning Cost Estimation (DCE) are in progress for submission to DMF in the next step.

Arthit Project

The Arthit Project is located in the southern part of the Gulf of Thailand. The PTTEP Group has 80% participating interest in the project. The project entered into long-term natural gas and condensate agreement with PTT on a take-or-pay basis.

During the year 2021, the project has successfully installed 3 wellhead platforms, 1 topside reused platform and gas pipelines, alongside with production wells drilling in order to maintain production levels. The average natural gas sales volume for the project was approximately 240 MMSCFD (approximately 39,000 BOED), and the average condensate sales volume was approximately 12,400 BPD.

Block G8/50, located adjacent to the north of Arthit Project and held and operated by the PTTEP Group with 80% working interest, produced through Arthit Project's central processing platform with the natural gas being sold to PTT under Arthit Project's sales contract. Since March 2019, G8/50 has ceased production. However, this does not affect the total sales volume of the Arthit Project.

L22/43 Project

The L22/43 Project is located in Phitsanulok and Pichit provinces. The PTTEP Group is the sole owner and operator. The project has been temporarily stopped the production since 2018. Currently, the project is completely revisited the field potential to economically resumed production in 2023.

L53/43 and L54/43 projects

The L53/43 and L54/43 projects are located in Suphan Buri, Kanchana Buri, Phra Nakhon Si Ayutthaya, and Ang Thong provinces. The PTTEP Group is the sole owner and operator. Crude oil produced from the project is sold to PTT and is transported via truck to the Bangchak refinery.

In 2021, the L54/43 Project's average crude oil sales volume was approximately 670 BPD. The L53/43 Project has shut down since 2019.

E5 Project

The E5 Project is located in Khon Kaen Province. The PTTEP Group holds 20% participating interest in the project with ExxonMobil as the operator with 80% participating interest. All of the natural gas produced by the E5 Project is sold to PTT on a take-or-pay basis pursuant to a long-term GSA. The project has been completely approved the amendment of gas sales agreement with PTT since October 2021 for 10 years until the end of concession. The natural gas is supplied through pipelines to EGAT's Nam Phong Power Plant.

In 2021, the project's average sales volume of natural gas sales was 7.5 MMSCFD (approximately 1,200 BOED).

Contract 3 Project

The Contract 3 Project is located in the Gulf of Thailand, off the coast of Surat Thani Province. The PTTEP Group holds a 5% interest in the project with Chevron as the operator. All of the natural gas and condensate produced from the project is sold to PTT according to long-term gas and condensate sales agreements, whilst the produced crude oil is under annual sales agreement and spot cargo with other purchasers.

In 2021, the project had no development drilling activity, as the concession will end in 2022 and the production level gradually decreased accordingly. The average sales volume of the project was approximately 410 MMSCFD (approximately 67,700 BOED) for natural gas, approximately 11,200 BPD for crude oil, and approximately 12,200 BPD for condensates.

Contract 4 Project

The Contract 4 Project and Block G7/50 are located in the Gulf of Thailand. The PTTEP Group holds a 60% interest in the project, with Chevron as the operator. All of the natural gas and condensate produced from the project is sold to PTT under long-term gas and condensate sales agreements.

In the year 2021, the Project sold natural gas at an average rate of approximately 400 MMSCFD (approximately 64,500 BOED) and condensates at an average rate of approximately 15,700 BPD. The project continued to drill additional development wells aiming to maintain production plateau.

G4/43 Project

The G4/43 Project is located in the Gulf of Thailand. The PTTEP Group holds a 21.375% interest in the project with Chevron as the operator. The project has mutual long-term GSA and crude oil sale agreements with the B8/32 & 9A Project.

In the year 2021, the project had no development drilling activities. The sales volume of crude oil and natural gas averaged approximately 3,000 BPD and 1 MMSCFD (equivalent to approximately 180 BOED), respectively.

Sinphuhorm Project (EU-1 and E5-North)

The Sinphuhorm Project is located in Udon Thani and Khon Kaen provinces. The PTTEP Group is the operator which holds directly and indirectly 55% participating interest in Sinphuhorm Project after the acquisition of 33.8% and 39% stakes in APICO from Tatex and Coastal Energy in 2019, respectively. APICO has 35% participating interest in Sinphuhorm Project. Currently, the project has been completely approved new gas sale agreement with PTT since October 2021 for 10 years until the end of concession. The natural gas is continued to supply through the pipeline to EGAT's Nam Phong Power Plant. The new investment plan will be fulfilled the development plans and activities to support the new GSA's commitment and obligation.

In 2021, the project's average sales volume of natural gas sales was 90 MMSCFD (approximately 14,900 BOED) and approximately 260 BPD for condensates.

B8/32 & 9A Project

The B8/32 & 9A Project is located in the Gulf of Thailand, off the coast of Chumphon Province. The PTTEP Group holds a 25% interest in the project with Chevron as the operator. The project currently has long-term GSAs with PTT and annual crude sales agreement with other purchasers for spot cargos.

During the year 2021, the project continued to carry out development drilling and waterflood operations in order to maintain the crude oil production levels. Sales volume averaged approximately 14,000 BPD for crude oil and approximately 48 MMSCFD for natural gas (approximately 8,100 BOED).

G4/48 Project

The G4/48 Project is located in the Gulf of Thailand, off the coast of Surat Thani Province. The PTTEP Group holds 5% interest in the project with Chevron as the operator. The project has mutual long-term gas sales agreements and crude oil sale agreements for spot cargo with the Contract 3 Project.

In the year 2021, sales volume from the project averaged 1 MMSCFD for natural gas (equivalent to approximately 200 BOED) and approximately 130 BPD for crude oil.

G1/61 Project

The G1/61 Project is an exploration and production project, under the Production Sharing Contract scheme (PSC). The project is located in the Gulf of Thailand where the existing concession, Block 10-13 (Erawan Field), will expire in 2022, with Chevron as the operator. From the results of Thailand Petroleum Bidding Round for the expired concessions in 2022-2023 in the Gulf of Thailand announced on December 13, 2018, the PTTEP Group together with Mubadala Petroleum, were awarded the right to explore and produce petroleum in G1/61 (Erawan Field) with the holding interest of 60% and 40% respectively with PTTEP Group as the operator. The Production Sharing Contract (PSC) was later signed on February 25, 2019.

In 2021, the Project continued its transitional efforts including several Agreements (including Site Access Agreement) signing with the existing concessionaires, platform constructions, staff recruitments, sales agreement negotiation,

and procurement activities in preparation for readiness for production and operations. The Project has been closely coordinating with the existing concessionaires and the Department of Mineral Fuels with determination to achieve successful transition and deliver our gas production, as committed under the PSC.

G2/61 Project

The G2/61 Project is an exploration and production project, under Production Sharing Contract (PSC). The Project is located in the Gulf of Thailand where the existing concession, Block 15, 16, and 17 (Bongkot Field), will expire in 2022 and 2023, with the PTTEP Group as the operator. From the results of Thailand Petroleum Bidding Round for the expired concessions in 2022-2023 in the Gulf of Thailand announced on December 13, 2018, the PTTEP Group was awarded the right to explore and produce petroleum with the participating interest of 100% for G2/61 (Bongkot Field) and is the operator. The Production Sharing Contract (PSC) was later signed on February 25, 2019.

In 2021, the project continued transition work plan, including new production platforms construction plan, site survey for new production platform construction, and installation of new platform and started drilling new development wells. These development and exploration activities will be continued from this year and on to ensure gas production at the minimum volume stated in the PSC of 200 MMSCFD in 2022 and 700 MMSCFD in 2023.

Projects Located in Overlapping Areas

MTJDA Project

The PTTEP Group has a 50% participating interest in the MTJDA Project with Carigali-PTTEPI Operating Company Sdn. Bhd. (CPOC) as the operator. The PTTEP Group, Petronas (Malaysia's natural oil company) and the Malaysia-Thailand Joint Authority (MTJA) executed a GSA for the sales of the natural gas from the MTJDA Project to PTT and PETRONAS, whilst crude oil and condensates produced from the project were sold through auction.

During the year 2021, the Project continuously drilled production and infill wells to maintain the production level. The project has an average sales volume of approximately 170 MMSCFD (approximately 26,900 BOED) for natural gas and approximately 3,100 BPD for condensates.

G9/43 Project

The G9/43 Project is located in the Gulf of Thailand with the PTTEP Group as the sole owner and operator. At present, all activities for this project were suspended, pending the resolution of the boundary dispute between the governments of Thailand and Cambodia.

2) International Projects

The PTTEP Group has overseas projects separated into the following regions.

2.1) Project Activity Highlights in Other Southeast Asia Countries

The PTTEP Group has projects in this region which are located in Myanmar, Malaysia, Vietnam, and Indonesia. The following section highlights the project activities.

Zawtika Project

The Zawtika Project is a gas project located in the Gulf of Moattama, Myanmar. The PTTEP Group holds 80% participating interest and is the operator, with Myanmar Oil and Gas Enterprise (MOGE) holding the remaining 20% interest. The gas produced from this project is sold to PTT, supplying Thai market under long-term GSA on a take-or-pay basis; and sold to MOGE for domestic consumption in Myanmar under the long-term sales contract. To transport natural gas from Zawtika Project to Thailand, the PTTEP Group and the joint venture partners established a gas transportation company called Andaman Transportation Limited (ATL) to construct and operate an offshore and onshore pipeline from the project to the Thai border. The project commenced its gas sales in Myanmar in March 2014 and began delivering natural gas to PTT in August 2014.

In 2021, under the COVID-19 and local unrest situation in Myanmar, the Project could still deliver gas as per commitment and obligation under GSAs and monitor the situation closely, identify potential risk, and prepare asset readiness following the Business Continuity Management (BCM) plan to ensure uninterrupted supply of petroleum, including close coordination with PTT, the Department of Mineral Fuels, the Ministry of Energy and Ministry of Foreign Affairs, on a regular basis.

Moreover, the Project has been developing Phase 1D as per Field Development Plan to maintain gas production in accordance with existing obligations. Currently, the production platform construction work is on track. The average sales volume of natural gas for the project in 2021 was 320 MMSCFD (approximately 51,000 BOED).

Yadana Project

The Yadana Project is a large gas project located in the Gulf of Moattama, Myanmar. The PTTEP Group holds a 25.5% interest with TotalEnergies as the operator. Natural gas produced from the project is sold to PTT on a take-or-pay basis pursuant to long-term GSA, and a certain portion is sold to MOGE for domestic use in Myanmar. To transport natural gas from Yadana to Thailand, the PTTEP Group and our joint venture partners established a gas transportation company, called Moattama Gas Transportation Company (MGTC), to construct and operate an offshore and onshore pipeline from the Yadana Project area to the Thai border. Then, PTT completed an onshore pipeline section from the Thai border to the EGAT power generation plant in Ratchaburi Province.

In 2021, two production wells were completed as planned in Yadana and Badammyar fields in order to maintain production volume and ensure gas delivery, as stated in the long-term gas sales agreement. In 2021, the average gas sales volume was at 770 MMSCFD (approximately 95,000 BOED).

Yetagun Project

The Yetagun Project is a natural gas and condensates producing project located in the Gulf of Moattama, Myanmar. The PTTEP Group holds a 19.31784% interest in the project with PC Myanmar (Hong Kong) Limited as the operator. All of the natural gas from the Yetagun Project is sold to PTT on a take-or-pay basis pursuant to long-term GSA. To transport natural gas from Yetagun Project to Thailand, the PTTEP Group and the joint venture partners established a gas transportation company called Taninthayi Pipeline Company (TPC) to construct and operate an offshore pipeline and an onshore pipeline (parallel to the Yadana pipeline) from the project to the Thai border.

During the year 2021, the Project suspended the production due to insufficient natural gas for minimum production and the COVID-19 situation. In Q4/2021, the production was resumed. The project's total sales volume averaged 17 MMSCFD (approximately 2,600 BOED) for natural gas and approximately 560 BPD for condensates.

Myanmar M3 Project

The Myanmar M3 Project is located offshore, in the Gulf of Moattama, Myanmar. The PTTEP Group holds 80% participating interest in the project and is the operator. The Field Development Plan of M3 was approved in April 2021. The PTTEP Group is now waiting for the approval of PSC Supplementary from the Government of Myanmar and is under necessary preparations to proceed for development.

On September 17, 2021, Mitsui Oil Exploration Company Limited (MOECO), a joint partner of Myanmar M3 Project, was notified to withdraw its shareholding interest at 20%. The withdrawal was effective on October 31, 2021. As a result, The PTTEP Group currently holds the shareholding interest at 100% in this project. However, the completion of the withdrawal is still pending the approval from the Government of Myanmar.

The Domestic Gas to Power project is an integrated energy project covering the entire supply chain from exploration and production, gas transportation, and a gas-fired power plant in Myanmar. At the initial stage, The PTTEP Group plans to feed the natural gas from Zawtika and Myanmar M3 Project to supply a new power plant with a capacity of 600 megawatts for domestic consumption. After the approval of Notice to Proceed from Myanmar Government back in December 2020, the project has been facing delay including the Final Investment Decision (FID) as a result of the local political situation and COVID-19. The PTTEP Group is still closely monitoring the situations to assess risks as well as to prepare for an appropriate action plan.

Myanmar M11 Project

The Myanmar M11 Project is located offshore, in the Gulf of Moattama, Myanmar. The PTTEP Group is the sole owner and operator. The project submitted the block relinquishment notification letter in September 2019. The relinquishment was approved by the Government of Myanmar in November 2021.

Myanmar MD-7 Project

The MD-7 Project is located in the deep water of the Gulf of Moattama, Myanmar. The PTTEP Group has a 50% participating interest in the project and is the operator. TotalEnergies joined the consortium with 50% participating interest in 2017.

The Myanmar MD-7 Project completed the drilling of an exploration well in March 2020 with no confirmed commercial reserves. The project submitted the block relinquishment notification letter in October 2020 after fulfillment of the requirements under the Product Sharing Contract. The relinquishment will be effective after obtaining the official approval from the Government of Myanmar.

Myanmar MOGE 3 Project

The Myanmar MOGE 3 Project is an onshore project located in Myanmar. The PTTEP Group holds a 77.5% participating interest and is the operator of this project. The Project submitted the block relinquishment notification letter

in July 2020 after fulfilment of the requirements under the Product Sharing Contract. The relinquishment was approved by the Government of Myanmar in November 2021.

The Malaysia Project

On March 21, 2019, the PTTEP Group acquired 100% of Murphy Oil Corporation's (Murphy) business in Malaysia. The agreement was completed in July 2019. Subsequently, the PTTEP Group has named investments of all projects in Malaysia under Malaysia Project. The details are as follows:

The Block K Project consists of Kikeh, Siakap North-Petai (SNP), and Gumusut-Kakap (GK) fields which are producing oil fields located in the deep water of offshore Sabah, Malaysia. The PTTEP Group holds participating interest of 56% and 22.4% in the Kikeh and SNP fields respectively and is the operator. The PTTEP Group holds participating interest of 7.1666% in the GK Field with Shell as the operator.

In 2021, the project had an average production volume for crude oil of approximately 24,000 BPD and 26 MMSCFD for natural gas. The main projects for 2022 are the development drilling for Kikeh and GK.

The Sarawak SK 309 and SK 311 projects are oil and gas producing fields in the shallow water areas of offshore Sarawak, Malaysia. The PTTEP Group holds a participating interest of 59.5% in all fields except the Patricia oil field, where the company has a 42% participating interest, and operates all fields in the blocks.

In 2021, the projects had a total average crude and condensate production rate of approximately 16,200 BPD and an average gas rate of approximately 160 MMSCFD. For 2022, the main projects are infill development drilling at Serampang, West Patricia, and Permas.

The Block H Project is made up of natural gas fields in the development phase located in the deep water of offshore Sabah, Malaysia. The PTTEP Group holds 56% interest in Rotan Field and 42% interest in the remaining areas.

The Project had started the natural gas production since early February 2021 and was able to reach full production capacity of 270 MMSCFD. For 2022, there are two exploration wells planned for this project.

The Sarawak SK 410B Project is located offshore Sarawak, Malaysia. The PTTEP Group holds participating interest of 42.5% in the project and is the operator. The Project completed the Lang Lebah-2 appraisal well in January 2021 with larger-than-expected reservoir size. Therefore, the field development plan is being revised following to planned increasing production capacity. The revised development plan was completed in 2021. 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 concludes the potential of new petroleum prospects and plans to drill at least 1 new exploration well in 2022.

The Sarawak SK 314A Project is located in the shallow water of offshore Sarawak, Malaysia. The PTTEP Group holds participating interest of 59.5% in the project and is the operator. Between 2020-2021, the project was in the process of evaluating field's resources potential and performing 3D seismic reprocessing in order to prepare for the drilling of 2 exploration wells in 2022.

The Sarawak SK 417 Project is located in the shallow water of offshore Sarawak, Malaysia. The PTTEP Group holds participating interest of 80% in the project and is the operator. Successful exploration wells Dokong-1 were completed in January 2021 and Nangka-1 in September 2021. In addition, the remaining one appraisal well is planned to be drilled in 2022 as per exploration commitment. With the new exploration strategy between 2020-2021, the project requested another 2-year exploration extension from 2021 to 2023 in order to drill an additional exploration well in 2022.

The Sarawak SK 438 Project completed Kulintang-1 exploration well in April 2021. The project discovered a satisfactory reservoir of natural gas and will continue studying on an additional appraisal program and development plan for this field. In addition, exploration well Mak Yong-1 drilling was completed in June 2021 and the remaining petroleum potential in that area is being evaluated. Currently, the Project is studying on further petroleum potential in the areas for the next exploration campaign.

The Sarawak SK 405B Project is located in the shallow water of offshore Sarawak, Malaysia. The PTTEP Group holds participating interest of 59.5% in the project and is the operator. After the discovery of crude oil and natural gas reservoir by Sirung-1 well in March 2021, the project is currently studying on upside petroleum potential in this area for future exploration/appraisal campaigns.

The Peninsular PM 407 Project is located in the shallow water of offshore Peninsular, Malaysia. The PTTEP Group holds participating interest of 55% and is the operator. In the year 2021, the project performed 3D seismic reprocessing together with the studies on petroleum potential. Currently, the project is in progress of planning for the further exploration strategy.

The Peninsular PM 415 Project is located in the shallow water of offshore Peninsular, Malaysia. The PTTEP Group holds participating interest of 70% and is the operator. In 2021, the project was in the process of post-drilling evaluation, after an exploration well drilled in 2020, together with the remaining petroleum potential evaluation, which will result in the upcoming exploration strategy of the block in the near future.

Vietnam 9-2 Project

The Vietnam 9-2 Project is located offshore southeast of Vietnam. The PTTEP Group has a 25% interest in the project with Hoan Vu Joint Operating Company as the operator. The crude oil produced from the project is sold to domestic refineries while the produced natural gas is sold to Vietnam Oil and Gas Group, a state-owned enterprise, for domestic consumption.

In 2021, the Project prepared Revised Full Field Development Plan (RFFDP) and is now waiting for Vietnam Oil and Gas Group approval. The project had an average sales volume for natural gas of 14 MMSCFD (approximately 2,700 BOED) and for crude oil of approximately 3,600 BPD.

Vietnam 16-1 Project

The Vietnam 16-1 Project is located offshore of Vietnam. The PTTEP Group has a 28.5% interest in the project, with Hoang-Long Joint Operating Company as the operator. The crude oil production of the project is sold to domestic refineries and exported to international market through a bidding process. Natural gas is sold to the Vietnam Oil and Gas Group, a state-owned enterprise, for domestic consumption.

In 2021, the project completed drilling campaign of four development wells from Q3 to Q4/2021. The average sales volume was approximately 6 MMSCFD of natural gas (approximately 1,400 BOED) and 12,700 BPD of crude oil.

Vietnam B & 48/95 Project

The Vietnam B & 48/95 Project is located offshore of Vietnam. The PTTEP Group holds 8.5% of participating interest in the project with Vietnam Oil and Gas Group as the operator. The Project was granted approval for the Field Development Plan and is currently in the negotiation process on commercial terms in order to push forward the Final Investment Decision (FID) with targeted first production by the end of 2025, and ramping up to 490 MMSCFD, including the production from Vietnam 52/97 Project.

Vietnam 52/97 Project

The Vietnam 52/97 Project is located offshore of Vietnam. The PTTEP Group holds 7% of participating interest in the project with Vietnam Oil and Gas Group as the operator. The project was granted approval for the Field Development Plan and is currently in the negotiation process on commercial terms in order to push forward the Final Investment Decision (FID) with targeted first production by the end of 2025 and ramping up to 490 MMSCFD, including the production from Vietnam B & 48/95 Project.

Natuna Sea A Project

The Natuna Sea A Project is located in the west of the Natuna Sea in Indonesia. In 2013, the PTTEP Group jointly signed a share purchase agreement with Pertamina, on a 50:50 basis, to acquire subsidiaries of Hess Corporation holding 23% interest in the Natuna Sea A Project. As a result, PTTEP holds 11.5% interest in the project, with Premier Oil as the operator. The crude oil and condensate produced are sold through National Oil Company (Pertamina), while natural gas produced is sold in Singapore for domestic consumption.

In 2021, the average sales volume for natural gas was approximately 200 MMSCFD (approximately 35,800 BOED) and for oil is approximately 1,700 BPD. In 2022, the project plans to drill two development wells in order to maintain gas potential and gas production rate.

2.2) Project Activity Highlights in Central Asia

The PTTEP Group's project in this region is located in the Republic of Kazakhstan (Kazakhstan), with the key project highlights as follows:

Dunga Project

The Dunga Project is a producing oil field located onshore west of Kazakhstan. The PTTEP Group holds 20% interest, with TotalEnergies as the operator. In 2021, the project had an average sales volume for crude oil of approximately 12,500 BPD and natural gas of 2 MMSCFD (approximately 370 BOED). Besides, the Project is under the development of Dunga Phase 3 which will increase the production capacity to 17,000-18,000 BPD in 2023.

2.3) Project Activity Highlights in the Middle East

The PTTEP Group's projects in this region are located in Oman and UAE.

Oman Block 61

The Oman Block 61 is a producing onshore gas block situated in central Oman. The PTTEP Group has signed a Sale and Purchase Agreement (SPA) to acquire 20% of interest from BP Exploration (Epsilon) Limited, which is the operator, and the agreement was completed on March 23, 2021. The project currently has a full production capacity of natural gas and condensate according to the Sales and Purchase Agreement at 1,500 MMSCFD and 69,000 barrels per day (BPD), respectively.

PDO (Block 6) Project

The PDO (Block 6) Project is the largest producing oil asset in central Oman, covering an area of approximately one-third of the country. The PTTEP Group holds 2% participating interest in this project, with Petroleum Development Oman (PDO) as the operator (Operating Consortium). In 2021, the project had an average sales volume of approximately 640,000 BPD.

Mukhaizna (Block 53) Project

The Mukhaizna (Block 53) Project is a large producing onshore oil field located in southern Oman. The PTTEP Group holds 1% participating interest in this project, with Occidental Oman as the operator. In 2021, the project had an average sales volume for crude oil of approximately 95,000 BPD.

Oman Onshore Block 12 Project

The Oman Onshore Block 12 is a large onshore exploration block with an acreage of around 10,000 square kilometers, located in central Oman. The PTTEP Group holds 20% participating interest in the project, with TotalEnergies as the operator. Currently, the project continues geological and geophysical studies throughout the year 2022 and plan to drill the two exploration wells in 2023.

Abu Dhabi Offshore 1 Project

The Abu Dhabi Offshore 1 Project is located in the offshore northwest of Abu Dhabi, UAE. The PTTEP Group holds 30% participating interest in the project, with Eni Abu Dhabi B.V. as the operator. Currently, the project is in the subsurface evaluation process of the petroleum potential for future exploration, including the preparation of Geological and Geophysical study reports.

Abu Dhabi Offshore 2 Project

The Abu Dhabi Offshore 2 Project is located in the offshore northwest of Abu Dhabi, UAE. The PTTEP Group holds 30% participating interest in the project, with Eni Abu Dhabi B.V. as the operator.

The project started drilling an exploration well in September 2021. Currently, the project is preparing to drill a appraisal well, including further evaluation of petroleum potential for drilling another exploration well in 2022.

Abu Dhabi Offshore 3 Project

The Abu Dhabi Offshore 3 Project is located in the offshore northwest of Abu Dhabi, UAE. The PTTEP Group holds 30% participating interest in the project, with Eni Abu Dhabi B.V. as the operator with the size covering a total area of 11,660 square kilometers (largest offshore exploration block among all of the areas open for bidding in UAE).

Currently, the project is in progress of petroleum potential evaluation for the preparation of appraisal well and exploration well which to be drilled in 2023-2024.

Sharjah Onshore Area C Project

The PTTEP Group has signed a Farm-in/Farm-out Agreement to acquire 25% stake in the the Sharjah Onshore Area C Project from Eni Sharjah B.V. The Project is situated in the central part of Sharjah UAE, covering an area of approximately 1,184 square kilometers. The acquisition will be completed after fulfilling all conditions in the agreement and obtaining all necessary government approvals, expected completion date in early 2022.

Upon the completion of the acquisition, Eni Sharjah B.V. (Operator) will hold 50% participating interest while SNOC will hold 25% and The PTTEP Group 25% respectively. According to the exploration plan, a 3D Seismic survey is being conducted on the block during late 2021-2022 to assess its hydrocarbon potential.

2.4) Project Activity Highlights in Africa

The PTTEP Group's projects in this region are located in Algeria, Mozambique, and the Republic of Angola (Angola), with the key project highlights as follows:

Algeria 433a & 416b Project

The Algeria 433a & 416b Project is located onshore in eastern Algeria. The PTTEP Group holds a 35% participating interest in the project, with Groupement Bir Seba (Joint Operating Company) as the operator. In 2021, OPEC+ continued production quota cut. In addition, plant full shutdown for 3-yearly preventive maintenance for the period of 9 days in September 2021. Consequently, the project's average production for crude oil in 2021 was at approximately 16,300 BPD.

Algeria Hassi Bir Rekaiz Project

The Algeria Hassi Bir Rekaiz Project is located onshore in eastern Algeria. The PTTEP Group holds a 49% interest (after the acquisition of 24.5% participating interest from CNOOC was completed in August 2021) and is the operator with SONATRACH, Algeria's national oil company, as the main investor with the participating interest of 51%.

The Project has started development on Phase 1 following the conclusion with partners and its approved development plan by ALNAFT (Agence Nationale pour la Valorisation des Ressources en Hydrocarbures – Regulating body of Hydrocarbon Exploration & Production). The development activities commenced in March 2019. The first oil production for the initial phase of 10,000-13,000 BPD is expected in 2022, with a plan for the second phase production capacity ramping up to around 50,000-60,000 BPD in late 2026-2027.

Mozambique Area 1 Project

The Mozambique Area 1 Project, which is a large LNG project located in offshore Mozambique, is currently in the development phase. The PTTEP Group holds 8.5% participating interest in the project, with TotalEnergies as the operator.

In 2021, the Project commenced foundation work for onshore LNG facilities, temporary Beach Landing, subsea pipeline dredging, and construction of security infrastructures. The project finance had closed and the first debt drawdown was achieved. However, due to the Palma security situation 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 the 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 Defence Force (RDF) deployed military to support Mozambique to deal with the terrorists in Cabo Delgado, where the project is located. The troops are currently stationed in the area and are undergoing military action to restore security in the north of the country and surrounding projects' 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.

Block 17/06 Project

The Block 17/06 Project is located in the offshore west coast of Angola. The PTTEP Group holds 2.5% interest in the project and TotalEnergies is the operator. The Project was part of the acquisition of Partex Holding B.V. and planned for Final Investment Decision (FID) in 2022.

2.5) Project Activity Highlights in Australasia

The PTTEP Group has one project in this region which is located in the Timor Sea, Australia comprising 7 concession permits with the following as key highlights:

PTTEP Australasia Project

- *Cash-Maple Field (AC/RL7), Orchid Field (AC/P54), and Oliver Field (AC/RL12)*: All are gas fields, the main fields are Cash Maple and Orchid. Currently, both are under way to define proper direction of the project in order to increase development opportunities. For Oliver Field, the additional geological study is being carried out.

- *Tenacious Field (AC/RL4)*: In 2020, Block AC/RL4 which is an oil field was renewed for a short term to complete the wells' abandonment in 2023 prior to the block relinquishment.

- *Audacious Field (AC/RL6), Katandra Field (AC/RL10), and Challis (AC/L3)*: In 2021, conducted additional geological studies of Audacious and Katandra fields. The project is under way considering the proper direction to manage these oil fields.

- *Challis Field (AC/L3)* Surrender the permit in November 2021 due to the fact that the resources potential does not support the project commerciality.

2.6) Project Activity Highlights in North and South America

The PTTEP Group's projects in this region are located in Canada, Brazil, and United Mexican States (Mexico). The following are significant activities in this region:

Mariana Oil Sands Project

The Mariana Oil Sands Project is located in Alberta, Canada. The PTTEP Group holds 100% participating interest and is the operator of the Thornbury, Hangingstone, and South Leismer fields. Well abandonment campaign and reclamation activities were conducted in 2021 prior to the surrender of all leases according to the relevant regulations.

Potiguar Project

The PTTEP Group signed a Sale and Purchase Agreement to sell its 100% interest in Partex Brasil Ltda., which holds 50% participating interest in the Potiguar Project. The transaction was completed and in effect on October 29, 2021. The divestment was then effective from such date.

Barreirinhas AP1 Project

The Barreirinhas AP1 Project is located in the Barreirinhas Basin, offshore to the east of Brazil. The PTTEP Group holds participating interest of 25% in the project, with Shell Brasil Petroleo Ltda. as the operator. The project comprises 4 exploration block BAR-M-215, BAR-M-217, BAR-M-252, and BAR-M-254. The project is waiting for exploration wells drilling permit from the government.

Brazil BM-ES-23 Project

The Brazil BM-ES-23 Project is located in the Espirito Santo Basin, offshore to the east of Brazil. The PTTEP Group holds 20% stake in the project, with Petrobras as the operator. In 2021, the Brazil government approved the exploration phase extension to May 2022. The project is currently evaluating the geological study and petroleum potential for further development.

Mexico Block 12 (2.4) Project

Mexico Block 12 (2.4) is located in the Mexican Ridges, Western Gulf of Mexico. The PTTEP Group holds 20% participating interest in the project, with PETRONAS as the operator. The exploration well drilling was completed according to work commitment under the concession, with no petroleum potential confirmed.

Mexico Block 29 (2.4) Project

The Mexico Block 29 (2.4) Project is located in the Campeche basin, southern Gulf of Mexico. The PTTEP Group holds 16.67% participating interest in the project, with Repsol as the operator.

In 2021, the drilling plans for one appraisal well and one exploration well were approved by the Mexican government and the drilling of both wells were already been 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 Divestment and Relinquishment in 2021Potiguar Project

On July 30, 2021, the PTTEP Group signed a Sale and Purchase Agreement to sell its 100% interest in Partex Brasil Ltda., which holds 50% participating interest in the Potiguar Project. The transaction was completed and in effect on October 29, 2021.

PTTEP Australasia Project

On November 19, 2021, PTTEP Australasia (Ashmore Cartier) Pty Ltd had submitted the request for the relinquishment of AC/L3 Project in Australia, which will be effective after the official approval from the government.

Myanmar M11 project

On November 22, 2021, the Government of Myanmar approved the relinquishment of exploration blocks of Myanmar M11 project, with 100% participating interest, after fulfillment of the requirements of the Production Sharing Contract, that the relinquishment request was submitted in September 2019.

Myanmar MOGE 3 project

On November 24, 2021, the Government of Myanmar approved the relinquishment of exploration blocks of Myanmar MOGE 3 project, at 77.5% participating interest, after fulfillment of the requirements of the Production Sharing Contract, that the relinquishment request was submitted in July 2020.

(2) Midstream**PTT Global LNG Company Limited (PTTGL)**

PTTEP and PTT jointly established PTTGL on June 23, 2017 to carry out business related to Liquefied Natural Gas (LNG) value chain with equal shareholding at 50%. PTTEP is seeking investment opportunities in LNG as natural gas has seen the highest consumption growth, being the cleanest form of energy among fossil fuels, with an abundance of reserves globally.

In 2021, PTTGL obtained a Shipper License for importation and wholesale of natural gas from the Energy Regulatory Commission (ERC) according to Thailand's natural gas market liberalization policy. In addition, PTTGL participated and hold 50% interest in B.Grimm Power LNG JV Company Limited. This joint venture has the primary objective in sourcing and supplying LNG for B.Grimm Power Public Company Limited.

As of December 31, 2021, PTTGL had one LNG liquefaction project investment, a 10% share in PETRONAS LNG 9 Sdn. Bhd., a subsidiary of PETRONAS in Malaysia with 3.6 million tons per annum capacity (31.2 million barrels of oil equivalent).

Oman LNG (OLNG)

PTTEP by PTTEP Oman E&P Corporation (POC) formerly Partex Oman Corporation has a 2.0% stake in Oman LNG LLC (OLNG) which owns two 3.4 million tons per annum capacity liquefaction trains located near Sur, Oman. A third liquefaction train by a separate company, Qalhat LNG (QLNG) in which OLNG is a joint investor, has an additional capacity of 3.6 million tons per annum. The three trains have a combined nameplate capacity of 10.4 million tons per annum.

The LNG produced is sold into South Korea and Japan markets by existing long-term contracts (SPAs), due to be expired by end of 2024.

The partners in OLNG are the Government of Oman 51.0%, Shell 30.0%, Total 5.5%, Mitsubishi Corporation 2.8%, Mitsui & Co 2.8%, POC 2%, Korea Gas Corporation (KOGAS) 1.2%, Samsung 1.0%, Hyundai 1.0%, Daewoo International 1.0%, Itochu 0.9%, and SK Innovation 0.8%.

For QLNG, the partners are the Government of Oman 46.8%, Gas Natural Fenosa 7.4%, Mitsubishi Corporation 3.0%, Itochu 3.0%, Osaka Gas 3.0%, and OLNG at 36.8% which makes POC indirectly holds 0.736% in QLNG.

ADNOC Gas Processing (AGP)

PTTEP by PTTEP Gas Corporation (PGC) formerly Partex Gas Corporation owns 2% of ADNOC Gas Processing (AGP) with ADNOC, the national oil company of United Arab Emirates, owning a 68% stake and Shell and Total each holding 15%.

AGP, formerly known as GASCO prior to 2017, is an operating company engaged in processing associated and non-associated natural gas from UAE's onshore and offshore fields. Gas is supplied to AGP via pipelines from ADNOC's upstream entities; ADNOC Onshore (formerly ADCO), ADNOC Offshore (formerly ADMA), and other non-associated gas fields.

Associated gas supplied from ADNOC Onshore's oil fields is processed in Asab 0/3, Bab and Bu Hasa gas processing facilities. The AGP Joint Venture partners are entitled to the respective share of C3+, i.e. LPG (propane, butane) and paraffinic naphtha production from this associated gas until the concession ends in 2028.

(3) Gas Transportation Pipeline

PTTEP Offshore Investment Company Limited (PTTEPO), a wholly-owned subsidiary of PTTEP, has major investments in other companies, such as an 80% holding in Andaman Transportation Limited (ATL), 25.5% in Moattama Gas Transportation Company (MGTC), and 19.31784% in Taninthayi Pipeline Company (TPC). The objective of the Company is to invest in gas pipeline transportation of Zawtika, Yadana, and Yetagun projects connected at the border between Myanmar and Thailand.

(4) Jetty and Warehouse

Petroleum Development Support Base was established to provide jetty and warehouse services to support the PTTEP Group's offshore exploration and production activities both in Thailand and abroad. The Support Base mainly accommodates the Company's own offshore operating projects in Thailand, such as Bongkot Project, Arthit Project, G1/61 Project, G2/61 Project as well as those projects of other offshore oil and gas operating companies, such as PTT, Chevron Thailand Exploration and Production Limited, Carigali-PTTEPI Operating Company Sdn. Bhd. (CPOC), MP G11 (Thailand) Limited, and Mubadala Petroleum (Thailand) Limited. Moreover, the Support Base can also support affiliated offshore operating projects, such as Myanmar M3 Project and Zawtika Project, which are located in Myanmar. Currently, our Support Base operates at 2 branches in the provinces of Songkhla and Ranong.

1) *Petroleum Development Support Base (Songkhla Branch)* solely provides marine jetty berthing and warehousing services. It is owned and operated by PTTEP International Limited (PTTEPI), a subsidiary of PTTEP. The jetty is equipped with 380 meters of wharf, which is capable of simultaneously berthing six supply vessels with a size of more than 500

gross tons. The jetty is also equipped with storage facilities and operated with a high standard of material-handling equipment. The Support Base also operates under an international management system which focuses on safety and security while taking into account the issues of occupational health and the environment. It strictly follows the International Ship and Port Facility Security Code (ISPS Code) which has been approved by the Marine Safety and Environment Bureau of the Royal Thai Marine Department. The jetty is therefore recognized as one of the country's leading shore-based facilities for petroleum exploration and production activities. The 121-rai warehousing service facility is divided into 4 sections, namely the storage warehouse; open yard; free zone storage warehouse; and free zone yard for optimal storage of materials and equipment. This facility is also used for certain goods that have been granted tax and duty benefits in its duty-free areas.

2) *Petroleum Development Support Base (Ranong Branch)* provides marine jetty berthing and warehousing services. It is also owned and operated by PTTEPI through the jetty service, which is operated through Ranong's multi-purpose port, is owned by the Port Authority of Thailand. The jetty has a 150-meter wharf that is capable of simultaneously berthing 2 supply vessels with a size of more than 500 gross tons each. The Support Base is also fully equipped with storage facilities and standard material-handling equipment. The 25-rai warehousing service facility is divided into 4 sections, namely the storage warehouse; open yard; free zone storage warehouse; and free zone yard for optimal storage of materials and equipment. As well, this facility is for certain goods that have been granted tax and duty benefits in its duty-free areas.

To ensure that the services of both Support Base branches meet international standards and top safety levels, performance audits are continually conducted at both sites, emphasizing safety, security, occupational health, and the environment. Both are also operated by and equipped with high security systems, such as parameter and high mast lights, barbed-wire fencing, a CCTV system, and 24-hour security guards. PTTEP is also aware of its responsibilities to society and the environment, especially the local communities surrounding the Support Bases. The Company's efforts in this regard have resulted in several international accreditations including the International Environment Control Program (ISO 14001 certification), and the Occupational Health and Safety Management System (ISO 45001 certification). The Company has also prepared an Emergency Response Plan under the ISO 22301 standard to handle unexpected and emergency cases as well as to rehearse and exercise our response plans. This ensures that our Support Bases are capable of responding to emergency situations with the latest technologies and methods for continuity of the operation.

(5) Information Technology and Communication Services

PTT ICT Solutions Company Limited (PTT ICT), an affiliate of which 20% shares is owned by PTTEP, has signed an agreement with PTTEP to provide the Company with all information technology and communication services according to the resolution of PTTEP's Board of Directors Meeting No. 10/2549/254 on September 29, 2006. The agreement includes infrastructure design and implementation services, consultancy services, procurement services, and outsourcing services to support the Company's needs in information technology and communication, based on the PTT Group's ICT Policy Strategy for driving and increasing synergy within the group.

PTT ICT has re-registered its name with the Department of Business Development, Ministry of Commerce, to "PTT Digital Solutions Company Limited" since June 22, 2017. The current service contract is valid for five years, starting from January 1, 2021 onwards.

(6) Property Leasing

PTT and PTTEP have jointly established, constructed, and managed the Energy Complex Investment Project under Energy Complex Company Limited. The complex is considered to be the energy business center of the country, also comprising the Ministry of Energy, subsidiaries and associated companies of the PTT Group, as well as some private energy companies.

(7) Manpower Services

PTTEP Services Limited (PTTEP Services) was established in accordance with the resolution of PTTEP Board of Directors Meeting No. 12/2546/216. With its primary business objective to supply manpower to support the PTTEP Group's operational activities, the Company ensures that PTTEP is sufficiently staffed for both domestic and international expansion.

To fulfill this objective, PTTEP Services has recruited and hired various types of staff, such as specialists, engineers, operators, technicians, etc., both Thais and non-Thais, to serve PTTEP since July 1, 2004. The Company has continuously developed and improved its compensation, welfare, and benefits to ensure its staff are provided with fair compensation and good welfare and benefit programs that make them feel motivated. This has also helped to improve the Company's competitiveness in the market.

To enhance staff's capability to effectively support PTTEP operations, PTTEP Services has provided several training and development programs based on PTTEP's business requirements. The programs focus on compulsory Safety, Security, Health and Environment (SSHE) training, Functional Training as well as Soft Skill Training in areas of innovation and interpersonal skills. In addition, the Company has provided basic training, including English, digital and information technology courses to help the staff perform their job effectively.

PTTEP Services' business has continuously grown and expanded. Apart from supplying manpower for PTTEP, the Company has also provided manpower for Carigali-PTTEPI Operating Company Sdn. Bhd. (CPOC), a PTTEP joint venture company in Malaysia.

(8) AI and Robotics Technology

PTTEP incorporated AI and Robotics Ventures Company Limited (ARV) on September 21, 2018, as a wholly-owned subsidiary to serve as a platform for new innovations in the area of AI and Robotics. ARV aims to spearhead the advancement of technologies related to artificial intelligence and robotics and foster the next generation of tech-talent by providing a platform for systematic ideation and commercialization of ideas and technologies which deliver positive global impact. ARV aspires to make accessible technology advancements that support both Thai and Global economies by gradually expanding our footprint beyond national boundaries.

During 2021, after incubating homegrown technologies and business models through its innovation platform, ARV incorporated four subsidiaries on September 21, 2021. The subsidiaries include **Rovula (Thailand) Co., Ltd.**, a company specializing in subsea and marine services, utilizing proprietary artificial intelligence and robotics to provide advanced survey, inspection, repair, and maintenance services to the Oil & Gas sector and beyond; **Skyller Solutions Co., Ltd.**, a one-stop, hassle-free service for industrial inspection workflows covering data-acquisition to data-analytics and insightful visual-aided reports using its proprietary AI platform; **Varuna (Thailand) Co., Ltd.**, a combination of industry leading smart farming and smart forestry solutions using unmanned aerial systems, satellite technology, and a proprietary AI platform of visual analytics and

insights to help farmers achieve higher crop yields and help environmentalists achieve carbon reduction targets; **Cariva (Thailand) Co., Ltd.**, a unique health data network, utilizing technologies such as AI, IoT, cryptography, and new digital wallets, to enable individuals and businesses to derive value from health insights while strictly preserving personal data privacy. ARV's innovation platform comprises the fundamental supporting pillars to provide best-in-class shared services such as human resources, finance and accounting, procurement, and corporate governance.

In addition, ARV has also unveiled, "Horus", Thailand's first Unmanned Aerial Systems (UAS also commonly referred to as Drone) in-a-box. Horus is a fully automated drone solution capable of being installed at remote operating sites and carrying autonomous missions.

Moreover, ARV has leveraged its artificial intelligence and robotics technologies to promptly provide support to Thailand's COVID-19 aid initiatives to promote sanitization and provide aid and safety to frontline health personnel. For example, ARV supported the Ministry of Public Health with IoT Cold Chain monitoring devices to ensure the safe storage of COVID-19 vaccines at multiple sites nationwide. ARV has also donated robots such as Xterlizer, the autonomous/remote-operated ground vehicles equipped with UV-C disinfection bulbs, and Cara, a robot with transport trays that helps healthcare workers transport medical supplies and food around the hospital and can be controlled and operated wirelessly from a distance.

1.2.3 Research, Technology Development and Innovation

PTTEP researches and develops technology and innovations to support the Company's goals in sustainable development, aiming to be a high-performance organization and creating long-term value for stakeholders, whereby PTTEP applies the technology available in the market to maximize benefits and carries out research & development in new technologies. PTTEP has three main objectives in technology development:

- 1) To enhance petroleum exploration and production (E&P) business efficiency;
- 2) To minimize environmental impact;
- 3) To support the energy transition.

Technologies for Enhancing E&P Business Efficiency

Petroleum exploration and production business is a core business that is an important mission of PTTEP in ensuring energy security for the country. PTTEP applies technologies to increase efficiency in petroleum exploration and production with three goals which are increasing petroleum exploration success and petroleum reserves, enhancing petroleum production, and reducing production costs. The technology that has been researched and developed can be divided into six groups as follows:

1) Advanced Exploration Technology

In petroleum exploration, a seismic survey is normally used to obtain a geological model for data analysis and to assess the feasibility of petroleum resources. PTTEP has developed seismic survey data processing technology to obtain more accurate petroleum field data. This will result in increasing the success of petroleum exploration.

2) Enhanced Oil Recovery (EOR) Technology

In the crude oil production process, it is necessary to apply Enhanced Oil Recovery (EOR) technology to maximize petroleum recovery and increase crude oil production to meet the target. PTTEP has developed and tested various EOR technologies, such as chemical EOR, microbial EOR, nanotechnology EOR, etc., which these technologies have developed and aim to implement in the S1 onshore oil field.

3) Condensate Treatment Technology

In offshore petroleum production in the Gulf of Thailand, the petroleum product contains natural gas and condensate. For condensate, it must go through a treatment process to remove unwanted composition in order to make the products conform to the sales specification. Various condensate treatment technologies have been developed to increase efficiency and reduce costs, such as the development of chemical demulsifier to help accelerate the separation of unwanted composition in the form of particles, the development of adsorbent and filter, etc. In 2021, the Company successfully developed and tested condensate treatment technology in the Bongkot and Arthit fields and was able to achieve target to eliminate over 50% of the unwanted composition. In 2022, the Company plans to extend the implementation to other production fields and continually develop them to increase performance.

4) Subsea Pipeline Decommissioning Technology

Subsea Pipeline is a device used for transporting petroleum products between offshore platforms. Subsea pipelines that are no longer in use because production has depleted will require decommissioning operations. There are 2 main methods of decommissioning a subsea pipeline: totally remove and leave in place. The Decommissioning Environmental Assessment (DEA) and Best Practical Environmental Option (BPEO) considerations found that the leave-in-place approach would have less impact on the environment and scores higher in considering decommissioning options. However, the pipeline must be cleaned to reduce the contaminant to a value that does not affect the environment first and must be approved in the method of decommissioning by the government agency. Therefore, technologies have been developed by PTTEP to support petroleum pipeline decommissioning activities such as the development of chemicals for the removal of contaminant in petroleum pipelines, the development of an intelligent sampling device to take internal surface samples of petroleum pipelines, and the development of portable contaminant analyzers for on-site analysis without having to send them to an onshore laboratory. These technologies are innovations that help to increase efficiency and safety of subsea petroleum pipeline decommissioning operations and reduce the impact on the environment in the long run. In the fourth quarter of the year 2021, such technology has been applied in the Greater Bongkot North Field, and the performance is satisfactory. The team will bring the results of the test to improve and increase efficiency and expanding its use to support future petroleum pipeline decommissioning activities.

5) CO₂ Removal Technology

Gas produced from petroleum wells consists of several gases; Carbon Dioxide is one of the gases with a relatively high percentage of production in the Gulf of Thailand, which is a gas that cannot be used to generate electricity. Therefore, it must be separated and disposed at offshore production sites. PTTEP has developed technologies to increase the efficiency of Carbon Dioxide separation and reduce the loss of saleable gas, such as the development of CO₂ removal membrane technology, development of a low heating value flare tip that reduces the loss of natural gas used for combustion, development of advanced material (MOF) absorbents, etc.

6) Operational Efficiency Improvement Technology

Petroleum production operation includes activities in several areas, such as production operation, petroleum well drilling and well service, maintenance, and inspection of equipment in the production process. PTTEP has developed technologies to increase operational efficiency in many areas, such as the development of automated robots to be used for human work in production control and inspection, development of chemicals for the separation of water and crude oil, and development of devices for petroleum pipelines inspection to enable accurate measurements, etc.

Technology for Minimizing Environmental Impact

PTTEP's technology development for minimizing environmental impacts is consistent with PTTEP's sustainable development strategy in the Stakeholders Value Creation component in 3 aspects, including:

1) Greenhouse Gas Reduction

Global warming and climate change are important and urgent issues both nationally and globally. To support the greenhouse gas emission reduction strategy, PTTEP has set a target to reduce the intensity of greenhouse gas emissions by at least 25 percent from the 2012 base year by 2030 and promote research and development of technology to support the achievement of such goals, such as research and development of carbon capture and utilization technologies (Carbon Capture & Utilization: CCU). In 2021, the Company tested a prototype of a carbon nanotube production from flare gas unit at the S1 production site and conducting an engineering study to design a higher capacity unit. The construction is expected to be completed by 2022. In addition, the technology development of converting CO₂ to Carbonate-base intermediate chemical (Propylene Carbonate) in the prototype phase is also carried out.

2) Circular Model for E&P

For the technology to support the circular economy concept for petroleum exploration and production businesses, there are various researches and development projects which are being carried out such as the technology to convert sand from petroleum production (by-product) into Zeolite which is a valuable product and can be used in a variety of industries. This helps to reduce the amount of waste from petroleum production, which will be disposed of by landfill method. In addition, there is research and development on the use of rock and soil from the drilling process of production wells in petroleum fields or drilling cutting to produce construction materials and used in road constructions. In 2021, bricks made from drilled cutting were used to pave roads in the PTTEP Technology and Innovation Center (PTIC) and drilled cutting were used as materials for making asphalt roads in the PTTEP Technology and Innovation Center and the PTTEP Rapid Scale-up Center (RASC).

3) Ocean for Life

PTTEP aims to be a leader in the conservation and restoration of natural resources and marine ecosystems. To support such goals, the Company has researched and developed oceanographic buoys by developing buoys for measuring seawater quality powered by renewable energy and can send information and store data on the cloud so that relevant parties can use the data in study and research to optimize the marine environment to increase marine biodiversity. In 2021, this project successfully tested prototype equipment in the sea at Ko Mun Nai, Rayong Province and is in the process of developing a 2nd phase prototype model and planned to test in the sea again in early 2022. PTTEP has also researched and developed sensors to measure microplastics, which is currently an important problem of marine pollution. The developed sensor can be used to measure microplastics on-site without having to send samples to a laboratory for analysis, which reduces the time and greatly increases the convenience for operators. In 2021, the project was in the lab-scale testing phase and the sensor will be tested for further development as a prototype device in 2022.

Technology for Supporting Energy Transition

Energy transition or the transition from fossil fuels to renewable energy or alternative energy that reduces Carbon Dioxide emissions is a change that directly affects PTTEP's business operations. As for technology development, PTTEP has the preparedness to support the Company's business in order to be ready for such changes, by studying and developing alternative energy technologies such as solar energy, wind energy, ocean wave energy, future energy, and technologies for separating and using Carbon Dioxide to produce other forms of energy such as Hydrogen, Methanol, etc. In addition, the Company also established

the Green Power Technology Playground in the area of PTTEP Technology and Innovation Research Center (PTIC) as an area for clean energy technology experiments and testing and develop knowledge and extend the implementation of clean energy technology. It is a place for researchers, innovators, and people who are interested in clean energy technology, to be able to participate in learning, experimenting, testing, and developing prototype equipment, including building a pilot model of clean energy technology to lead to real application.

Technology Development Management

PTTEP has a technology management division specifically taking care of the management of the Company's technology development. Technology Development Process (TDP) is a framework for managing technology development for maximum efficiency. The process is divided into 5 phases of the technology development which are preliminary study, lab-scale testing, prototype development, pilot testing, and deployment or commercialization phase, which is consistent with the technology development at the international level, known as the Technology Readiness Level (TRL). The Technology Development Process is also a tool to assist in the selection and approval of projects, as well as to support the technology development project until it is successful and can be implemented or commercialized. The technology development is under supervision and advisory on overall management in accordance with the Company's direction and policy from the Technology Development Committee.

In addition, the Company has an Intellectual Property Management Process as a framework for systematic management and expert personnel to manage intellectual property works resulting from PTTEP's technological and innovation developments. Since PTTEP began to develop technology until 2021, PTTEP has had more than 136 invention patent applications filed in 20 countries around the world from development of more than 63 technologies and innovations.

PTTEP Technology and Innovation Center (PTIC)

PTTEP has established PTTEP Technology and Innovation Center (PTIC) on an area of over 44 rai in the Eastern Economic Corridor of Innovation (EECi) at Wangchan Valley, Rayong Province. In the area of PTIC, it currently consists of a pilot area building, unmanned aerial vehicle (UAV) test field, including equipment and laboratories for technology and innovation research and development. PTIC will play a key role in enhancing PTTEP's competitiveness by driving and accelerating the success of technology development and innovation towards faster industrial application. PTIC also plays an important role in the development of technology personnel of the nation. It is an area for exchanging knowledge of researchers and experts and building a research network internationally to help extend and drive sustainable technology development.

1.2.4 Permission to Operate, Concession, or Business Promotion

PTTEP operates petroleum exploration and production business in the Kingdom of Thailand and abroad. The Company's investments in foreign countries must comply with all applicable laws and regulations of those invested countries such as (1) Production Sharing Contract (2) Concession or (3) Services Agreement. Within the Kingdom of Thailand, the Company must comply with the Petroleum Act, B.E. 2514 and its amendments which set out the rights to explore, exploit, and produce petroleum under concession regime, production sharing contract regime, and services agreement regime. Key points in the petroleum business are as follows:

(1) Demarcation of Petroleum Exploration and Production Areas

The Department of Mineral Fuels, the Ministry of Energy, as the government authority under petroleum law, is responsible for demarcating each petroleum exploration and production area (Block) and inviting oil companies to submit their

applications requesting for awarding concession, production sharing contract, or services agreement. In considering any awards, the Petroleum Committee has a duty to render consultation to the Minister. The Minister, with the approval of the Cabinet, has the authority to sign the concession, production sharing contract, or services agreement to award the right to explore, exploit, and produce petroleum. Qualifications of each applicant will be considered by the State to award the right to explore, exploit, and produce petroleum which includes without limitation to the adequacy of the investment funds to be brought in and used in the exploration activities, transfer of knowledge and technology, employment of the Thai nationals, and the utmost benefits of the State.

(2) Characteristics of Joint Venturer

A petroleum concession, a production sharing contract, or a services contract may be awarded to a single concessionaire/contractor or multiple concessionaires/contractors. Since the risk of the petroleum exploration and production business is relatively high in its nature, it is common for concessionaires or contractors to form a joint venture in order to diversify such business risk. In a joint venture, a company will be designated as the “operator” to conduct the exploration and production operations on behalf of its partner(s) and commonly under the supervision of a management committee or an operating committee which is composed of representatives of all parties. Other non-operator companies will participate in making operational decisions, including technical, work program, and budget. The operator will cash call all parties to finance the project. Generally, whether any particular oil company will become a project operator depends largely on its investment conditions, readiness, and business strategy in that project.

(3) Nature of Operations and Investment Decisions

Before an oil company decides to invest in petroleum exploration in the Kingdom of Thailand or abroad, it has to consider the chance of having a successful exploration as well as other investment risk factors. A thorough study of the information available is conducted to determine whether the area has high petroleum potential and whether the project is commercially feasible. The success ratio of exploration wells in neighboring areas as well as other risk factors in the invested countries must also be considered. If the project is commercially feasible, the Company will apply for a right to explore, exploit, and produce petroleum or, if such right is already awarded, “farm-in” to the existing petroleum concession.

After the oil company is awarded a right to explore, exploit, and produce petroleum, an exploration program will be conducted, normally taking 2-3 years. If the petroleum reserves are found, the oil company will compare the amount of investment funds required for the development phase and the expected sales value of the petroleum based on the commercialized petroleum reserves. If the study indicates that the reserves are worth investing in as generally, this means that the petroleum field is considered to have commercial viability; a further investment onto development phase is therefore justified. The operator shall then apply for approval of petroleum production and simultaneously may start its production activity. The operator is still able to explore the rest of the existing areas if it is within the time frame of the exploration period as mentioned in the concession, the production sharing contract, or the services contract. At this stage, the operator must have a certain degree of confidence about the investment. However, as the investment expenditure required for such development phase is very high; the operator must normally be able to identify buyers of the petroleum in advance, whereas a long-term sales agreement for the petroleum to be produced shall be signed. Currently, PTT Public Company Limited (PTT) is the biggest petroleum buyer in Thailand. The principal elements of the sales agreement for petroleum generally include the determination method of the sales price and quantity of the petroleum to be delivered. Sales of natural gas from domestic areas are made at the wellhead, while sales of natural gas from foreign areas are made at the Thai borders. PTT is currently responsible for installation of

the most of the gas pipelines for the production amount as specified in the gas sales agreement. Sales of crude oil are made at the buyer's refinery, while sales of condensate are made at the Floating Storage Unit (FSU) near the wellhead.

(4) Description of Laws Relating to the Business

The operation of petroleum business in Thailand is governed by two major enactments, namely the Petroleum Act, B.E. 2514 and the Petroleum Income Tax Act, B.E. 2514 and its amendments. The concessionaire and contractor must be a limited company or a juristic person which has the same status as a limited company, established under the laws of Thailand or foreign laws. Several major features of these laws are as follows:

1) Concession

1.1) The concessionaire(s) and the co-venturer(s) shall pay the royalty which is normally in cash. The Minister may authorize such royalty payment in kind of petroleum with the prior notice of not less than 6 months. The royalty can be used as a credit against income tax (THAILAND I) or deducted as expenses (THAILAND III).

1.2) Petroleum income tax is prescribed at a rate not lower than 50% and not higher than 60% of the net profit from the petroleum operation.

1.3) Interest paid cannot be deducted as expenses for income tax purposes.

1.4) Each concessionaire could be awarded concessions with no limitation in terms of the number of blocks.

THAILAND I for the petroleum concessions awarded by the Ministry of Industry¹ from B.E. 2514 to B.E. 2532 and those onshore petroleum concessions issued before B.E. 2525

THAILAND II² for the onshore petroleum concessions awarded by the Ministry of Industry from B.E. 2525 to B.E. 2532

THAILAND III for the petroleum concessions awarded by the Ministry of Industry from B.E. 2533

¹ Currently, the Ministry of Energy

² Under Section 36 of the Petroleum Act (No. 4), B.E. 2532, all petroleum concessionaires under THAILAND II have applied to be subject to the criteria under THAILAND III.

Details of the Terms: THAILAND I, II, and III

Term	THAILAND I	THAILAND II	THAILAND III
Royalty Rates	12.5% of income from sales or disposal of petroleum which may be treated as tax credit	12.5% of income from sales or disposal of petroleum which may be treated as tax credit	progressive rate at sliding scale of 5-15%, deemed to be expenses which could be deducted in tax calculation
Petroleum Income Tax	50% of net profit from petroleum business operation	50% of net profit from petroleum business operation	50% of net profit from petroleum business operation
Special Benefits	-	annual benefits and annual production bonus	special remuneration benefit which could be deducted in tax calculation
Exploration Period	8 years with 4-year extension	8 years with 4-year extension	6 years with 3-year extension
Production Period	not exceeding 30 years from exploration's expiration date, with extension not exceeding 10 years	not exceeding 30 years from exploration's expiration date, with extension not exceeding 10 years	not exceeding 20 years from exploration's expiration date, with extension not exceeding 10 years
Concession Areas	not exceeding 10,000 sq. km. per exploration block, up to 5 exploration blocks	not exceeding 10,000 sq. km. per exploration block, up to 5 exploration blocks	not exceeding 4,000 sq. km. per exploration block, up to 5 exploration blocks ³

2) Production Sharing Contract

2.1) All petroleum operation expenditure shall be responsible by the contractor, whereas the contractor shall be recovered such expenditure by deducting from the production. The expenditure that can be deducted shall be the actual expenditure according to the work program and budget approved by the Director General of the Department of Mineral Fuels, the Ministry of Energy, but shall not exceed 50% of the overall production.

2.2) The contractor shall pay the royalty to the State at the rate of 10% of the overall production.

2.3) The remaining production after deducting the royalty and the recoverable expenditure shall be shared to the contractor, but not exceeding 50%.

2.4) Petroleum income tax is prescribed at a rate not lower than 20% of the net profit from petroleum operation.

3) Services Contract

3.1) Services contract can be either the hiring for exploration and production contract, the hiring for exploration contract, or the hiring for production contract.

³ Under Section 28 of the Petroleum Act (No. 6), B.E. 2550, effective on October 18, 2007, there is currently no limitation in terms of number of blocks.

3.2) The contractor shall be paid by the State according to the terms and conditions of each services contract.

3.3) All petroleum operation expenditure shall be responsible by the contractor.

3.4) Payment shall be made to the contractor after deducting the royalty.

At present, PTTEP has obtained the rights to explore, exploit, and produce petroleum in Thailand under concession and production sharing contract regime.

1.2.5 Market and Competition

PTTEP has invested in both domestic and overseas projects, including Myanmar, Vietnam, Malaysia, Indonesia, Australia, Canada, the United Mexico, Brazil, Algeria, Mozambique, Angola, Kazakhstan, UAE, and Oman. The target markets are both domestic and overseas where we have invested in. The Company's petroleum products include natural gas, crude oil, condensate, naphtha, and LPG.

In 2021, total sales by the Company and our subsidiaries averaged 416,141 barrels of oil equivalent per day (BOED). The total sales ratio of natural gas to liquid was 71% : 29% by volume and 56% : 44% by value, as shown below.

Product	Volume	Value (million USD)
Natural Gas	667,505 MMSCF or 108.35 MMBOE	3,701.35
Condensate	16.42 MMBBL	1,094.54
Naphtha	95,860 metric tons or 0.81 MMBOE	62.69
Crude Oil	25.75 MMBBL	1,716.64
LPG	67,735 metric tons or 0.56 MMBOE	30.75

(1) Marketing Characteristics

PTTEP sells our outputs from domestic and regional projects i.e. Myanmar and the Malaysia-Thailand Joint Authority (MTJA) primarily to the Thai market through PTT Plc. (PTT), the major buyer and processor of all the products. PTT then turns the processed products to the country's power sector, petrochemical industry sector, transportation sector, industry sector, and household sector.

The marketing of petroleum products varies with their characteristics and field location, which in turn differentiate the market and sales price structures.

1) Natural Gas

Due to capital-intensive investment in developing oil and gas exploration business, gas sales agreements (GSAs) must be agreed or signed between the buyer and seller before any major investment is made. GSAs are typically long-term contracts, ranging from 15 to 30 years. Prices, volumes, and points of sale are stipulated for each of the contracts. Currently, the designated transfer points for all domestically sold gas are at the Central Processing Platform (CPP), from which the buyer will invest in the transmission system to the CPP. The delivery point of the gas sold from the Republic

of the Union of Myanmar to Thailand is however at the Myanmar-Thai border. In this case, the seller is responsible for investment in the transmission pipelines from the CPP to the border. Gas prices are usually linked to fuel oil prices and several key economic indices as well as to reflect the investment costs and be competitive comparing with fuel oil for the GSA period.

Sales volumes are based on the assessed reserves on the negotiation date. GSAs stipulate obligations between buyer and seller for a committed volume. If the buyer does not take the volume of gas as committed to in the GSA, it must pay for the committed volume whether the gas is taken or not (Take-or-Pay). As a consequence, the buyer is entitled to take delivery of free of charge in subsequent years (Make-up Gas). On the other hand, should the seller fail to deliver as nominated by the buyer, the buyer is entitled to the agreed discount price of the undelivered volumes as stipulated in the agreement (Shortfall).

2) Condensate and Crude Oil

Condensate and crude oil prices are determined by their properties and benchmarked with crude oil prices of those predominantly sold in the region. Contracts are either short-term or long-term, and some are sold in spot markets.

3) Naphtha

Naphtha produced from ADNOC Gas Processing Project (AGP), the largest gas processing complex located onshore of Abu Dhabi, UAE, is sold by Abu Dhabi National Oil Company (ADNOC) which represents as Marketing Agent. Selling price followed official selling price in the region and naphtha is sold under short-term contract.

4) LPG

LPG produced from S1 Project is sold to PTT under a long-term contract with the price in line with the government's policy and announcements by the Joint Committee on Energy Policy Administration. Moreover, LPG produced from ADNOC Gas Processing Project (AGP), the largest gas processing complex located onshore of Abu Dhabi, UAE, is sold under a short-term contract the selling price of which refers to official selling price in the region.

Sales of petroleum products from PTTEP's international fields vary from country to country as follows:

- Zawtika, Yadana, and Yetagun projects in Myanmar: Approximately 79% of the produced natural gas from Zawtika and Yadana projects is primarily sold to Thailand through PTT, while the remaining 21% is sold to Myanmar which mainly use for its domestic power generation and small volume to industrial sector. Nearly all of the condensate from Yetagun Project in 2021 is sold in the regional spot markets due to the revamping of domestic refinery. All the gas output from Yetagun Project is currently sold to PTT for the consumption in Thailand.
- Vietnam 9-2 and Vietnam 16-1 projects in Vietnam: All of the oil output produced from both Vietnam 9-2 and Vietnam 16-1 projects are sold through auction in the regional short term and spot markets which major buyers are Binh Son Refining and Petrochemical Company Limited (BSR), a refinery in Vietnam, for the consumption in Vietnam and Trading Company. While the produced gas from both projects is sold to Vietnam Oil and Gas Group, a state enterprise, for the consumption in Vietnam.
- Algeria 433a & 416b Project in Algeria: The Bir Seba Field has commenced the production with its first commercial sales of crude oil since December 2015. The crude oil is sold through auction under a short-term contract which major buyer is the European's refineries.
- Potiguar Project in Brazil: A producing oil field in Brazil with production volume in 2020 around 150 barrels per day. The crude oil is sold under a short-term contract to domestic refinery. However, PTTEP has already divested this project in order to realign its business portfolio.

- Dunga Project in Kazakhstan: A producing oil field located onshore west of Kazakhstan is operated and sold by Total. The crude oil is sold under a short-term contract to both domestic and export markets.
- Block K, Block H, and the Sarawak SK 309 and SK 311 projects in Malaysia: Crude oil from Sarawak SK 309 and SK 311 Project, together with Kikeh, Siakap North-Petai (SNP), and Gumusut-Kakap (GK) fields from Block K Project, and Block H Project are sold under long-term contracts in Malaysia and in spot markets. Natural gas produced from the Sarawak SK 309 and SK 311, and Block H projects are sold under long-term contract to Petroliaam Nasional Berhad (PETRONAS), the Malaysia national oil company, and used as gas supply to the Petronas LNG Complex in Bintulu.

For MTJDA Project in Malaysia-Thailand Joint Development Area, the produced natural gas is sold to PTT for the consumption in Thailand. Starting from April 2015, the gas has been sold to Malaysia according to the Gas Balancing Agreement between PTT and PETRONAS. The condensate output meanwhile has been marketed and sold by a Co-Marketing Agent of PTT and PETRONAS Trading Corporation Sdn. Bhd. (PETCO) through auction in the spot markets.

(2) Competition

Thailand's E&P industry is oligopolistic due to the business' relatively high investment and advanced technology required. The growing demand especially for natural gas and the GSAs which are predominantly long-term contracts coupled with Take-or-Pay clauses, however, has continued to attract new investments to the market.

Previously, PTT had been designated as a sole gas buyer, whether from domestic supplies, Malaysia-Thailand Joint Development Area, Myanmar or LNG import, to fulfill Thailand's gas demand. This was until 2019 when Energy Regulatory Commission (ERC) started to grant LNG shipper licenses to other organizations, as a part of Thailand's policy on gas market liberalization. So far, 7 organizations, in addition to PTT, have been granted the licenses. However, the impact to PTTEP gas sales to PTT is expected to be minimal because the licenses allow only LNG import for additional volume over the committed gas sales in current GSAs, and current GSAs with PTT also have Take-or-Pay obligation as mentioned above.

Regarding the approximate domestic production in 2021, PTTEP's petroleum production accounts for 43% of the total domestic production in 2021, making the Company the leader among the domestic producers.

Producers	% Domestic Production Volume
PTTEP	43
Chevron	21
MOECO	6
PETRONAS	10
Total	9
Others	11

Source: Department of Mineral Fuels, Ministry of Energy (as of November 2021)

1.2.6 Production

(1) Exploration and Production Stages and Technology

Petroleum exploration and production can generally be divided into 4 major stages as follows:

- 1) Exploration stage: This is the first step to identify the areas with reservoir potential. The main activities conducted in this stage include:

- Primary geological and geophysical surveys
- Seismic acquisition, processing and interpretation
- Exploration well drilling and testing

2) Appraisal/Delineation stage: This stage mainly involves additional study to increase the certainty of estimated size and properties of the reservoirs. The main activities conducted in this stage include:

- Detailed study of petroleum geology and additional seismic survey (if any)
- Reservoir formation evaluation and conceptual development design
- Appraisal/Delineation well drilling and testing

3) Development stage: This is the last stage prior to the production. The main activities conducted in this stage include:

- Field development plan design and optimization
- Production facilities design, construction, and installation
- Development well drilling and completion

4) Production stage: This is the stage where petroleum and associated products flow through the pressure-controlled equipment (wellhead) and processing facilities, including measuring equipment, to obtain the production rates of all of the productions. The main activities conducted during this stage include:

- Monitoring of production rate, proportion between produced gas, crude oil or condensate, and water, as well as pressure decline rate
- Forecasting of the future reservoir performance
- Well intervention work-over and facilities maintenance

PTTEP has been well equipped in terms of manpower, technology, and equipment to operate the business efficiently according to the Company's target.

(2) Petroleum Reserves

Petroleum reserves can be divided into 2 categories, namely Proved Reserves and Unproved Reserves, according to the level of certainty.

1) Proved Reserves are 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.

Practically, Proved Reserves mean the petroleum in reservoirs that can be commercially produced based on supporting data gathered during the well testing process. In some cases, reserves may be classified as Proved Reserves essentially when the results from well logging and/or analyzing of the core and fluid samples can prove that the reservoirs and petroleum in the reservoirs are similar or comparable to those of the neighboring areas which have already been commercially produced or with the potential to be produced according to their well testing results. In addition, Proved Reserves must be able to be produced by using the existing production equipment or with the production equipment that has a firm plan to install in the future.

2) Unproved Reserves are defined based on geoscience and/or engineering data similar to that used in the estimation of Proved Reserves but with technical or other uncertainties which preclude such reserves from being categorized as Proved. Unproved Reserves can be further categorized into Probable Reserves and Possible Reserves as follows:

- Probable Reserves are those additional quantities of petroleum obtained from an analysis of geoscience and/or engineering data similar to that used in the estimation of Proved Reserves but with less production possibility.
- Possible Reserves are those additional quantities of petroleum obtained from an analysis of geoscience and/or engineering data similar to that used in the estimation of Probable Reserves but with less production possibility than both Proved Reserves and Probable Reserves.

The Company's Proved Reserves are composed and reviewed annually by our earth scientists and reservoir engineers to ensure the industry's rigorous professional standards.

The Proved Reserves are reported on a gross basis which includes the Company's net working interest and related host country's interest. As of December 31, 2021, the total amount of Proved Reserves of PTTEP Group's projects⁴ was 357 million stock-tank barrels (MMSTB) of crude oil and condensate⁵ and 5,973 billion standard cubic feet (BSCF) of natural gas or 993 million barrels of oil equivalent (MMBOE). The total amount of Proved Reserves in terms of oil equivalent was therefore 1,350 MMBOE. Details of the Company's Proved Reserves are shown in the following table.

⁴ Include APICO Joint Venture project

⁵ Include NGL

PTT Exploration and Production Public Company Limited

Crude, Condensate and Natural Gas Proved Reserves¹As of December 31st, 2021

	Crude and Condensate ²			Natural Gas			Barrel of Oil Equivalent		
	(Million Barrels)			(Billion Standard Cubic Feet)			(Million Barrel of Oil Equivalent)		
	Domestic	Foreign	Total	Domestic	Foreign	Total	Domestic	Foreign	Total
<i>Company's share of reserves of consolidated companies</i>									
Proved Reserves as of Dec 31 st , 2020	112	183	295	2,580	2,171	4,751	533	540	1,073
1) Revision of previous estimates	7	4	11	51	(25)	26	15	2	17
2) Improved recovery	2	-	2	2	-	2	3	-	3
3) Extensions and discoveries	20	8	28	781	48	829	147	15	162
4) Purchases/Sales of petroleum in place	-	69	69	-	1,117	1,117	-	264	264
5) Production	(26)	(22)	(48)	(470)	(342)	(812)	(103)	(76)	(179)
Proved Reserves as of Dec 31 st , 2021	115	242	357	2,944	2,969	5,913	595	745	1,340
<i>Company's share of reserves of equity companies</i>									
Proved Reserves as of Dec 31 st , 2020	0	-	0	9	-	9	1	-	1
1) Revision of previous estimates	(0)	-	(0)	(3)	-	(3)	(0)	-	(0)
2) Improved recovery	-	-	-	-	-	-	-	-	-
3) Extensions and discoveries	0	-	0	63	-	63	11	-	11
4) Purchases/Sales of petroleum in place	-	-	-	-	-	-	-	-	-
5) Production	(0)	-	(0)	(9)	-	(9)	(2)	-	(2)
Proved Reserves as of Dec 31 st , 2021	0	-	0	60	-	60	10	-	10
Total Proved Reserves as of Dec 31st, 2021	115	242	357	3,004	2,969	5,973	605	745	1,350

¹ The Proved Reserves are reported on a gross basis which includes the Company's net working interest and the related host country's interest.² Natural Gas Liquids (NGL) included.

Furthermore, in order to improve efficiency, check and balance of the reserves estimation, reporting and disclosure, the Company maintains a Reserves Committee which has the following roles and responsibilities:

- Review and endorse the Company's Annual Reserves
- Review and approve Major Changes of Reserves, and Reserves for Newly-Acquired Project
- Ensure that all activities that related to reserves estimation and disclosure of reserves information

conform to regulatory and legal requirements as well as to corporate and international standards

- Approve Annual Reserves Audit Plan, appoint Reserves Auditor, as well as approve Reserves Audit Report to ensure compliance with the Company's framework and continual process improvement.

(3) Petroleum Production

In 2021, the total production of PTTEP Group¹ was 181 MMBOE, consisting of 48 MMSTB of crude oil and condensate² and 821 BSCF (133 MMBOE) of natural gas. This was equivalent to the average production rate of 494,877 barrels of oil equivalent per day (BOED) which was approximately 72,599 BOED or 17% increase from the previous year. The increase in production mainly comes from the production of the newly acquired Oman Block 61 Project participating 20% in 2021, and the first production from Rotan and Buluh offshore gas fields in Sabah, Malaysia Project.

1.2.7 PTTEP and Our Subsidiaries' Assets

(1) Property, Plant and Equipment

Oil and Gas Properties

PTTEP and our subsidiaries' properties are mainly jointly controlled oil and gas properties in each project. These properties comprise land, buildings, construction, machine and equipment, transportation pipeline, capitalized exploratory and production drilling costs, decommissioning costs, which are estimated by PTTEP Group's engineers and management's judgment, and acquisition costs of concession right, which shall incur when PTTEP and our subsidiaries acquire the concession right.

As of December 31, 2021, PTTEP and our subsidiaries' oil and gas properties are represented as share of the joint ventures' individual assets for each project. The details of share of the joint ventures in the project are disclosed in Part 3 Financial Report in Notes to the Consolidated and Separate Financial Statements No. 16 Investments in subsidiaries, associates, joint ventures, and joint operations.

¹ Include APICO Joint Venture Project

² Include NGL

As of December 31, 2021, details of properties' net book value are as follows:

Unit: Million US Dollar

Details of properties	Historical cost	Accumulated depreciation	Allowance for impairment of assets	Net book value
Oil and Gas Properties	31,583	(23,367)	(361)	7,855
Exploration and Evaluation Assets	4,446	-	(1,325)	3,121
Right-of-use Assets	716	(196)	-	520
Goodwill	2,016	-	(275)	1,741
Pipeline and Others	1,334	(595)	(11)	728
Assets under Construction	2,932	-	-	2,932
Total	43,027	(24,158)	(1,972)	16,897

(2) Investments

Details of PTTEP's subsidiaries, associates, joint ventures, and joint operations are disclosed in Part 3 Financial Report in Notes to the Consolidated and Separate Financial Statements No. 16 Investments in subsidiaries, associates, joint ventures, and joint operations.

(3) Net Book Value

As of December 31, 2021, PTTEP's net book value amounted to USD 12,428 million (equivalent to THB 415,350 million) or USD 3.13 per share (equivalent to THB 104.62 per share).

1.2.8 Backlogs

-None-

1.3 Shareholding Structure of PTTEP Group

(1) Operational Policy of PTTEP Group

PTTEP has continuously expanded our E&P business, including in related businesses and Non E&P, domestically and internationally. The establishment of subsidiaries and/or associated companies in various regions is necessary for investment purposes, improving our operational efficiency, competing with other international oil companies, operational flexibility, and adjusting to global economic changes. Several factors, such as laws and regulations, financial structures, tax regimes, business and investment conditions, and risk management, should be taken into consideration in any decision to set up a subsidiary or an associated company.

It is our policy to manage PTTEP's subsidiaries in line with PTTEP's business direction and strategy. We designate PTTEP executives and staff to second into key positions of PTTEP's subsidiaries. The strategic direction and financial investment of PTTEP's subsidiaries are overseen by the Company. The boards of directors of the subsidiaries, especially the Non E&P business, e.g. ARV, have the business management decision authority on the paths to achieve the set targets and strategy. As for the associated companies, we nominate PTTEP representatives to serve as shareholders and/or members of the Board of Directors in accordance with the terms of investment, in order to take part in the decision-making of the overall business strategy and policy of these companies. To manage both the subsidiaries and associated companies, we adhere to the Good

Corporate Governance and Business Ethics of the PTTEP Group, in order to ensure effectiveness, transparency, fairness, and the attainment of our business goals.

With respect to the selection of directors of the Company's subsidiaries and associated companies, we designate PTTEP executives responsible for projects under each relevant subsidiary and associated company as directors of these entities to ensure that they are managed in line with the Company's business direction and strategy. We may also appoint a local director, if required by the domestic laws and regulations or investment conditions. The subsidiaries and associated companies meanwhile are obligated to report their performance to the Company on a quarterly basis in order to ensure their performance and effectiveness.

(2) Shareholding Structure of PTTEP Group

As of December 31, 2021, PTTEP invested in 111 legal entities, comprising 86 subsidiaries and 25 associated companies. The PTTEP Group Shareholding Structure is illustrated as below:



Notification of the Securities and Exchange Commission Kor Chor. 17/2551 Determination of Definitions in Notifications relating to Issuance and Offer for Sale of Securities

(3) Information of PTTEP

Company Name	PTT Exploration and Production Public Company Limited or PTTEP
Headquarters Address	555/1 Energy Complex Building A, 6 th and 19 th -36 th Floor, Vibhavadi Rangsit Road, Chatuchak, Chatuchak, Bangkok 10900, Thailand
Type of Business	Exploration and production of petroleum and investments in related businesses
Registration Number	0107535000206
Telephone	+66-2537-4000
Facsimile	+66-2537-4444
Website	www.pttep.com
E-mail	Independent Directors: independentdirector@pttep.com Investor Relations: ir@pttep.com Corporate Secretary: corporatesecretary@pttep.com
Registered Capital	3,969,985,400 ordinary shares with THB 1 per share (THB 3,969,985,400)
Paid-Up Capital	3,969,985,400 ordinary shares with THB 1 per share (THB 3,969,985,400) as of December 31, 2021

(4) Subsidiaries and Associated Companies Information

● Subsidiaries Information¹

As of December 31, 2021, there were 86 subsidiaries that have the same contact address, telephone, and facsimile numbers as PTTEP as in 1.3 (3) Details of the directors designated by the PTTEP Group for each subsidiary are disclosed in Attachment 2 as follows:

No.	Company Name	Abbreviation	Number of Shares Sold	Total Direct/ Indirect Holding
E&P				
1	PTTEP Australia Pty Ltd	PTTEP AU	50,000	PTTEPH 100%
2	PTTEP Australia Offshore Pty Ltd	PTTEP AO	50,000	PTTEP AU 100%
3	PTTEP Australia Perth Pty Ltd	PTTEP AP	50,000	PTTEPH 100%
4	PTTEP Australia Browse Basin Pty Ltd	PTTEP AB	50,000	PTTEP AP 100%
5	PTTEP Australasia (Staff) Pty Ltd	PTTEP AAS	10	PTTEP AB 100%
6	PTTEP Australasia (Ashmore Cartier) Pty Ltd	PTTEP AAA	1,700,000	PTTEP AB 100%
7	PTTEP Australasia (Operations) Pty Ltd	PTTEP AAO	106,686,517	PTTEP AB 100%
8	PTTEP Australia Timor Sea Pty Ltd	PTTEP AT	50	PTTEP AB 100%
9	PTTEP Sabah Oil Limited	PTTEP SBO	10,000	PTTEP HKO 100%
10	PTTEP Sarawak Oil Limited	PTTEP SKO	10,000	PTTEP HKO 100%
11	PTTEP Brasil Investimentos Em Exploração e Produção de Petróleo e Gás Ltda.	PTTEP BL	790,293,700	PTTEP BI 99.99999999% PTTEP NH 0.0000001%
12	PTTEP Canada Limited	PTTEP CA	3,100,812,390	PTTEP NC 100%
13	Cove Energy East Africa Limited	CEEAL	1,000	Cove 100%
14	PTTEP Mozambique Area 1 Limited	PTTEP MZA1	1,000	CEEAL 100%
15	PTTEP FLNG Holding Company Limited	PTTEP FH	10,000	PTTEP IH 100%
16	PTTEP HK Holding Limited	PTTEP HK	10,000	PTTEP 25% PTTEPI 75%

¹ Notification of the Securities and Exchange Commission No. Kor Chor. 17/2551 Re: Determination of Definitions in Notifications relating to Issuance and Offer for Sale of Securities

No.	Company Name	Abbreviation	Number of Shares Sold		Total Direct/ Indirect Holding	
17	PTTEP HK Offshore Limited	PTTEP HKO	10,000	Ordinary Share	PTTEP HK	100%
18	PTTEP MENA Limited	PTTEP MENA	500	Ordinary Share	PTTEP BC	100%
19	PTTEP Offshore Investment Company Limited	PTTEPO	6,667	Ordinary Share	PTTEP PTTEPI	75% 25%
20	PTTEP Holding Company Limited	PTTEPH	50,000	Ordinary Share	PTTEPO	100%
21	Sinphuhorm Holdings Limited	SHL	100	Ordinary Share	PTTEPO	100%
22	PTTEP International Holding Company Limited	PTTEP IH	50,000	Ordinary Share	PTTEPH	100%
23	PTTEP Africa Investment Limited	PTTEP AI	50,000	Ordinary Share	PTTEPH	100%
24	JV Marine Limited	JV Marine	50,000	Ordinary Share	PTTEP IH	100%
25	PTTEP Netherland Holding Limited	PTTEP NL	50,000	Ordinary Share	PTTEP IH	100%
26	PTTEP Indonesia Company Limited	PTTEP ID	50,000	Ordinary Share	PTTEPH	100%
27	PTTEP Sadang Limited	PTTEP SD	50,000	Ordinary Share	PTTEP ID	100%
28	PTTEP South Mandar Limited	PTTEP SMD	50,000	Ordinary Share	PTTEP ID	100%
29	PTTEP South Sageri Limited	PTTEP SS	50,000	Ordinary Share	PTTEP ID	100%
30	PTTEP Malunda Limited	PTTEP ML	50,000	Ordinary Share	PTTEP ID	100%
31	PTTEP Algeria Company Limited	PTTEP AG	50,000	Ordinary Share	PTTEPO	100%
32	PTTEP Hoang-Long Company Limited	PTTEP HL	50,000	Ordinary Share	PTTEPO	100%
33	PTTEP Hoan-Vu Company Limited	PTTEP HV	50,000	Ordinary Share	PTTEPO	100%
34	PTTEP Kim Long Vietnam Company Limited	PTTEP KV	50,000	Ordinary Share	PTTEPO	100%
35	PTTEP Southwest Vietnam Company Limited	PTTEP SV	50,000	Ordinary Share	PTTEPO	100%
36	PTTEP South Asia Limited	PTTEP SA	50,000	Ordinary Share	PTTEPH	100%
37	Partex (Brazil) Corporation	PBC	50,000	Ordinary Share	PGH	100%
38	PTTEP (Kazakhstan) Corporation	PKC	500	Ordinary Share	PGH	100%
39	PTTEP (Angola) Corporation	PANG	50,000	Ordinary Share	PGH	100%

No.	Company Name	Abbreviation	Number of Shares Sold		Total Direct/ Indirect Holding	
40	PTTEP Mexico E&P Limited, S. de R.L. de C.V.	PTTEP MEP	3,000	Ordinary Share	PTTEP HK PTTEP HKO	99.99% 0.01%
41	Carigali-PTTEPI Operating Company Sdn. Bhd.	CPOC	350,000	Ordinary Share	PTTEPI	50%
42	PTTEP Netherlands Coöperatie U.A.	PTTEP NC	-	-	PTTEP IH PTTEP NL	0.00002% 99.99998%
43	PTTEP Netherlands Holding Coöperatie U.A.	PTTEP NH	-	-	PTTEP HK PTTEPI	75% 25%
44	PTTEP Brazil Investment B.V.	PTTEP BI	50,000	Ordinary Share	PTTEP NH	100%
45	Natuna 2 B.V.	Natuna	90,000	Ordinary Share	PTTEP NH	50%
46	PTTEP Group Holding B.V.	PGH	100,000	Ordinary Share	PTTEP HK	100%
47	Participations and Explorations Corporation	PEC	20,000	Ordinary Share	PGH	100%
48	PTTEP Oman E&P Corporation	POC	2,500	Ordinary Share	PGH	100%
49	PTTEP Gas Corporation	PGC	2,000,000	Ordinary Share	PGH	100%
50	Partex Services Corporation	PSC	3,000	Ordinary Share	PGH	100%
51	Partex Services Portugal – Serviços para a Indústria Petrolífera, S.A.	PSP	50,000	Ordinary Share	PSC	100%
52	PTTEP International Limited	PTTEPI	2,000,000,000	Ordinary Share	PTTEP	100%
53	PTTEP Siam Limited	PTTEPS	1,000,000	Ordinary Share	PTTEP PTTEPO	51% 49%
54	Orange Energy Limited	Orange	1,000,000	Ordinary Share	PTTEPO	53.9496%
55	PTTEP G7 Limited	PTTEP G7	8,030,741	Ordinary Share	PTTEPI	100%
56	PTTEP Energy Holding (Thailand) Company Limited	PTTEP EH	451,833,873	Ordinary Share	PTTEP	100%
57	PTTEP Energy Development Company Limited	PTTEP ED	151,616,552	Ordinary Share	PTTEP EH	100%
58	EP-Tech Ventures Holding Company Limited	EP-Tech	15,696,250	Ordinary Share	PTTEP EH	100%
59	APICO (Khorat) Limited	APICO KL	5,885,168	Ordinary Share	APICO KH	100%
60	Cove Energy Limited	Cove	63,840,000	Ordinary Share	PTTEP AI	100%

No.	Company Name	Abbreviation	Number of Shares Sold		Total Direct/ Indirect Holding	
61	PTTEP SP Limited	PTTEP SP	61,279,587	Ordinary Share	SHL	100%
62	APICO LLC	APICO	338,278	Ordinary Share	PTTEP SP PTTEP HK	33.83% 38.99%
63	APICO Khorat (Holdings) LLC	APICO KH	-	-	APICO	100%
E & P Related						
64	PTTEP Services Limited (Personnel services support)	PTTEP Services	1,000,000	Ordinary Share	PTTEP PTTEPI	25% 75%
65	Andaman Transportation Limited (Investments in gas pipeline projects in Myanmar)	ATL	62,500	Ordinary Share	PTTEPO	80%
66	PTTEP Southwest Vietnam Pipeline Company Limited (Investments in gas pipeline projects in Vietnam)	PTTEP SVPC	50,000	Ordinary Share	PTTEPH	100%
67	PTTEP Canada International Finance Limited (Raise fund for PTTEP business)	PTTEP CIF	62,202,800	Ordinary Share	PTTEP NC	100%
68	PTTEP Treasury Center Company Limited (Treasury center for PTTEP and subsidiaries)	PTTEP TC	10,000,000	Ordinary Share	PTTEP PTTEPI	25% 75%
69	PTTEP Business Center Company Limited (Business center for PTTEP and subsidiaries)	PTTEP BC	2,845,110,710	Ordinary Share	PTTEP EH	100%
70	Asia Power and Transportation SG Holding Pte. Ltd. (Investments in power and gas pipeline projects for overseas projects)	APT	50,000	Ordinary Share	EP-Tech	100%
71	Delta Gas Transportation SG Holding Pte. Ltd. (Investments in gas pipeline projects for overseas projects)	DGH	50,000	Ordinary Share	APT	100%
72	Delta Gas Transportation Limited (Investments in gas pipeline projects for overseas projects)	DGT	50,000	Ordinary Share	DGH	100%
Other Businesses						
73	AI and Robotics Ventures Company Limited (Research and development and providing service for AI and robotics)	ARV	15,006,250	Ordinary Share	EP-Tech	100%

No.	Company Name	Abbreviation	Number of Shares Sold		Total Direct/ Indirect Holding	
74	Energy Complex Company Limited (Property leasing)	EnCo	180,000,000	Ordinary Share	PTTEP	50%
75	PTT Global LNG Company Limited (Investment in LNG business)	PTTGL	10,421,446,000	Ordinary Share	PTTEP BC	50%
76	PTTGL Investment Limited (Investment in LNG business)	PTT GLI	309,825,000	Ordinary Share	PTTGL	100%
77	Mungalalu Truscott Airbase Pty Ltd (Air base operations)	MTA	600	Ordinary Share	PTTEP AAO	50%
78	Troughton Island Pty Ltd [Air base (Secondary)]	TTI	100	Ordinary Share	PTTEP AAO	50%
79	ATI Technologies Company Limited (Development and provision of technologies for the agricultural sector)	ATi	20,000,000	Ordinary Share	ARV	50%
80	ZeaQuest Company Limited (Development and provision of AI and robotic technologies for subsea engineering)	ZeaQuest	5,000,000	Ordinary Share	ARV	50%
81	Rovula (Thailand) Company Limited (Development and provision of AI and robotic technologies for exploration of undersea environment and maintenance of undersea facilities)	Rovula	100,000	Ordinary Share	ARV	100%
82	Varuna (Thailand) Company Limited (Development and provision of drone services, AI and robotic technologies for agriculture, and forestry)	Varuna	100,000	Ordinary Share	ARV	100%
83	Skyller Solutions Company Limited (Development and provision of drone services, AI and robotic technologies for air logistics)	Skyller	100,000	Ordinary Share	ARV	100%
84	Cariva (Thailand) Company Limited (Development and provision of AI and robotic technologies for personal health, safety and exercise)	Cariva	100,000	Ordinary Share	ARV	100%

No.	Company Name	Abbreviation	Number of Shares Sold		Total Direct/ Indirect Holding	
85	FutureTech Energy Ventures Company Limited (Renewable energy business and various forms of power)	FEV	730,000	Ordinary Share	EP-Tech	100%
86	FutureTech Solar (Thailand) Company Limited (Renewable energy business and electric power)	FST	670,000	Ordinary Share	EP-Tech	100%

● Associated Companies' Information¹

As of December 31, 2021, PTTEP had 25 associated companies as follows:

No.	Company Name	Type of Business	Abbreviation	Number of Shares Sold		Total Direct/ Indirect Holding
1	Hoang Long Joint Operating Company Head Office: Suite 2001, Me Linh Point Tower, 2 Ngo Duc Ke Street, District 1, Ho Chi Minh City, S.R. Vietnam Telephone: +84-8-3829-9359 Facsimile: +84-8-3822-6106	Petroleum Exploration and Production	HL JOC	² -	-	PTTEP HL 28.5%
2	Hoan-Yu Joint Operating Company Head Office: Suite 2006, Me Linh Point Tower, 2 Ngo Duc Ke Street, District 1, Ho Chi Minh City, S.R. Vietnam Telephone: +84-8-3823-9525 Facsimile: +84-8-3823-9526	Petroleum Exploration and Production	HV JOC	³ -	-	PTTEP HV 25%
3	Groupement Bir Seba Head Office: Zone d'activité Route Nationale N°3 BP 256 EURO JAPAN Hassi Messaoud, Ouargla, Algeria Telephone: +213-29-79-71-66 Facsimile: +213-29-79-09-15	Petroleum Exploration and Production	GBRS	⁴ -	-	PTTEP AG 35%

¹ Notification of the Securities and Exchange Commission No. Kor Chor. 17/2551 Re: Determination of Definitions in Notifications relating to Issuance and Offer for Sale of Securities

² No share was issued. Percentage of shareholding is subject to participation interest in the concession.

³ No share was issued. Percentage of shareholding is subject to participation interest in the concession.

⁴ No share was issued. Percentage of shareholding is subject to participation interest in the concession.

No.	Company Name	Type of Business	Abbreviation	Number of Shares Sold	Total Direct/ Indirect Holding
4	B8/32 Partners Limited Head Office: 19 Siam Commercial Bank Park Plaza, East 3 rd Building 5 th Floor, Ratchadaphisek Road, Chatuchak, Bangkok 10900, Thailand Telephone: +66-2545-5555 Facsimile: -	Petroleum Exploration and Production	B8/32 Partners	110,000	PTTEPO 25.001%
5	Petroleum Development Oman LLC Head Office: Mina A1 Fahal, Muscat, The Sultanate of Oman Telephone: +968-2467-8111 Facsimile: 5212, Petro ON Cable: Petro Muscat	Petroleum Exploration and Production	PDO	1,720	POC 2%
6	Petroleum Development Oman Services LLC Head Office: Al Qurm, Bousher, Muscat Governorate P.O. Box 81, Oman, Postal Code 100 Telephone: +968-9274-4696 Facsimile: -	Petroleum Technical Service	PDO-S	500,000	PDO 99.99 %
7	Gas Investments and Services Company Limited Head Office: 3 rd Floor, The Continental Building, 25 Church Street, Hamilton HM 12, Bermuda Telephone: - Facsimile: -	Financial Investment and Petroleum Technical Service in Oman Gas Project	GISCO	12,000	POC 5%

No.	Company Name	Type of Business	Abbreviation	Number of Shares Sold		Total Direct/ Indirect Holding
8	Private Oil Holdings Oman Limited Head Office: 8 York Road, London, England, SE1 7NA, UK Telephone: - Facsimile: -	Holding of Participating Interests in Oil and Gas	POHOL	649,152	Ordinary Share	POC 5%
9	B.Grimm Power LNG JV Company Limited Head Office: 5 Krungthep Kreetha Road, Hua Mak Sub-District, Bang Kapi District, Bangkok, Thailand Telephone: - Facsimile: -	Financial Investment in LNG Value Chain Business	BGJV	500,000	Ordinary Share	PTTGL 50%
10	PETRONAS LNG 9 SDN. BHD. Head Office: Tower 1, PETRONAS Twin Towers, Kuala Lumpur City Centre, 50088 Kuala Lumpur, Malaysia Telephone: +60-320-515-000 Facsimile: -	LNG Liquefaction Plant	PL9SB	39,563	Ordinary Share	PTT GLI 10%
11	Oman LNG LLC Head Office: Ghala, P.O. Box 560, C.P.O, P.C. 116, The Sultanate of Oman Telephone: +968-2460-9999 Facsimile: +968-2462-5406	LNG Liquefaction Plant	OLNG	1,209,877	Ordinary Share	POC 2%

No.	Company Name	Type of Business	Abbreviation	Number of Shares Sold		Total Direct/ Indirect Holding
12	QALHAT LNG SAOC Head Office: Al Arfan Street, Gala Industrial Area – P.O. Box:3395, P.C.: 111 99 Street, Airport Heights, Ghala, Baushar, The Sultanate of Oman Telephone: +968-2462-5400 Facsimile: +968-2462-5406	LNG Liquefaction Plant	QLNG	1,795,000	Ordinary Share	OLNG 36.8%
13	Abu Dhabi Gas Industries Limited Head Office: P.O. Box 665, Abu Dhabi, United Arab Emirates Telephone: +971-2707-0000 Facsimile: +971-2602-3389	Gas Processing Facility	AGP	8,000	Ordinary Share	PGC 2%
14	Moattama Gas Transportation Company Head Office: No. 5 Sacred Tooth Relic, Lake Avenue, Punn Pin Gone Quarter No. 5, Mayangon Township, Yangon, Myanmar Telephone: +95-1-650-977, 660-466 Facsimile: +95-1-650-478, 650-479	Gas Pipeline in Myanmar	MGTC	1,000,000	Ordinary Share	PTTEPO 25.5%
15	Taninthyai Pipeline Company LLC Head Office: 16 Shwe Taung Kyar Bahan, Yangon, Myanmar Telephone: +95-1-526-411-4 Facsimile: +95-1-525-698	Gas Pipeline in Myanmar	TPC	100,000	Ordinary Share	PTTEPO 19.31784%

No.	Company Name	Type of Business	Abbreviation	Number of Shares Sold		Total Direct/ Indirect Holding
16	Mozambique LNG 1 Company Pte. Ltd. Head Office: 50 Raffles Place #06-00 Singapore Land Tower, Singapore 048623 Telephone: - Facsimile: -	Petroleum Exploration and Production	MZ LNG1	2,500	Ordinary Share	MOZ LNG1 Holding 100%
17	MOZ LNG1 Holding Company Ltd. Head Office: 3412 ResCo-work08, 34 Al Maqam Tower, ADGM Square, Al Maryah Island, Abu Dhabi, United Arab Emirates Telephone: - Facsimile: -	Petroleum Exploration and Production	MOZ LNG1 Holding	1,000,000	Ordinary Share	PTTEP MZA1 8.5%
18	MOZ LNG1 Financing Company Ltd. Head Office: 3510, 35 th Floor, Al Maqam Tower, ADGM Square, Al Maryah Island, Abu Dhabi, United Arab Emirate Telephone: - Facsimile: -	Financial Investment in Mozambique Project	MOZ LNG1 Financing	140,000,000	Ordinary Share	MOZ LNG1 Holding 100%
19	MOZ LNG1 Co-Financing Company, LDA Head Office: Moçambique, Cidade de Maputo, DISTRITO KAMPFUMO, Bairro de Sommerschild, Avenida Julius Nyerere, n.º 3412 Telephone: - Facsimile: -	Financial Investment in Mozambique Project	Moz LNG1 Co-Financing	1,000,000	Ordinary Share	MOZ LNG1 Holding 100%

No.	Company Name	Type of Business	Abbreviation	Number of Shares Sold		Total Direct/ Indirect Holding
20	Leismer Aerodrome Limited Head Office: 1200, 215 – 9 th Avenue SW Calgary, AB T2P 1K3, Canada Telephone: +1-403-237-8227 Facsimile: +1-403-264-4640	Air Base Operations	LAL	200	Ordinary Share	PTTEP CA 32%
21	Erawan 2 FSO Pte. Ltd. Head Office: 3 Fraser Street #12-28 Duo Tower, Singapore Telephone: - Facsimile: -	Lease of FSO (Vessel)	E2FSO	100	Ordinary Share	JV Marine 13.11%
22	Asia Pacific Marine Services (EF) B.V. Head Office: Naritaweg 165, Telestone 8, 1043 BW Amsterdam, The Netherlands Telephone: - Facsimile: -	Lease of FSO (Vessel)	Asia Pacific Marine Services	18,000	Ordinary Share	E2FSO 100%
23	PTT Digital Solutions Company Limited Head Office: 555/1 Energy Complex Building A, 4 th -5 th Floor, Vibhavadi Rangsit Road, Chatuchak, Chatuchak, Bangkok 10900, Thailand Telephone: +66-2537-3456 Facsimile: +66-2537-2935	Information Technology and Communication Services	PTT Digital	15,000,000	Ordinary Share	PTTEP 20%

No.	Company Name	Type of Business	Abbreviation	Number of Shares Sold	Total Direct/ Indirect Holding
24	Sam Palung Social Enterprise Company Limited Head Office: 555/1 Energy Complex Building A, 10 th Floor, Vibhavadi Rangsit Road, Chatuchak, Chatuchak, Bangkok 10900, Thailand Telephone: +66-2537-2971 Facsimile: -	Social Enterprise	SPSE	1,000,000 Ordinary Share	PTTEP 15%
25	Aerosky Solutions Co Ltd. Head Office: 3/24 Phahon Yothin 13 Alley, Phaya Thai, Phaya Thai, Bangkok 10400, Thailand Telephone: +66-2618-2266 Facsimile: -	Drone Solutions for Infrastructure and Equipment Inspection	Aerosky	10,000 Ordinary Share	ARV 33%

1.3.2 Parties with potential conflicts

-None-

1.3.3 Relationship with the Major Shareholder

The Company's petroleum exploration and production business is part of the business group of PTT Public Company Limited (PTT), our major shareholder, the national energy company which engages in fully integrated petroleum and petrochemical businesses by strategically investing directly and indirectly through its group of companies, both in the upstream and downstream businesses.

Currently, PTT holds (both directly and indirectly) approximately 65.29% of PTTEP's registered and paid-up capital with PTTEP's petroleum exploration and production business, effectively making the PTT Group the only full-scale natural gas business operator in Thailand. As the major buyer of the Company's petroleum products, PTT, in turn, refines and processes the products and supplies them as energy and raw materials for the power, petrochemical, transportation sectors as well as other industries and households.

In 2021, PTTEP supplied crude oil, natural gas, LPG, and condensate to PTT. Conditions and price settings of all transactions between PTTEP and PTT follow the normal business practices at the arm's length basis conditions for non-related persons or operations. Details of connected transactions between PTTEP and PTT are disclosed in the "Connected Transactions" topic.

1.3.4 Shareholders

(1) Major Shareholders*

As of February 11, 2022, top 10 shareholders of PTTEP were as follows:

Rank	List of Major Shareholders	Number of Shares	% of Total Number of Shares
1	PTT PUBLIC COMPANY LIMITED ¹	2,532,340,489	63.79
2	THAI NVDR COMPANY LIMITED	292,036,543	7.36
3	SOUTH EAST ASIA UK (TYPE C) NOMINEES LIMITED	102,963,076	2.59
4	STATE STREET EUROPE LIMITED	96,222,376	2.42
5	SIAM MANAGEMENT HOLDING COMPANY LIMITED ²	59,520,000	1.50
6	SOCIAL SECURITY OFFICE	45,216,577	1.14
7	THE BANK OF NEW YORK MELLON	44,718,635	1.13
8	EGAT SAVING AND CREDIT COOPERATIVE LIMITED	43,815,500	1.10
9	SOUTH EAST ASIA UK (TYPE A) NOMINEES LIMITED	25,499,464	0.64
10	BNY MELLON NOMINEES LIMITED	19,366,479	0.49

Rank	List of Major Shareholders	Number of Shares	% of Total Number of Shares
	Total number of shares held by major shareholders	3,261,699,139	82.16
	Total fully-paid capital as of February 11, 2022	3,969,985,400	100

Remark: ¹ The Ministry of Finance, Thailand, is the major shareholder of PTT Public Company Limited (PTT).

² A wholly-owned subsidiary of PTT

(2) NVDR Holders**

Rank	NVDR holders, as of February 11, 2022 (Top 3)	Number of NVDR issues	% of total outstanding shares
1	STATE STREET BANK AND TRUST COMPANY	30,960,629	0.78
2	STATE STREET EUROPE LIMITED	28,635,113	0.72
3	SOUTH EAST ASIA UK (TYPE C) NOMINEES LIMITED	21,529,262	0.54
	Total shares	81,125,004	2.04

Remark: Source: <https://www.set.or.th/set/companyholder.do?symbol=PTTEP-R&language=en&country=US>

(3) Major Shareholder with Significant Influence over PTTEP's Policies or Operations

PTT, a major shareholder of PTTEP, takes part in determining PTTEP's policy and operations under the Board's approval. As of December 31, 2021, 3 out of the Company's 15 directors were either directors or executives from PTT.

(4) The Company Enters into Shareholders' Agreement with Effect to Security Offering and Issuance or Management Power of the Company

- None -

* Update information can be accessed through PTTEP website at <https://www.pttep.com/en/Investorrelations/Shareholderinformation/Top10shareholders.aspx>

** Since January 18, 2010, Thai NVDR Co., Ltd. has changed its rule to require a disclosure of names of NVDR holders having over 0.50% of paid-up capital of the underlying securities.

1.4 Registered and Paid-up Capital

As of December 31, 2021, PTTEP's capital structure consisted of USD 4,093 million in interest-bearing debt and USD 12,428 million in shareholders' equity, amounting to debt to equity ratio of 0.33. Details of the capital structure are as follows:

1.4.1 Ordinary Shares

As of December 31, 2021, PTTEP's registered and paid-up capital was THB 3,969,985,400, consisting of 3,969,985,400 ordinary shares at a par value of THB 1 per share.

1.4.2 Others Shares with Different Terms or Rights from Common Shares

-None-

1.4.3 Number of Shares and the Effects of NVDR Issuance on Shareholders' Voting Rights

An NVDR or Non-Voting Depository Receipt is a trading instrument issued by the Thai NVDR Company Limited, a wholly-owned subsidiary of the Stock Exchange of Thailand (SET). NVDRs are treated as listed securities (Automatic Listing) on the SET. The objective of NVDRs is to promote trading activities in the Thai stock market by removing obstacles such as foreign investment limits and other impediments faced by international institutional investors investing in listed securities on the SET. NVDR investors are entitled to receive all financial benefits, such as dividends, right issues, and warrants, as if they invest in common shares. The major difference between investing in NVDRs and ordinary shares is the lack of voting rights of the former. NVDR holders generally are not allowed to participate and vote in shareholders' meetings except only in the case where the company wishes to delist itself from the SET. In addition, although NVDRs are designed mainly to ease foreign investment barriers; the SET does not prohibit Thai investors from investing in the instrument. Detail of the total PTTEP share, held by NVDRs, is disclosed in the "Shareholders" topic.

1.5 Issuance of Other Securities

1.5.1 Convertible Securities

-None-

1.5.2 Debt Securities

Debentures

PTTEP has investment-grade credit ratings of Baa1, BBB+, and BBB+ from reputable international credit-rating agencies, namely, Moody's Investors Service (Moody's), Standard & Poor's Ratings Services (Standard & Poor's), and Fitch Ratings (Fitch) respectively. In addition, the Company has also been given a rating of AAA, the highest credit rating, by TRIS Rating Co., Ltd. (TRIS) which is a credit-rating agency in Thailand.

On November 5, 2021, PTTEP offered 5-year name-registered, unsubordinated, and unsecured digital debentures with a bondholders' representative in the amount of THB 6,000 million. The debentures bear a step-up interest rate of 2.00% - 2.75% per annum, averaging 2.25% per annum. The Company entered into a Cross Currency Swap transaction with a financial institution to swap THB debentures for USD 181.82 million at the average exchange rate of THB 33.00 per USD. Under this agreement, the average interest rate was charged at the rate of 2.53% per annum. As of December 31, 2021, PTTEP had the following outstanding debentures:

1) Details of THB debentures (total outstanding amount: THB 32,400 million)

Debt Security	Issued Date	Maturity Date	Tenor	Outstanding (Unit: THB Million)	Rate per annum	Credit Rating ¹	
						TRIS	
THB debentures, unsecured, unsubordinated	June 6, 2014	June 6, 2029	15 years	11,400 ²	Fixed 4.82%, coupon payment: semi-annually	AAA	
	June 19, 2019	June 19, 2022	3 years	15,000 ³	Fixed 2.26%, coupon payment: semi-annually	AAA	
	November 5, 2021	November 5, 2026	5 years	6,000 ⁴	A step-up fixed interest rate of 2.00%-2.75% per annum, averaging 2.25% per annum. coupon payment: semi-annually	AAA	

¹ The debentures, issued in 2014 and 2019, were last rated by TRIS on March 17, 2021 on PTTEP and PTTEP TC. The debenture issued in 2021 was rated by TRIS on September 14, 2021 on PTTEP.

² Issued by PTTEP; and in 2014, PTTEP entered into a CCS to swap THB 11,400 million for USD 349.05 million with an interest rate of 4.989% per annum.

³ Issued by PTTEP TC, and fully guaranteed by PTTEP; and in 2019 PTTEP entered into a CCS to swap THB 15,000 million for USD 480 million with an interest rate of 2.79% per annum.

⁴ Issued by PTTEP; and in 2021, PTTEP entered into a CCS to swap THB 6,000 million for USD 181.82 million with an interest rate of 2.53% per annum.

2) Details of USD debentures (total outstanding amount: USD 1,990 million)

Debt Security	Issued Date	Maturity Date	Tenor	Outstanding (Unit: USD Million)	Rate per annum	Credit Rating ¹		
						Moody's	Standard & Poor's	Fitch
USD debentures, unsecured, unsubordinated	June 12, 2012	June 12, 2042	30 years	490 ²	Fixed 6.350%, coupon payment: semi-annually	Baa1	BBB+	BBB+
	December 6, 2019	December 6, 2059	40 years	650 ³	Fixed 3.903%, coupon payment: semi-annually	Baa1	NA	BBB+
	January 15, 2020	January 15, 2030	10 years	350 ³	Fixed 2.993%, coupon payment: semi-annually	Baa1	NA	BBB+
	June 10, 2020	June 10, 2027	7 years	500 ³	Fixed 2.587%, coupon payment: semi-annually	Baa1	NA	BBB+

¹ The latest credit ratings were issued by Moody's on February 2, 2021, Standard & Poor's on May 12, 2021, and Fitch on May 11, 2021.

² Issued by PTTEP CIF, and fully guaranteed by PTTEP; and in 2013 repurchased in the amount of USD 10 million. As a result, the outstanding principal amount has been decreased from USD 500 million to USD 490 million.

³ Issued by PTTEP TC and fully guaranteed by PTTEP.

3) Details of THB Hybrid Bonds (total outstanding amount: THB 5,000 million)

Debt Security	Issued Date	Maturity Date	Tenor	Outstanding (Unit: THB Million)	Rate per annum	Credit Rating ¹	
						TRIS	
THB Hybrid Bonds, unsecured, unconvertible, callable, subordinated debentures with single redemption upon liquidation which PTTEP can defer the distribution at its sole discretion	June 15, 2012	No maturity date • payment upon liquidation or • early redemption subject to terms and conditions	Perpetual	5,000 ²	• Year 1-10: 5.85% • Year 11-30: 6.10% • Year 31-60: 6.85% • Year 61 onwards: 7.85%, • coupon payment: quarterly	AA	

¹ The latest credit rating was issued by TRIS on March 17, 2021.

² The accounting treatment of these hybrid bonds is such that they are recorded in shareholders' equity.

1.6 Dividend Payment Policy

Under normal circumstances, according to the Company's policy, PTTEP's Board of Directors generally recommends the shareholders an annual dividend payment of not less than 30% of the net income after tax. The Board of Directors, as appropriate, may also resolve to pay interim dividends and subsequently inform the shareholders accordingly in the next shareholders' meeting. For the Company's subsidiaries, the dividend policy is subject to cash flow, future investment plans, and other factors necessary for the continuity of their operations, and must be in compliance with related laws and regulations.

Meanwhile, the under terms and conditions of the Company's subordinated perpetual capital debentures No. 1/2555 of THB 5,000 million, issued in June 2012; if the Company defers an interest payment on these debentures or has outstanding deferred interest payments, the Company shall not declare or make any dividend payments.

Five-year dividend payment history of PTTEP is as follows:

Year	2017	2018	2019	2020	2021
Earnings per Share (THB)	4.54	8.69	11.72	5.65	9.70
Dividend per Share (THB)	4.25	5.00	6.00	4.25	5.00
Dividend Payout Ratio	88%	55%	49%	77%	50%

2. Risk Management

The petroleum exploration and production business is complex in both technical and operational aspects. This business also needs a high volume of investment for the pursuit of new investment opportunities, exploration, project development, and production activities. Nowadays, business operations are inevitably experiencing changes in the business environment and new risk factors that are increasingly promising, such as the COVID-19 pandemic that greatly impacts the global economy and humanity, oil price volatility, political unrest, laws and regulations varying in investment countries, declining demand for fossil fuels, importing of liquefied natural gas (LNG) to substitute domestic gas supply, disruptive technology and innovation, and cybersecurity risk. Moreover, global warming and climate change are becoming more critical issues. Many countries, including Thailand, had to come together on the pledge at the 26th United Nations Climate Change Conference of the Parties (COP26) for commitment in climate change solutions in order to drive the world transition towards “Low Carbon Future” and seriously reduce greenhouse gas emissions to “Net Zero”. Therefore, it is a great challenge that makes PTTEP places great importance on risk management and business continuity management to enhance the organization’s capability to rapidly respond to dynamic changes and manage all aspects of risks prudently in order to create value for stakeholders in both short term and long term along with sustainable growth.

2.1 Risk Management Policy and Plan

Risk Governance

The Board of Directors and the management are committed to effective risk management in PTTEP. As the changes in business environment are uncontrollable and may affect business operations, the Board of Directors approves Risk Governance Framework to define the oversight responsibilities and authorities on risk management that demonstrate strong coordination, collaboration, and communication in managing risks effectively among the board level, the management and business unit level. In addition, the Board of Directors also approves the Risk Appetite Statement to be used as a framework for all PTTEP business operations and seeking business opportunities with acceptable risks.

The Board of Directors appoints and delegates risk oversight authorities to Risk Management Committee. The Risk Management Committee approves the Enterprise Risk Management Policy and Framework as well as the Risk Metrics & Limits to define the boundary for PTTEP business activities to be operated and managed in accordance with Risk Appetite. The risk management unit is established to implement Enterprise Risk Management Policy and Framework company-wide and embed risk awareness and culture to PTTEP personnel in all business units in order to achieve effective risk management. Key risks, especially high impact to corporate level risks (Corporate Risk) and emerging risks, shall be periodically reported to the management, Management Committee, Risk Management Committee as well as the Board of Directors in a timely manner to ensure that key risks are well managed and to prevent the arising of negative surprise, reduce potential losses, and minimize recurrence risks.

PTTEP establishes Risk Management Structure in accordance with the Three Lines Model provided by the Institute of Internal Auditors (IIA) that promotes strong risk governance and effective risk management. The First Line Roles are all business units with a duty to operate business activities together with managing risks (Risk Owner). The risk owners work in conjunction with the Second Line Roles, which are risk management unit and other supporting functions [Subject Matter Expert (SME)], e.g. compliance unit and Safety, Security, Health and Environment (SSHE) unit, on consultation for complementary expertise

and assistance with managing risks. And last, the internal audit unit as the Third Line Roles performs an independent audit to ensure risk management implementing effectively and efficiently and provides recommendations for continuous improvement.

In 2021, PTTEP reviewed enterprise risk management and updated all relevant documents, including Risk Governance Framework, Risk Management Committee Charter, Risk Appetite Statement, Risk Metrics & Limits, Enterprise Risk Management Policy, Risk Management Standard, and Risk Management Guideline, in accordance with changes of business contexts to strengthen risk oversight to be more effective as well as to set practices to enhance and support the achievement of sustainability objectives.

Additionally, PTTEP is committed to overseeing risk management in new investment projects to achieve the Execute and Expand strategy such as Oman Block 61 Project and Malaysia Project, which has field operations in all of exploration phase, development phase, and production phase. In 2021, PTTEP conducted GRC Maturity Assessment in Malaysia Project to analyze strengths and develop plans to improve weaknesses in GRC, which included enhancing the effectiveness of risk management.

Risk Management Policy and Plan

The Risk Management Committee approves Enterprise Risk Management Policy and Framework which emphasize proactive risk management practices and strong risk management culture and provide systematic risk management process that is aligned with international standard ISO 31000:2018. In addition, the frameworks of the Committee of Sponsoring Organizations of the Treadway Commission (COSO) Enterprise Risk Management – Integrating with Strategy and Performance (COSO ERM 2017) and COSO Enterprise Risk Management – Applying Enterprise Risk Management to Environmental, Social and Governance-related Risks (COSO ESG 2018) have been applied to enhance the integration of enterprise risk management, strategic planning, and ESG-related risk management. The committees, the management, and employees at all levels have the responsibility to manage risks and promote comprehensive risk management to contractors, suppliers, and business partners to assure the achievement of our vision, mission, strategy, and business objectives.

In accordance with Enterprise Risk Management Policy and Framework, the risk management unit is responsible for overseeing the overall risk management and supporting the company-wide risk management both at the corporate level and operational level. The risk management strategy and plans have been formulated, aiming to integrate risk management into business activities and decision making which cover core business activities in PTTEP, such as strategic planning management, investment and divestment decision-making, capital project management, operations and business process management including business continuity management, and ESG management. In addition, the necessary resources for managing risks are allocated in proportion to the level of risk and cost-benefit consideration and the progress of risk mitigation plans are monitored together with the key risk indicators (KRIs) as an early warning tool in order to set up additional mitigation measures in a timely manner. Furthermore, the risk management unit shall escalate key risks with high impact to corporate level (Corporate Risk) and consolidate with emerging risks to formulate Corporate Risk Profile (CRP) in order to report to the management, Management Committee, and Risk Management Committee on a regular basis with promptly alert related committees if there is any significant change to managing risks in a timely manner.

In 2021, PTTEP improved enterprise risk management by fully integrating strategic risk management with the strategic planning process and execution. The assumptions used in the strategy formulation will be regularly monitored to be able to adjust

or exit the strategies in a timely manner. The ESG-related risk management has been incorporated in Risk Management Guideline for implementing throughout the organization. In addition, PTTEP has successfully implemented and benefited from the web-based Risk Register System (RR System) which has been developed and gone live since November 16, 2020. This system enables Risk Owners to quickly identify and analyze risks and enhance risk information communication throughout the organization. It also helps the Company to easily consolidate and escalate key risks to Corporate Risks and allows all relevant parties to monitor the risk management anywhere and anytime promptly and conveniently. In 2021, PTTEP was able to manage key risks effectively with no negative surprise due to non-registered risks.

PTTEP continues to strive for more efficient and faster risk management by developing Chat Bot to enhance risk identification capability. The risk database of RR System will be further utilized for Chat Bot development. The Chat Bot development is currently carrying out for best responding to the requirement of users as much as possible.

Risk Culture

As PTTEP focuses on building a strong risk culture to strengthen the risk management in the organization sustainably; therefore, the risk awareness is built up in all PTTEP personnel mindsets together with competency development via training and promoting activities. The management at all levels commit and serve as leaders and role models, as well as promote the implementation of risk management as a corporate culture. In addition, the management also supports employees on regular review and improvement of risk management by applying lessons learned and knowledge management for continual improvement. The risk coordinators are assigned for each business unit and project to work in coordination between risk owners and risk management units to drive the implementation of risk assessment and management throughout the organization. In addition, risk management results are also monitored and evaluated with key performance indicators for unidentified risk (Unidentified Risk KPI) for the management who performs as Risk Owner including the risk management unit which is responsible for overall enterprise risk management.

In 2021, PTTEP enhanced knowledge and understanding of the Board of Directors on the strategic risk management which has upgrading this year via GRC Moment. The series of podcast “Low Risk High Return - with No Random”, which were newly launched for online listening via various podcast applications throughout the year, could enhance more understanding and knowledge of risk management for all employees. In addition, many knowledge sharing sessions were organized to make employees aware of the up-to-date important global issues that may cause risk to the Company, for example, the political situation in the Republic of the Union of Myanmar (Myanmar) and Malaysia, etc. to enhance the capability of employees to better analyze risks and impacts on their responsible works and overall company.

2.2 Risk Factors for Business Operation

2.2.1 Current and Emerging Risks Facing Businesses of PTTEP and the PTTEP Group

(1) Strategic & Portfolio Risks

1) New Investment Risks

PTTEP continues to pursue an Expand strategy that focuses on investment in countries with the potential petroleum resources to maintain the reserves to production ratio greater than or equal to 5 years by seeking new opportunities with

world-class strategic partners. The Company's primary focus areas are the "Core Areas" of Southeast Asia and the Middle East where the Company has full range expertise, coupled with being the regions that have acceptable geopolitical risks and relatively low costs of development and production to PTTEP. Certain additional risks and uncertainties must also be considered, such as political stability, energy policy changes, including laws and regulations. Climate change and global warming, the COVID-19 pandemic, and oil price volatility have been significantly slowed down the economic recovery and remained points of concern for future fossil fuel consumption.

In this regard, PTTEP strategizes the direction onto Cautious Diversified Player that maintains the strengths of E&P business for energy security while exploring investment opportunities in environmentally friendly energy through new technology and processes along with concerns in the environment, society, and corporate governance (ESG) for the stable and sustainable growth. The Company has drawn up plans to mitigate those risks which may potentially affect our operations and investment growth, such as adopting strict due diligence within the Company's investment risk limit, monitoring and analyzing situation changes for strategy review and adjustment in a timely manner, considering regulatory requirements and economic feasibility as well as counterparty risk in order to develop clear mitigation plans in advance to reduce impact and likelihood of the risk. In addition, PTTEP also regularly assesses and analyzes risks associated with climate change in relation to the business, as well as an attempt to identify our "Low Carbon Footprint Reduction" roadmap, targets, and action plans to manage the risks and their impacts. The Company works to manage effects from related risks, such as the collection of carbon taxes in various countries that we operate in, and physical damage to our assets and construction structures caused by the rise in global temperature. Moreover, the Company has diversification plan to beyond E&P businesses in response to energy transition space by looking for new business opportunities such as lower carbon energy, hydrogen, and Carbon Capture Utilization and Storage (CCUS) to support low carbon future.

Investment in new countries or unfamiliar territories contains a number of inherent risks. The Company has therefore established risk mitigation guidelines for the assessment of each investment. The guidelines provide advice in various aspects, ranging from petroleum potential, size and project characteristics, acquisition procedures, additional reserves, operator's capability and performance, attractiveness of the fiscal regime, geographical conditions, related laws and regulations, political stability, issues concerning international relations, economic conditions and financial stability. Moreover, the Company also seeks advice from the consultant who has expertise in the invested country. The risks are then taken into account when preventive measures and options are formulated and integrated into a return-on-investment analysis or a joint venture agreement.

Investment in new projects, including farm-in and farm-out joint ventures, mergers and acquisitions, as well as withdrawal or divestment from any given project, must be intensively screened by the Investment Committee and the Management Committee. Their responsibility is to assess and ensure that each project adheres to the Company's investment direction and strategy, before proposing it to the Risk Management Committee prior to the final approval of the Board of Directors.

2) Organizational Capability Risks

Organizational capability is a key factor for the achievement of the Company's targets. Thus, business processes and human resources are, inevitably, of great importance. Potential risks include the risk from a lack of expertise and knowledge, and risk of business process ineffectiveness and inefficiency. In this regard, PTTEP has taken the following

actions to enhance our knowledge management, technology, business processes, and organizational capability to support the Company's operations and expansion to new opportunities.

Knowledge management is the Company's strategic tool to create, share, and apply the valued knowledge to our operation that supports innovation, company sustainable growth and improves our staff competency to prepare for the readiness to expand into new business opportunities. Knowledge Management roadmap and plan have been developed with the objective to become an Innovative and High Performance Organization (HPO). The Company plans and executes activities to drive the shared knowledge both from our staff within the Company and from the external expertise. In addition, the research and development of new technologies and innovation are carried out in line with the Company's growth strategy and to prepare for the energy transition. Our Capability and Technology Development Roadmap has been developed along with continuous research on technology to support business growth.

PTTEP has developed the information technology system to be an IT Global Platform, while maintaining system stability and control of confidential information, such as the use of cloud storage. The Company also develops staff competency to align with our strategy and plans, e.g. arranging in-house training for staff, called Digital Academy training, to improve staff understanding for adaptation to agile work and establish DCOE (Digital Center of Excellence) to be the center for the development of technology capability for our staff, such as data scientists and data engineers.

Regarding organizational structure and work process, the organizational structure, systems, and procedures are improved and developed in line with PTTEP's growth strategy and business plan. These include the development of new Delegation of Authority and Signatures (DAS) concept to increase organizational agility while maintaining sufficient control, adoption of the "New Way of Working" to allow PTTEP staff to safely and effectively work from home amidst challenges from the external environment, e.g. COVID-19 pandemic, protest, etc., and lastly, effectively manage workforce planning to enhance the Company's competitive advantage.

In Human Resources, to prepare for our investments in our core business and new business opportunities including smooth transition, the Company has devised Human Resources Development plans to recruit required and qualified staff members to support in operating and targeted countries. The plans focus on developing their capabilities and leadership, recruiting external personnel in key positions that do not yet have in-house personnel, together with enhancing our employee engagement. PTTEP conducts its Employee Engagement Survey every 2 years. The recent results in 2020 confirmed that our staff engagement is continuously improving. In 2021, during the ongoing spread of COVID-19, PTTEP additionally organized company activities both online and offline to increase employee engagement as well. In addition, PTTEP conducted Human Resource Process Improvement to align with digital transformation and New Way of Working and also instilled our values and culture cultivation (Core Values: *EP SPIRIT*) in Thailand and acquired companies overseas such as Malaysia Project, Myanmar Project, and G1 Project. PTTEP is proceeding to further promote desirable *EP SPIRIT* behaviors for executives and employees through improved communications and ensuring that new staff understand the *EP SPIRIT* in our core values. Furthermore, PTTEP has revisited the Core Values: *EP SPIRIT* plan to support our investments in our core business and new business opportunities, including smooth transition in Thailand and companies overseas to prepare staff which are planned to support new business to show *EP SPIRIT* expected behaviors, so they can work with the same standard of expected behaviors

to attain the Company's vision and mission and also ensure that development and growth of the Company are in line with PTT Group's goals.

(2) Financial & Market Risks

1) Financial Risks

PTTEP determines an effective financial risk management policy under an acceptable financial risk limit defined and regularly reviewed by the Risk Management Committee. The financial risk limit is also considered in funding and liquidity management activities to ensure a robust capital structure and financial health to suit the current market environment and to support the Company's investment plans and execution in both the short and long term.

Major financial risks consist of counterparty risks and liquidity risks. For counterparty risk, it is the PTTEP Group's policy that we conduct business transactions only with reputable, trusted, and creditworthy counterparties. The financial stability and credibility of each counterparty must be analyzed and reviewed regularly. Currently, the majority of the PTTEP Group's products are sold to PTT, which is our parent company. For liquidity risks arising from the inability to maintain adequate working capital necessary for the operations, the PTTEP Group has a policy to manage such risks by preparing appropriate cash flow forecasts and maintaining both committed and uncommitted credit facilities with financial institutions to support its working capital requirements.

2) Marketing and Distribution Risks

Revenue mainly comes from domestic gas sales which PTT is the major customer. PTTEP has entered long-term gas sales agreements (GSAs) with PTT and the terms of the GSAs generally last 15-30 years. If later on, a project has potential reserves beyond the volume specified in its GSA, PTTEP will analyze and negotiate the GSA for this additional volume, either for additional gas sales or period extension. Moreover, to mitigate market risks which can result in refusals from buyers to purchase contracted volumes of natural gas, GSAs stipulate obligations for the buyer and the seller to commit to the annual minimum volumes. Buyers must pay for the committed volumes of gas, whether or not the full amount is taken (Take-or-Pay).

As a part of Thailand's government policy to liberalize natural gas market, Energy Regulatory Commission (ERC) granted the LNG shipping license to 3 private companies this year. This is expected to have a minimal impact on PTTEP's gas sales because the licenses allow only LNG import for additional volume over the committed gas sales in current GSAs, and current GSAs with PTT also have Take-or-Pay obligation as mentioned above. To effectively cope with the dynamics of Thailand's energy demand, the Company closely monitors petroleum demand in coordination with PTT and related government agencies to collectively outline an optimized supply plan. The Company reviews and adjusts our production as well as project development plans regularly to ensure that the development master plan is able to optimize reserves and resources of existing assets to match the country's energy demand. We also have a project in the Republic of Mozambique (Mozambique) which possesses large natural gas reserves that can be developed as a Liquefied Natural Gas (LNG) project. This project is a good example of projects which fit in well with PTT's plan to import LNG as well as to contribute effectively to the enhancement of the energy security of Thailand.

3) Risks from Major Client Dependency

Petroleum exploration and production business requires substantial investments for exploration, drilling, production facilities, and platforms construction before receiving revenue from selling petroleum products and earning required return. Therefore, executing long-term sales contracts with clients possessing acceptable financial capability is essential in order to secure financial stability over contract lifespan. Especially for natural gas which has a constraint in transportation and marketing comparing to crude oil, there are only few numbers of potential buyers who fit with long-term sales contract. Most of them are National Oil Companies or companies who have gas separation plants or gas supply chain businesses with stable financial status and ability to add value to natural gas in long term. For crude oil and liquefied petroleum gas (LPG) which do not have a constraint in transportation or product quality, PTTEP conducts a competitive bidding process for short-term contracts. There are various bidders internationally including trading companies and regional refineries. The bidding prices are usually referenced to major crude in the global market.

For Thailand, PTTEP's major and most important client is PTT who purchases most of PTTEP's petroleum products from domestic projects not only natural gas but also crude oil and condensate. Revenue from PTT is considered the major income for PTTEP. Currently, PTT is the sole buyer who buys natural gas from all producers in the Gulf of Thailand where the gas will be transported through subsea pipeline to gas separation plants before delivery to PTT's customers. PTTEP has entered long-term gas sales agreements (GSAs) with PTT and the terms of the GSAs generally last 15-30 years. In addition, the GSAs stipulate annual minimum gas volume to be purchased known as Take-or-Pay obligation where buyers must pay for the committed volumes of gas, whether or not the full amount is taken. The Take-or-Pay obligation is the mechanism to secure revenue for sellers and therefore mitigate investment risks. Moreover, to ensure that the return is justified to both seller and buyer and also worth for the investment which could cover the risk that might happen during the project life, the gas prices shall require approval by the Petroleum Committee with consent from the Energy Minister according to the Petroleum Act, to ensure reasonable benefits for all stakeholders – government, investors, and people.

Considering the trends of Thailand gas demand-supply where the demand grows while the supply decreases gradually, having PTT as the major client is considered as low risk in client dependency. Moreover, PTTEP has other international customers and also follows our strategy to expand investment in other countries especially in Southeast Asia and the Middle East regions for enhancing petroleum production and sales including enlarging our client base.

4) Petroleum and Oil Price Risks

PTTEP product prices depend on the world's crude oil prices, which are subject to multiple factors beyond our control, for example, the COVID-19 outbreak situation which leads to lockdown measures in different countries and directly affects global oil demand. Additionally, there are global oil supply factors from major oil producers, e.g. OPEC's production cut policy and its members' compliance level, and another major oil producer, the United States (U.S.) where the oil production has been maintained low due to financial discipline. There are also more factors that impact oil price, e.g. COVID-19 vaccination progress, U.S. sanction policy, Strategic Petroleum Reserve (SPR) drawdown policy, and economic stimulus from various countries. Fluctuations in the world's oil prices immediately affect the prices of the PTTEP Group's crude oil and condensate. Yet, while natural gas prices tend to follow oil prices, most of the PTTEP Group's contractual natural gas

prices are adjusted every 3, 6, or 12 months, depending on the gas price formula of each project. As a result, natural gas prices are more stable than those of crude oil and condensate.

To reduce impacts from oil prices volatility, the PTTEP Group closely monitors oil prices and implemented an oil price hedging program with the objective of minimizing negative impacts on the Company's cash flow and operating performance.

5) Exchange Rate Risks

The PTTEP Group adopts the U.S. Dollar (USD) as its functional currency in accordance with the Thai Financial Reporting Standards (TFRS) since prices of the PTTEP Group's major petroleum products, such as crude oil and natural gas, are mostly referenced in USD. The PTTEP Group's cash flows are, however, still exposed to USD/THB rate movement due to the settlement of USD-linked revenues being in THB. This is because a majority of the PTTEP Group's trade customers are Thai entities; hence, revenue from USD-linked petroleum products is restricted to be paid in THB equivalent to USD only, while the Company's main cash outflows for investments and operating expenditures are mostly in USD. The currency mismatch and discrepancies between payables' and receivables' settlement periods as well as the USD/THB volatility therefore inevitably impose foreign exchange risk on our cash flows. Under this circumstance, the PTTEP Group has minimized the foreign exchange risks by matching revenues and expenses cash flow in THB (natural hedge) and employs applicable financial derivative instruments, such as forward and option contracts, to hedge the foreign-exchange exposure with reference to exchange rates in the sales agreements.

With USD as the functional currency, the PTTEP Group is also exposed to the foreign-exchange translation risk arising from the translation of non-USD assets and liabilities at the end of every accounting period. To minimize such translation risk, the PTTEP Group has consistently put in great efforts to maintain a proper balance between our non-USD assets and liabilities, mainly in THB. The Company also entered into cross-currency swaps on non-USD denominated obligations by converting both interests and principal payments to USD to reduce the impacts of exchange rate volatility.

6) Interest Rate Risks

The PTTEP Group is exposed to interest rate risk as the risk affects future cash flows and fair values of the financial instruments employed. The PTTEP Group eliminates and minimizes the risk by maintaining an appropriate debt portfolio optimization (ratio of fixed-rate liabilities and floating-rate liabilities) and using financial derivatives, such as using interest rate collar (Zero Cost Collar). Interest rate risk management is conducted dynamically, appropriately, and correspondingly to the nature of the business, the market conditions, relevant costs, and the Company's acceptable risk limits.

(3) Political and Legal/Regulatory Risks

1) Political Risks in Investment Countries

Based on PTTEP's investment strategies, we aim to invest in focused areas of strategic significance in order to accommodate long-term growth. It is possible that such areas may be prone to geopolitical risks. Given this circumstance, PTTEP not only sets a certain level of risk limit of countries which such limit is derived from the political situation, economy, business and investment environment, laws and regulations, but we also appoint a geopolitical risk team to closely monitor

the situations in countries and territories where PTTEP operates from international sources. PTTEP periodically conducts analysis of the situation developments and changes regarding political stability, macroeconomic conditions, legal and regulatory aspects, and security across a range of investment countries. Thus far, two areas, i.e. the Middle East and North Africa, have been identified as areas with significant geopolitical/country risks. Nevertheless, all projects in which PTTEP currently invests have not experienced any direct negative impacts. For the case of the political issue in Myanmar, PTTEP is closely monitoring the situation development and has already prepared additional business continuity plans to ensure PTTEP's ongoing operations. PTTEP also monitors the security situation in Mozambique to evaluate impact on the project and identify remedial steps.

In addition, PTTEP incorporates both the assessment of geopolitical risks and country risks into an investment process and project management for further decision-making and preparation of contingent plans for management and related departments.

Results from the geopolitical risk and country risk analysis in our investment areas are used to formulate geopolitical risk rating scores which will be considered as part of the assessment process before making decisions on whether to invest in new projects. In addition, PTTEP liaises closely with the Ministry of Foreign Affairs and Royal Thai Embassies in countries we invest to ensure that the Company's business operations are well-supported by relevant government agencies and that the projects are aligned with the respective national energy policies.

2) Compliance Risks

Generally, these risks can result from a variety of factors, such as the complexity of specific laws, changes made to existing laws and regulations, misinterpretation of laws, or even nuances of the language in which the laws are written. The risks can potentially lead to certain actions or conduct that may be deemed incorrect, ultimately causing the violation of or non-compliance with applicable laws which may then lead to pecuniary forms of punishment, such as fines and operational difficulties, potential revocation, suspension of licenses, and possible damage to the PTTEP Group's reputation. To minimize these risks, the Governance, Compliance, Internal Control, and Subsidiary Management Department is responsible for assuring that all of the business units of the PTTEP Group strictly comply with their relevant laws, thereby building confidence among the Company's shareholders, Board of Directors, the management, and employees that we are in full compliance with laws relating to our business operations. As such, this department closely and regularly monitors the cabinet resolution, bills of laws, and relevant applicable laws which may affect PTTEP's operations. Details are disclosed in the "Corporate Governance" section, under the "Laws" topic.

PTTEP continued to focus on anti-corruption risks and monitoring programs. Details are disclosed in the "Corporate Governance Milestones" section, under the "Anti-Corruption" topic.

(4) Operational Risks

1) Exploration Risks

Exploring new petroleum resources is essential to the E&P business. In addition to finding petroleum reserves to replace those already produced, it is also looking for new reserves to generate revenue growth for PTTEP according to its corporate strategy. This is to support the growth of petroleum production according to the corporate goals in the future.

The objective of exploration is to search for sizable petroleum resources that can be commercialized. The risks associated with exploration activities are geological risks and the uncertainty of discovered resources volume (Resources Volume Uncertainty).

Managing key exploration risks thus depends on the evaluation of exploration areas with good chances of finding sizable petroleum resources that allow for commercial development and production within an appropriate timeline and cost. The key factors that affect investment decisions on petroleum exploration include chance of success, resources estimation, exploration and production period, planned expenditures including development, operating and decommissioning cost, and terms of contracts. Various activities are normally performed to understand and mitigate risks in exploration, i.e. geological studies, seismic acquisition and interpretation.

PTTEP establishes clear processes and criteria in project evaluation at each stage of E&P life cycle, starting from potential petroleum basin evaluation and selection, in-depth subsurface studies of targeted blocks, and above-ground investment risks. The Geosciences and Exploration Group of PTTEP is tasked with formulating the exploration strategy and managing the exploration portfolio, allocating and prioritizing the exploration budget to high-potential opportunities. This process is reviewed and revised annually to ensure that the exploration strategies are updated and aligned with the corporate targets.

In addition, the Company also stipulates that exploration studies need to be reviewed by the Technical Assurance Committee to ensure that all key technical aspects and uncertainties are covered. The assessment must also be in line with PTTEP's standards as well as PTTEP's guidelines to ensure investment decisions with confidence and that the results of the exploration are in accordance with PTTEP's goals.

To align with the Company's strategy, PTTEP has a policy to diversify exploration investment by distributing the investment proportion in many areas around the world and sharing risks and rewards with strategic partners who have exploration expertise to extend the Company's exploration success.

2) Project Development Risks

PTTEP applies expertise in project management to commercialize discovered resources within schedule and optimum budget. Even though the projects are under various constraints which can affect the performance of development projects, for example, commercial negotiation with partners and government, reservoir performance, contractor/service providers performance, cost overruns, and unforeseen technical difficulties. In addition to regularly implemented value assurance systems in project management enhances the Company's capability to manage those factors with risk prevention and mitigation measures, which are:

Project management: To achieve project completion and optimum investment, the Company focuses on policy establishment and value assurance measures in critical stages of projects, including organization, project planning and engineering system designs, contract management, procurement, and construction monitoring.

Personnel and process: the Company focuses on the skills and capability in project management of personnel for both operating and non-operating projects, including the recruitment process for acquiring experience personnel in the competitive employment market. Information and experience from previous projects are gathered and formulated as an in-house database to improve the accuracy of evaluation process for the new development project. Ultimately, overall evaluation process of all new projects will assure under the Company's Project Realization Process (PREP) to ensure the success of projects in all aspects, including safety, quality, timely manner, and optimum budget.

Commercial contracts: To ensure efficiency in minimizing the risks associated with noncompliance in contracts and disputes while working with contractors, the Company focuses on contract definitions of terms and conditions and contract administration. These risks can, however, be controlled by negotiations based on comprehensive competency, knowledge, and concerted efforts from various departments, such as those of construction, engineering, procurement, finance, accounting, and legal aspects. Prudent contract management also lessens the risks and helps mitigate possible damage which could result from delays, potentially causing adverse effects on a given project and the Company's performance at large.

3) Production Risks

In every production process, PTTEP has to face various potential risks, starting from the production process at the bottom of the well until the point of sale. These risks include risk of well potential, production design flaws, damaged equipment, aging facilities, operation errors, product quality, including those related to external factors such as site access constraint in the expiring concession, the COVID-19 pandemic, and political unrest causing delays in production and other development activities for international projects, all of which can directly impact the corporate goals, production and sales targets.

Mitigation of production risks focuses on the areas of process planning and platform design, production control systems, and preventive maintenance. Operational Excellence Management System -Reliability & Asset Integrity (RAI), which is a part of the Operational Excellence Project, has been adopted and continuously improved to ensure the highest standards of production in terms of integrity and safety. The RAI has been designed specifically to minimize production losses due to worn-out equipment and also to improve equipment efficiency through preventive maintenance and inspection, with the goal of achieving zero unplanned shutdowns. Meanwhile, work procedures, operation manuals, and extensive training programs have been improved, developed, and adopted to instill greater understanding and efficiency among the Company's operating personnel. Plans have also been put in place to minimize the impact of the new project site access problem, including finalization of manpower recruitment, sales agreements, equipment procurement, and other preparation activities for the new Production Sharing Contracts (PSCs) ahead of time, to minimize the remaining work once the site can finally be accessed. In addition, PTTEP has a Crisis Management Plan, as well as a Business Continuity Plan (BCP) to mitigate the impacts of the COVID-19 pandemic and political unrest to ensure uninterrupted petroleum supply including close coordination with concerned parties such as government agencies, clients, and stakeholders, on a regular basis for immediate mitigation plans.

During security situations, Force Majeure has been declared at some project sites for the safety of employees and contractors, and a special taskforce was set up to evaluate the impact on the project and identify remedial steps.

The Company has also received ISO 22301 Business Continuity Management System (BCMS) certification. The certified sites include S1 Project, Zawtika M-9 Production Operations and Business Support (Myanmar), Petroleum Development Support Base (Songkhla), and PTTEP Headquarters - Office Facility Management. Business Continuity Management (BCM) provides a formal plan that will keep effective and prompt business operation during the disruptive period to build customer and stakeholder confidence.

4) Safety, Security, Health, and Environmental Risks

PTTEP has continued to analyze Safety, Security, Health, and Environment (SSHE) risks to reduce the likelihood and impacts of unexpected events. The analysis comprises the identification of internal and external factors. This helps to prevent major accidents as well as to reduce the risks that would affect the PTTEP Group's employees, assets, environment, and social communities. This will also assure safe and effective business continuity with full compliance to international and local regulations where PTTEP operates.

PTTEP has managed SSHE risks through the Company's SSHE Management System by setting the SSHE policies, standards, guidelines, and procedures for employees and contractors, so that they understand the implementation process and its objectives. This is in addition to fostering SSHE awareness in the corporate culture by providing training relating to SSHE and risk management to improve knowledge and performance as well as to keep process safety risks to the As Low As Reasonably Practicable (ALARP).

PTTEP has monitored SSHE Risk Management through the Company's Risk Management Committee at various levels and with a variety of key risk indicators and trackers, for example, Total Recordable Injury Rate (TRIR), audit findings and close-out status, natural disasters, security status, pandemic and health infection in high-risk countries, to ensure that all situations are being monitored to determine the suitable mitigation plans for prevention, correction, and improvement towards achieving even higher social and business sustainability.

5) Social and Community Risks

PTTEP commits to being a good corporate citizen and responsible to society and communities, places importance on human rights, and takes into account risks and impacts in everywhere that PTTEP operates, both in domestic and international exploration and production areas. Therefore, in compliance with Community Relations and Management Policy and Corporate Social Responsibility Policy, PTTEP emphasizes social development, local environment and living standard improvement, natural resources and environment conservation, as well as value creation for our stakeholders along with the sustainable growth of PTTEP that consequently gain trust, acceptance and also support undertakings that will bring benefits to the Company and society as a whole.

All stakeholders, including government agencies, are regularly engaged and communicated. PTTEP's social strategy is designed as a two-level strategy: the macro-level strategy focusing on restoration of marine abundance and promoting activities that reduce marine debris and the micro-level strategy focusing on the promotion and development

of social development projects in PTTEP operating areas, which is in line with the United Nations Sustainable Development Goals (SDGs). In addition, PTTEP developed the Issue and Stakeholder Management System (ISMS) to assess social impact and issues that may be a cause of concern for the community. The community relations officers shall revise and update the ISMS Report annually. In 2021, PTTEP developed ISMS Report Online System and implemented it in all operating assets in order to deliver the information for monitoring and selecting suitable and appropriate social development projects for each operating area. In dealing with complaints, PTTEP has a standard approach and regular monitoring set by Grievance Handling Guidelines. The benefits from PTTEP social development projects delivered to stakeholders are evaluated and the stakeholder perception and commitment survey is conducted to provide great value to the Company to make the social development projects best serve the needs of stakeholders further.

In respect of human rights, PTTEP manages salient human rights issues from its direct operations covering employees, communities and vulnerable groups, supply chain, and SSHE. The management approach takes into consideration the rights of all relevant stakeholders such as children, minorities, indigenous people, and migrant workers. The assessment of human rights risks is conducted based on two factors: likelihood and impact, which is in line with the PTT Group and due diligence of the United Nations Global Compact Management Model, International Petroleum Industry Environment Conservation Association (IPIECA), and International Finance Corporation (IFC) – Guide to Human Rights Impact Assessment and Management – HRIAM.

PTTEP embedded the fundamental principles of human rights as part of PTTEP Good Corporate Governance and Business Ethics and developed Human Rights Policy and Management System Guideline covering the due diligence process and capability development framework to create awareness and shared responsibility for staff, suppliers, and contractors as well as business partners through various communication channels, e-Learning, panel sessions, etc. In addition, the Company is committed to a third party audit on a 3-year basis (last audit in 2020) to assess PTTEP's human rights due diligence and risk management to ensure the Company's effective management, resulting in PTTEP being recognized by international organizations such as United Nations Global Compact (UNGC) and Dow Jones Sustainability Indices (DJSI). Besides, at the national level, PTTEP received the award for the 2021 Role Model Organization on Human Rights in State Enterprise Sector for the 3rd consecutive year from the Rights and Liberties Protection Department which is a result of PTTEP's best efforts in aligning its human rights practices with the National Action Plan on Business and Human Rights in all dimensions. The details on human rights risk assessment from PTTEP operations and mitigation plans are available on PTTEP website at <https://www.pttep.com/th/Sustainabledevelopment/Governanceriskmanagementandcompliance/Humanrights.aspx>.

6) Cybersecurity Risks

Cyber threats occur and spread across multiple business sectors through various channels which can potentially lead to business disruption. PTTEP recognizes the importance of safeguarding against cyber threats and includes the risk of digital security threats in the Company's Corporate Risk Profile to closely monitor the development as well as to implement necessary measures. These measures include raising Cybersecurity awareness, Phishing simulation for the Company's staff, establishing a Cyber Security Operation Center (CSOC) responsible for monitoring cybersecurity incidents, Security Information and Event Management (SIEM) responsible for collecting and providing real-time analysis of security alerts, conducting Cyber Security Response Drills, regularly performing Data Backup and reviewing the Disaster Recovery Plan.

The results are subsequently reported to the Risk Management Committee and the Board of Directors respectively to ensure prompt responses to disruptive and emergency situations.

PTTEP currently refers to the National Institute of Standards and Technology (NIST) as a standard framework for managing cybersecurity. Risk assessment has been carried out based on the ISO 27001:2013 standard for the electronic-mail system and data center facility since 2014 and has a risk assessment plan based on the ISO 27001:2013 standard for every system. PTTEP is confident of the readiness to participate in the test and report significant cyber threats to government agencies as required by law.

In 2021, PTTEP implemented Multi-factor Authentication (MFA) to enhance the identity verification of the staff other than conventional username and password to support the Company data and system access from anywhere and anytime as per PTTEP's direction of New Way of Working to promote Work-Life Balance of its employee.

Furthermore, PTTEP also implemented Data Classification and Labelling with Microsoft Azure Information Protection (AIP) to support permission and sharing management of document confidentiality.

PTTEP also established Security Operations Center (SOC) that completely connected Security Information and Event Management (SIEM) with the network firewalls across all petroleum development bases to ensure cybersecurity protection in the Company's operation.

7) Risks arising from COVID-19 that Adversely Impacts the Business Operation

From the spread of COVID-19 since 2020, PTTEP is at risk of operating its business due to the infection of employees who work in the office and employees who travel to different working areas, including the risk of infection by contractors working in all areas of the Company's operations. Therefore, PTTEP has a management approach to mitigate such risks, by establishing COVID-19 Taskforce team to closely monitor the pandemic situation and take preventive measures to respond to the situation in a timely manner together with providing knowledge and understanding to employees on how to behave themselves to reduce the risk of infection, by the Company's medical team. There are measures for employees to work from home to reduce the chance of infection from traveling to work and reduce congestion in the office. This is in line with the government's lockdown measures. PTTEP has also managed the risk of IT security (Cybersecurity) to reduce the risk of working through the internet and networking from home, such as raising awareness of cybersecurity for employees, Cyber Security Response Drill, data backup, and Disaster Recovery Plan (DRP), etc. Before entering the operation's working areas, employees and contractors are required quarantine period and health screening to ensure that they are safe from the COVID-19 infection. In addition, PTTEP has provided COVID-19 vaccines to employees and their families including related contractors. This is to build herd immunity in our working people.

PTTEP has established a Business Continuity Plan (BCP) for all units which have been assessed that there are key activities requirement of priority recovery in order to prevent business disruption. Backup persons are being prepared and can replace key staff, who might be unable to work due to the COVID-19 infection. The BCP also covers the Emergency Response Plan to critical incidents or the potential impact of a lack of other essential resources such as Building, Equipment, Technology, Human Resources, and third parties (BETH3) including suppliers/contractors, etc.

Additionally, the spread of COVID-19 is leading to the risk of the decline in crude oil demand due to various measures imposed by each country to prevent the spread of the COVID-19 pandemic, such as the country's lockdown, the reduction of activities, etc. PTTEP has prepared to cope with the changing of this challenging situation by emphasizing the Execution strategy that focuses on increasing production volumes from major operation assets and continuously controlling unit costs to maintain competitiveness. Digital technology is also utilized to increase productivity. There is organization restructuring management for New Way of Working and improving internal organizational capabilities on working processes while maintaining the efficiency of operations according to the committed plans.

(5) Emerging Risks

With the current situations, such as changes in business environment and advanced technology as well as the rising of stakeholder expectations on the Company's regulations compliance and more intensive environmental impact mitigation measures, PTTEP therefore keeps monitoring situations and assessing emerging risks that may affect the Company's business operations in the future and report to the management and relevant committees in order to follow up and update risk mitigation plans as well as to adjust corporate strategy efficiently. These would also enhance our competitiveness and create an opportunity to continue our business with sustainable growth. Currently, PTTEP has identified and keeps monitoring on 2 emerging risks as follows.

1) Climate Change Risks

In view of extreme weather events and natural disasters posing more severe, coupled with the greenhouse effect, PTTEP, an exploration and production company, is well aware of risks from climate change and its possible impacts on our business operations in various aspects, namely (1) Physical risk refers to the risks arising from the physical impact of climate change, such as heat wave, heavy precipitation, tropical cyclone, drought, and water-related risks and (2) Transition risk or risks arising from changes in policy, law, technology, or market shift to green energy. At the 2015 United Nations Climate Change Conference (COP21) held in Paris, France, heads of state and governments around the world signed an agreement with the aim of reducing greenhouse gas emissions and substituting low-carbon fuels for typical fossil fuels. To reduce the worst impact of climate change and accelerate each country's climate actions, the 26th United Nations Climate Change Conferences of the Parties (COP26) was recently held in Glasgow, Scotland, in November 2021, with the world leader promising on speeding up towards net zero greenhouse gas emissions (Net Zero) and energy transition towards low carbon society. Thailand has also committed to reaching Net Zero emissions within 2065, which energy sector is one of the key sectors playing an important role in the achievement of this commitment.

PTTEP realizes the significance of climate change management and conducted the climate-related risk assessment for both existing projects and acquiring projects. The assessment covered short-term risk (2020-2025), medium-term risk (2025-2035), and long-term risk (2035-2050) under various scenarios according to the Representative Concentration Pathway (RCP), Stated Policies Scenarios, Sustainable Development Scenario (SDS), and IPCC 1.5°C Scenario. The physical and transition risk assessment results have revealed that PTTEP was ranked in low-to-medium risk level for all scenarios and timeframes, which confirmed appropriate management corresponding with the climate change risk. With prompt response to

the global and national climate change actions, the Company closely monitors and tracks climate change that may affect corporate risk level in order to manage risks with the balancing of the risk appetite and corporate sustainable development.

PTTEP has reviewed and updated climate change risk assessment and greenhouse gas reduction plans in alignment with the global commitment to control the temperature well below 1.5-2 degrees Celsius. We are reviewing the Company's long-term target and strategy towards Net Zero according to Thailand's commitment and long-term plan from COP26 by focusing on company investment strategy and actions at operating assets. For the Company's greenhouse gas management plan of operating assets, it covers improving work processes to maximize energy efficiency and 25% reduction of greenhouse gas emissions intensity by 2030 (compared to the base year of 2012). Moreover, the Company has conducted studies on potential CO₂ sequestration under PTTEP reforestation projects as well as carbon offsetting through various mechanisms. Correspondingly, PTTEP has also engaged with the Thailand Greenhouse Gas Management Organization (Public Organization) (TGO) to develop a set of activities, measures, and policies to reduce greenhouse gases under the Thailand Voluntary Emission Reduction Program (T-VER).

PTTEP's strategy on the new business opportunities emphasizes the gas value chain businesses, including the "Gas to Power" project and Liquefied Natural Gas (LNG) project, as well as renewable energy opportunities which will also support the transition to a low-carbon society.

2) Risks Arising from Disruptive Technology that Adversely Impacts Oil and Gas Industry

Technological advancement and growth in renewable energy are playing an increasingly crucial role in the energy industry. They come in all forms, such as more reliable and efficient energy storage, battery-powered cars [Electric Vehicles (EV)], as well as other renewables and EV businesses whose production costs have plummeted over the years making consumers easier to access products comparing to the recent years. Such disruptive technologies coupled with the government's policy regarding environmental issues with the intention of reducing greenhouse gas (GHG) emissions following the recent United Nations Climate Change Conference of the Parties (COP26), Thailand increase Nationally Determined Contributions (NDC) to reduce GHG emission reduction by 40% in 2030 to reach carbon neutrality in 2050 and Net Zero GHG emissions within 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. Those policies can cause tremendous damage to the petroleum industry. Oil demand has consequently been affected; many believe that days of the oil era are now numbered. This situation will be PTTEP's primary strategic risk as it directly impacts our revenues from crude oil and condensate that made up 38.35% of total revenue. Additional risks include the loss of production cost advantages due to accelerated technology development by competitors.

New technology is a key factor in the volatile energy business. PTTEP's vision for technology development is to become an energy technology partner, enhancing E&P business competitiveness and readiness for future energy transitions to ensure the Company's sustainable growth. PTTEP develops technology through partnerships with both Thai and international parties and institutions. Moreover, knowledge sharing is crucial, both within PTTEP and with partners across sectors. By encouraging collaboration, the Company brings together various expertise inside and outside the energy sectors to jointly develop technologies and innovation to enhance capabilities and achieve sustainable business objectives.

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2.2.3 Risks Facing Investing in Foreign Securities (If the Issuer is a Foreign Company)

-None-

3. Driving Business for Sustainability

3.1 Sustainability Management Policy and Target

PTTEP Sustainability Management Overview

PTTEP's Sustainability Management integrates our responsibilities to the environment and society as a part of our business decisions to meet the expectations of our stakeholders, investors, shareholders, business partners, host governments, various communities, and employees. We continuously emphasize effective management of the three pillars of sustainability to reflect all ongoing concerns regarding any economic, social, and environmental issues. Sustainability targets and strategies, and their implementation are driven by efficient business processes, funding, Governance, Risk Management, and Compliance (GRC) management, technology and innovation, cost reduction, and human capability development to enhance production and to achieve work efficiency as well as to create value for the Company and our stakeholders. To accomplish this, we have adopted His Majesty King Bhumibol Adulyadej The Great's (Rama IX) Sufficiency Economy Philosophy (SEP) as a guideline for our business operations and have aligned our sustainability management with the United Nations Sustainable Development Goals (UN SDGs), focusing on Goals 7, 8, 12, 13, 14, and 16 that related to our material sustainability issues while continuing our support for the remaining SDGs in our routine operations. Further, we use the Dow Jones Sustainability Indices (DJSI) to measure our sustainability performance at the international level.

The Company has developed the Sustainable Development Policy to be adopted across the entire organization. The purpose is to demonstrate our definite sustainability objectives and determination to overcome the challenges of developing and becoming a sustainable organization. For the Sustainable Development Policy, please visit the Company's website (www.pttep.com). The Company has also developed the Sustainable Development Guideline underlying various aspects which are important to the sustainability of the organization to establish a universal understanding of the Company's approach to sustainability and international standards and policies, such as Corporate Social Responsibility Policy which is in line with ISO 26000, Safety, Security, Health and Environment (SSHE) Policy of the International Association of Oil & Gas Producers (IOGP), International Petroleum Industry Environmental Conservation Association (IPIECA), OHSAS 18001, and Human Rights Policy complies with the United Nations' Universal Declaration of Human Rights (UDHR). All divisions within the Company also strictly adhere to our Corporate Governance and Business Ethics, local laws, culture, and values, while interacting with all stakeholders, such as employees, communities, suppliers, business partners, regulators, and investors.

In 2021, PTTEP was selected as a DJSI member in the World Oil and Gas Upstream & Integrated Industry for the 8th consecutive year and was chosen as a member of the FTSE4Good Index Series for the 6th consecutive year. In addition, we were listed in 2021 Thailand Sustainability Investment (THSI) for the 6th year by the Stock Exchange of Thailand (SET).

For more details, please see PTTEP Sustainability Report 2021 and visit PTTEP website at <https://www.pttep.com/en/Sustainabledevelopment.aspx>

Materiality Assessment

PTTEP's materiality assessment process engages both internal and external stakeholders by using international standards, such as the Global Reporting Initiative (GRI Standards) Sustainability Reporting Guideline & Oil and Gas Sector Disclosures (OGSD) framework – core level, IPIECA's Oil and Gas Industry Guidance on Voluntary Sustainability, Dow Jones Sustainability Indices (DJSI), AA1000 AccountAbility Principles Standard (2018) (AA1000APS), and SASB Materiality MapTM of Sustainability Accounting Standards Board (SASB). This includes a thorough review of the current and future business risks and opportunities in the business, social and environmental dimensions, to identify and prioritize the Company's material sustainability issues which are significant issues to our business and stakeholders. Additionally, the Materiality issues are used as key inputs for the development of PTTEP Sustainability Strategy and long-term targets, which are publicly disclosed in our Sustainability Report.

In 2021, 8 material sustainability issues of importance were reviewed from the process of engaging with our stakeholders and the standard materiality assessment process. The 8 issues are listed below:

Business Dimension

- Governance, Risk Management, and Compliance
- Reserve to Production Ratio
- Human Resource Preparation
- Technology and Innovation
- Occupational Health and Safety

Social Dimension

- Contribution to Community and Society

Environmental Dimension

- Lower Carbon Future
- Environmental Management

The Company's assessment review process for identifying the material sustainability issues for 2021 includes a structured and systematic review of the issues with significant business, environmental, and social impact on the Company as well as those issues which are important to our stakeholders. The assessment is conducted by identifying the material issues of the Company, defining reporting boundaries, and prioritizing the issues. The result is subsequently submitted to the Management Committee and the Board of Directors for content review and approval.

For more details, please see PTTEP Sustainability Report 2021 and visit PTTEP website at

<https://www.pttep.com/en/Sustainabledevelopment.aspx>

Sustainable Development Philosophy, Framework, and Target

PTTEP developed the Sustainable Development Framework as a foundation to support our journey towards sustainability to achieve our vision of becoming the Energy Partner of Choice. The framework comprises 3 main components, namely: High Performance Organization (HPO) or “Be Smart”, Governance, Risk Management and Compliance (GRC) or “Be Good”, and Stakeholder Value Creation (SVC) or “Be Responsible”. The framework also corresponds with the United Nations Sustainable Development Goals (SDGs).

PTTEP is confident that this strong foundation as well as conscious consideration of all stakeholders’ interests will enable us to deliver value and foster sustainability for the wider world (From We to World).

Within the Sustainable Development Framework, PTTEP set the strategic direction that is Execute and Expand towards Energy Transition and formulated the sustainability strategy through the materiality assessment process to address and prepare for future challenges as our strategic direction as well as create long-term sustainable value in response to stakeholders’ expectations. Our sustainability strategy and corporate long-term targets (2030) are as follows:

Thrive in Lower Carbon Future

- 1) Sustainable E&P Business Strategy
- 2) Diversification to Beyond E&P Strategy
- 3) Greenhouse Gas Management Strategy

The targets are as follows:

- 5% CAGR Production Growth
- Maintain Proved Reserve to Production Ratio (R/P Ratio or 1P/Production) at no less than 5 years
- Unit cost in the top quartile among peers
- 20% of net income from beyond E&P business
- Achieve zero work-related accident (SSHE Target Zero)
- Reduce greenhouse gas emissions intensity by at least 25%, compared to the 2012 base year

Sustain Business Integrity Excellence

- 1) Smart Assurance Strategy
- 2) GRC in Common Sense Strategy

The targets are as follows:

- Become GRC role model among Thai Listed Companies
- Increase GRC Maturity Level to the highest level at Level 5 (Continuous Improvement with Automation)

Optimize Resource & Create Shared Value

- 1) Circular Model for E&P Strategy, which consists of the following targets:
 - At least 50% of main structures must be reused, with safety awareness, and efficient conditions
 - Zero waste to landfill

2) Ocean for Life Strategy, which consists of the following targets:

- 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
- 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

For more details, please see PTTEP Sustainability Report 2021 and visit PTTEP website at

<https://www.pttep.com/en/Sustainabledevelopment.aspx>

Operation and Reporting

PTTEP has adopted the Global Reporting Initiative (GRI Standards), using sector-specific guidelines of the GRI, such as the Sustainability Reporting Guidelines & Oil and Gas Sector Disclosures (OGSD) – core level which is one of the world's most prevalent guidelines for sustainability reporting to provide information in regards to the Company's economic, environmental, social, and governance performance. Information on the Company's capability to reduce greenhouse gas emission, for example, is also included in the report. The high standard, comparable to those of financial management, allows the Company to monitor our sustainability effectively. The report includes sustainability data and performance indicators from all parts of the business. This ranges from business planning, corporate risk assessment, internal control process, internal auditing, monitoring, and reporting of the Company's performance. PTTEP also adopts and includes other international best practices in our sustainability report, such as Dow Jones Sustainability Indices (DJSI) best practices and requirements, AA1000 AccountAbility Principles Standard (2018) (AA1000APS), SASB Materiality Map™ of Sustainability Accounting Standards Board (SASB), UNGC – Advanced Level, IPIECA's Oil and Gas Industry Guidance on Voluntary Sustainability and SDG Compass to support the UN Sustainable Development Goals. The Company's material sustainability issues which are significant issues to our business and stakeholders have been continuously disclosed to all stakeholders to inform our sustainability management.

For more details, please see PTTEP Sustainability Report 2021 and visit PTTEP website at

<https://www.pttep.com/en/Sustainabledevelopment.aspx>

3.2 Stakeholder Impacts Management in the Business Value Chain

3.2.1 Business Value Chain

To achieve our vision to become an Energy Partner of Choice, in 2021, PTTEP created and passed on value to all stakeholders through the allocation of resources in 6 areas: Financial Capital, Production Capital, Human Capital, Intellectual Capital, Social and Relationship Capital, and Natural Capital, which the work processes that support the Company's vision and strategy. For more details, please see PTTEP Sustainability Report 2021 at "Stakeholder Value Creation" topic.

3.2.2 Stakeholder Analysis in the Business Value Chain

PTTEP organizes engagement activities with 9 key stakeholder groups: (1) Government Agencies and Regulators (2) Vendors, Suppliers/Contractors (3) Customers (4) Employees (5) Shareholders, Investment & Financial Institutions and Creditors (6) Business Partners, Consortium and Joint Ventures (7) Communities (8) Independent/Public Organizations, NGOs, and Academics (9) Press and Media. The objective of stakeholder engagement is to solicit feedback and expectations and discuss and communicate them to exchange viewpoints. PTTEP uses issues raised by the stakeholders as input to improve the efficiency of our business operations.

For more details about stakeholders' expectations and our responses, please visit PTTEP website, Sustainable Development topic, at <https://www.pttep.com/en/Sustainabledevelopment.aspx>, subtopic: "Stakeholder Management"

3.3 Sustainability Management in Environmental Dimension

3.3.1 Environmental Policy and Practice

PTTEP realizes that compliance with standards and regulations on community, social, and environmental protection (covering various topics including Climate Change, Spill, Biodiversity, Waste, Air Pollution, and Water Resources) is essential to our business sustainability. Not only does it reduce direct and indirect environmental impacts, but also helps gain trust from our stakeholders. The Company also promotes the responsible use of natural resources, environmental protection as well as sustainable conservation and management. There are major environmental targets which are in line with our sustainability strategy as follows:

- 1) Reduce greenhouse gas emissions intensity at least 25% by 2030, compared to the 2012 base year.
- 2) Achieve zero hazardous waste to landfill by 2020; zero industrial waste to landfill by 2025; and zero total waste to landfill by 2030.
- 3) Achieve zero oil and chemical spill.
- 4) Avoid operating in areas at risk from water scarcity and ensure that there is no impact on the community and water users.
- 5) Avoid operating in World Heritage sites as defined by UNESCO and achieve No-Net Loss of biodiversity in protected areas as defined by the International Union for Conservation of Nature (IUCN) by 2024.
- 6) 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.
- 7) No Gross Deforestation for E&P.

For more details about environmental management, please visit PTTEP website, Sustainable Development topic, at <https://www.pttep.com/en/Sustainabledevelopment.aspx>, subtopic: "Environmental Management"

3.3.2 Environmental Performance

In order to achieve major environmental targets, PTTEP strives to operate various environmental management including Climate Management, Spill Management, Biodiversity and Ecosystem Services Management, Waste Management, and Water Management. In order to achieve important environmental goals, PTTEP is committed to environmental management in various fields. PTTEP also engaged the third party verifier to provide the assurance of environmental data that information is disclosed on PTTEP website.

For more details, please visit PTTEP website, Sustainable Development topic, at <https://www.pttep.com/en/Sustainabledevelopment.aspx>, subtopic: "Environmental Management" and "Assurance Statement".

Environmental Management

PTTEP commits to operating business conscientiously and responsibly towards society and the environment by adhering to the Safety, Security, Health, and Environment (SSHE) Policy which includes a commitment to environmental protection by following Safety, Security, Health and Environment Management System (SSHE-MS), standards, procedures, guidelines and work instructions. In alignment with the policy, the Environmental Management Strategic Roadmap is established to demonstrate PTTEP's commitment to achieving cleaner petroleum exploration and production with environmental stewardship. The roadmap also supports the Company's sustainability long-term strategy/target and the Company's environmental management requirement to achieve SSHE Target Zero. The roadmap defines the long-term environmental management plan to reduce environmental impacts, promote the circular economy concept and create positive environmental value.

PTTEP's environmental management is an integral part of the Safety, Security, Health and Environment Management System (SSHE-MS) and is aligned with the ISO 14001 international standard. PTTEP requires all operating assets to implement and certify the ISO 14001, which resulted in the achievement of the latest ISO 14001:2015 certification for PTTEP's operating assets in Thailand, Zawtika Project in Myanmar, and Sarawak Project in Malaysia from SOCOTEC certification (under United Kingdom Accreditation Service – UKAS).

PTTEP assesses each project's environmental activities against regulatory requirements, the Company's standards and/or international standards. The environmental assessment covers all phases of E&P activities including exploration, development, production, and decommissioning phase. Such environmental assessment is a tool to identify and evaluate environmental issues and impacts. Mitigation and monitoring measures are then set up and implemented to minimize environmental impacts regarding project activities. PTTEP also submits the environmental compliance and monitoring reports to authorities to assure our environmental performances are followed by mitigation and monitoring measures stated in the environmental assessment. It is noted that all operations related to the environment are regulated by country authorities where PTTEP operates.

The Company's environmental performance is disclosed in PTTEP Sustainability Report 2021 and PTTEP website at <https://www.pttep.com/en/Sustainabledevelopment.aspx>, subtopic: "Environmental Management".

Performance over the Past 3 Years

Between 2019-2021, PTTEP strictly complied with both Thai and International legislations, and other regulations and requirements concerning the area of Safety, Security, Health and Environment (SSHE). For example, PTTEP conducted the Environmental Impact Assessment according to the requirements/regulations of countries we are operating in, submitted Safety, Security, Health and Environment performance reports to the Department of Mineral Fuels on a monthly and annual basis. Those included the annual SSHE audits at operating sites by the Department of Mineral Fuels. The achievements of our environmental performance are represented by the following national and international awards and recognitions:

1) PTTEP has achieved a member status from the Dow Jones Sustainability Indices (DJSI) World in Oil and Gas Upstream & Integrated Industry for the 8th consecutive year since 2014. PTTEP has received higher Best-in-class ratings and top scores (100/100) ratings in multiple categories.

2) PTTEP has been listed in the 2021 Thailand Sustainability Investment (THSI) from the Stock Exchange of Thailand for the 6th consecutive year as the listed company that has operated the business with sustainability with outstanding performance in the dimension of Environment, Social, Economic, and Good Governance performance.

3) SSHE performance report as included in the Company's Sustainability Report has been assured by an independent third party since 2012, according to the Global Report Initiative (GRI) for the 9th consecutive year.

4) PTTEP has achieved the international standard ISO 14001 certification since 1997 and continuously maintained ISO 14001:2015 recertified by SOCOTEC Certification (Thailand) Co., Ltd. under the accreditation of the United Kingdom Accreditation Service (UKAS). The certificate has been implemented with One Common System for ISO 14001 to enhance the effectiveness of environmental management and promote continuous improvement which is aligned with SSHE-MS.

5) PTTEP has received the Green Office award at the Excellence (G-Gold) Level for all company's offices for the 5th consecutive year (2017-2021). The event is held by the Department of Environmental Quality Promotion. In addition, the Company received the Green Office award at the Excellence (G-Gold) Level for PSB (Songkhla)'s office for the 2nd consecutive year (2020-2021).

6) PTTEP has received LESS (Low Emissions Support Scheme) Award Letter of Recognition from Thailand Greenhouse Gas Management Organization (TGO) for the 6th consecutive year. In 2021, the Company also received this award in energy efficiency project and waste recycle project for PSB (Songkhla). The total amount of greenhouse gas emission reduction is 309 tonnes of carbon dioxide equivalent.

7) PTTEP has received the certificate of registration under Thailand Voluntary Emission Reduction Program (T-VER) from Thailand Greenhouse Gas Management Organization (TGO) for PTTEP PSB Solar Rooftop Project. The estimated amount of greenhouse gas emission reduction from this project in 2021 is 95 tonnes of carbon dioxide equivalent per year.

8) PTTEP has received the certificate from Thailand Greenhouse Gas Management Organization (TGO) for implementing of Carbon Neutral Event from the 2021 PTTEP Annual General Shareholders' Meeting Event. The Company has provided carbon credit with an amount of 2.73 tonnes of carbon dioxide equivalent to compensate for greenhouse gas emission from this event.

9) PTTEP has been recognized as a constituent member of the FTSE4Good Index Series for the 6th consecutive year. FTSE Russell confirms that PTTEP has been independently assessed according to the FTSE4Good criteria and satisfied the requirements to become a constituent of the FTSE4Good Index Series. Created by the global index provider FTSE Russell, the FTSE4Good Index Series are designed to identify companies that demonstrate strong Environmental, Social, and Governance (ESG) practices measured against international standards. PTTEP is regarded as one of the top 10 for both Environmental and Governance dimensions in Energy sector.

10) PTTEP has disclosed our environmental management to the Carbon Disclosure Project (CDP) since 2007 and rated for Climate Change in “Leadership Level” for 7 consecutive years since 2014 and “Management Level” in 2021, as well as rated for Water in “Leadership Level” in 2017 and “Management Level” since 2018. This is to recognize our outstanding achievement in sustainable climate change and water management practices.

Safety, Security, Health and Environment Management

PTTEP develops, implements, and continuously improves our Safety, Security, Health and Environment (SSHE) Culture based on the long-term roadmap to achieve our ultimate goal, which is to prevent any accident that may result in injury, occupational illness, and any other work-related harm. In 2021, PTTEP's SSHE strategy was focused on continuous improvement of the Company's SSHE Management System (SSHE-MS) in both operational and process safety, and the strengthening of our SSHE culture. We aim to reach the highest level within our SSHE Culture Maturity Model, primarily by enhancing the accountability of our line management with regard to their roles and responsibilities. Furthermore, we will be promoting SSHE leadership among our employees and contractors at all levels. Importantly, PTTEP is still dedicated to carrying through with strong efforts to improve and sustain the environment in all areas of our operations. Successful implementation of these SSHE requires full commitment from all of PTTEP Group's personnel, from the highest executive officer to the operational staff and contractors.

In 2021, PTTEP's SSHE Key Performance Indicators of spill rate was better than those of the previous year while the Lost Time Injury Frequency (LTIF) and Total Recordable Injury Rate (TRIR) were both slightly increased; however, all should still be in the top and second quartile of IOGP's performance. This is a direct result of our SSHE risks management and control to be As Low As Reasonably Practicable (ALARP) and our ongoing incident prevention campaigns in operations.

PTTEP emphasises and commits to continuously improving SSHE implementation, so as to achieve our ultimate goal of being a “Zero Incident Organization” where employees and contractors can come to work and return home safely every day.

3.3.3 Impact of Business Operation on Environment

Details are disclosed in the “Legal Dispute” topic.

3.4 Sustainability Management in Social Dimension

3.4.1 Social Policy and Practice

PTTEP values social development as well as the conservation of natural resources and the environment. All our stakeholders, including government agencies, are regularly engaged and regularly communicated with through meetings,

activities, and projects conducted across our operating areas. A long-term strategy for social projects is in place to build trust and acceptance from the communities including relevant stakeholders, in accordance with the Community Relations Management and Corporate Social Responsibility Policy. PTTEP strives to gain trust, acceptance, and supports undertakings that will bring benefits to the Company and society. In order that PTTEP's commitment to conducting business with the balance of business, society, and environment, 17 Sustainable Development Goals (SDGs) have been adopted as a framework for implementing our social development projects.

In addition, PTTEP respects human rights wherever it operates and commits to fundamental human rights by honoring local laws, cultures, traditions, and values in treating employees and stakeholders as well as avoiding human rights violation. PTTEP developed the Human Rights Policy and Human Rights Management System as well as conducted an annual human rights risk assessment.

For more details, please visit PTTEP website, Sustainable Development topic, at <https://www.pttep.com/en/Sustainabledevelopment.aspx>, subtopic: "Stakeholder Management", "Social Development", "Human Resource Management", and "Human Rights"

3.4.2 Social Performance

In 2021, PTTEP focused on implementing social development projects under the framework of the 17 Sustainable Development Goals (SDGs). There were highlight social development projects under the Ocean for Life strategy, covering environmental management activities and marine debris, ecological preservation and increase marine resources, and providing opportunities for local economic development in the operating area. In addition, as our commitment to respecting human rights, PTTEP conducted an annual human rights risk assessment in 2021 covering all operating assets to assess risks caused by the Company's operations and to determine mitigation measures.

For more details, please visit PTTEP website, Sustainable Development topic, at <https://www.pttep.com/en/Sustainabledevelopment.aspx>, subtopic: "Stakeholder Management", "Social Development", "Human Resource Management", and "Human Rights"

3.4.3 Impact of Business Operation on Social Responsibility and Human Rights

Details are disclosed in the "Legal Dispute" topic.

4. Management Discussion and Analysis of Operating Results

4.1 Overall Performance of PTTEP

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 achieved greenhouse gas intensity reduction by 24.1% from the target of 25% by 2030, comparing with the base year 2012. 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. Underwater Learning Site Project. These projects have contributed to the reduction of environmental impact on the Company's offshore operations with the value of 29.5% improvement compared to the negative impacts of the 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 THB 110 million both directly and indirectly to related organizations 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 Block H Project in Q1/2021, the gas discovery in Sarawak SK 410B 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 the Sultanate of Oman (Oman). As a result, these aforementioned achievements 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 established subsidiaries to support the investment and expansion of these new businesses.

With all of the above achievements, PTTEP, as a result, recorded a better financial performance in 2021, compared 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 recognized asset impairment loss of 183 MMUSD from the Mozambique Area 1 and Yetagun projects.

As of 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 a debt-to-equity ratio at 0.33, reflecting a strong and healthy financial structure.

Table of Key Financial Results

(Unit: MMUSD)	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

1) Crude Oil Prices

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 to an average of 60.2 USD per barrel 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 an 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 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 high record, 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 causes 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.

2) 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 the COVID-19 outbreak. However, from mid-year onwards, the Asian Spot LNG Price has dramatically increased 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 the shutdown of several LNG projects. For the global LNG market in 2021, the 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)

3) Thailand's Energy Demand

Source from EPPO of the Ministry of Energy, 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, 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.

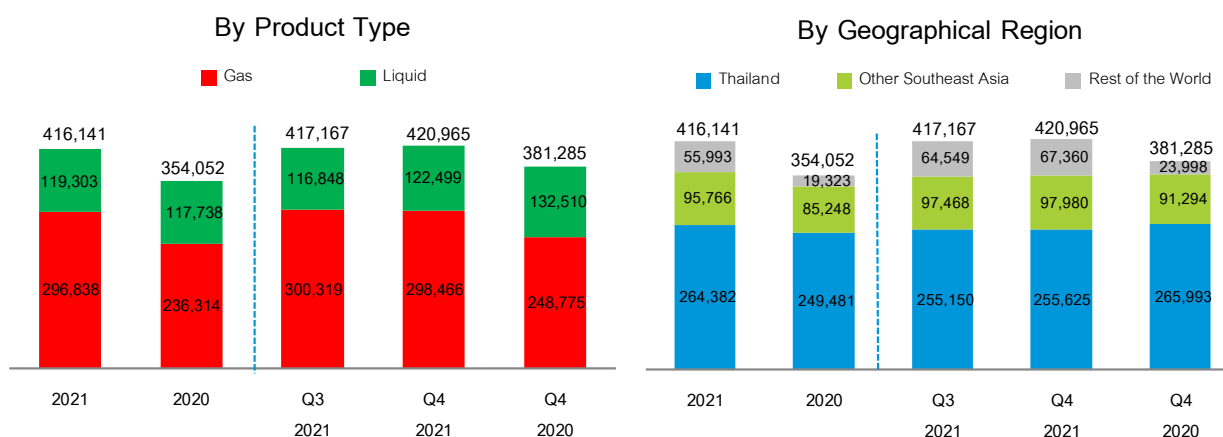
4) Exchange Rates (Thai Baht against US Dollar)

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 the Bank of Thailand continue to exercise fiscal and monetary policy measures to support the economy. However, with the 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



Average selling price and Dubai crude oil price (Unit: USD)	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 excluded deemed income for tax payment by the 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 buyers, together with Malaysia Projects from Block H Project first gas production in February 2021 coupled with a 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 buyers, 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 Block H Project, offset with Bongkot Project due to lower gas nomination from buyers. 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 a 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 an increase in revenue from sales and recognition of gain from a bargain purchase of Oman Block 61 Project, offset with a 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 follows.

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 an increase in sales revenue from 1,688 MMUSD, primarily from petroleum sales revenue with an 18% increase in average sales volume and a 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 a gain on foreign exchange forward contracts due to the depreciation of Thai Baht against USD. On the other hand, a 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 a 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 a 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 follows.

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 a 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 expenses 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 a 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 follows.

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 a 27% increase in average selling price and a 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 expenses 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) (Unit: MMUSD)	2021	2020	% INC (DEC) YTD	Q3 2021	Q4 2021	Q4 2020	% INC (DEC) QoQ	% INC (DEC) YoY
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.

1) Exploration and Production Segment

1.1) 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 expenses from deferred tax assets. In addition, depreciation, depletion, and amortization increased from higher average sales volume.

1.2) 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.

1.3) 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.

2) Head Office and Other Segments

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 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.

1) Exploration and Production Segment

1.1) 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 Block K Project.

1.2) 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.

1) Exploration and Production Segment

1.1) 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 while income taxes increased from higher profits. In addition, other income increased from an increase in participating interests of Block K Project.

1.2) Africa

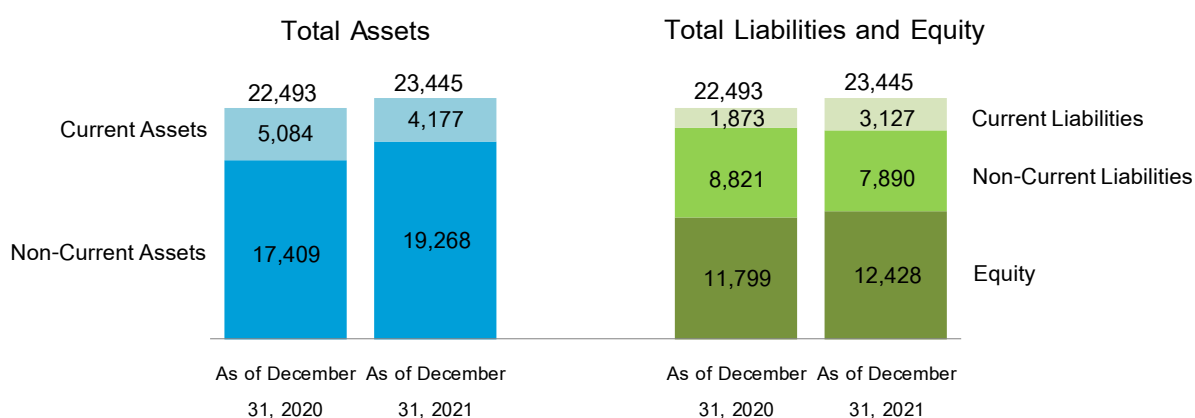
In Q4/2021, Africa reported a net loss of 169 MMUSD, a change of 201 MMUSD or more than 100% when compared with a net profit of 32 MMUSD in Q4/2020, primarily from impairment loss on Mozambique Area 1 Project.

2) Head Office and Other Segments

In Q4/2021, Head Office and Other Segments 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 Group 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



1) Assets

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

1.1) Non-current assets, which were primarily comprised 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.

1.2) 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.

2) Liabilities

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

2.1) Current liabilities, which were primarily comprised 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 the current portion of long-term liabilities of 498 MMUSD from Thai Baht debentures with 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.

2.2) Non-current liabilities, which were primarily comprised 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 maturity in June 2022, offset with an issuance of Thai Baht digital debentures of THB 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.

3) Equity

As of December 31, 2021, the Group had equity of 12,428 MMUSD, an increase of 629 MMUSD from equity as of 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.

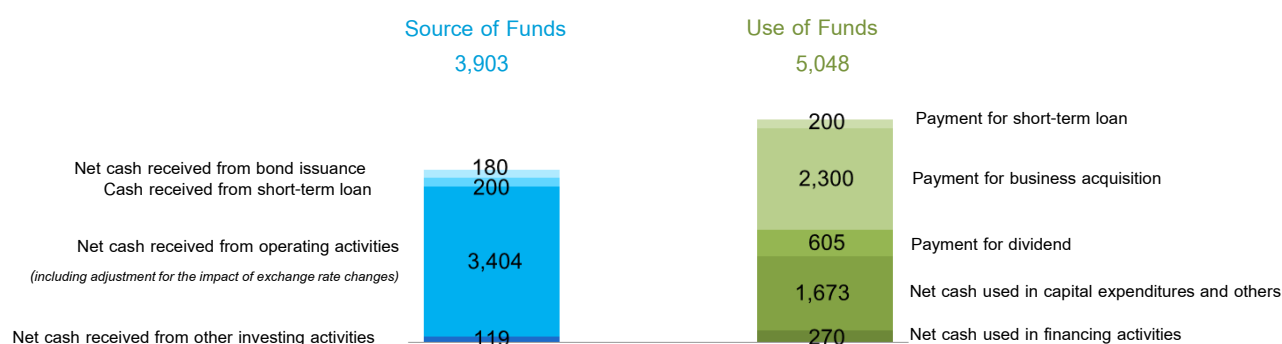
4) Capital Structure

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 2,559 MMUSD. In addition, the Group maintained its debt-to-equity ratio of 0.33 representing 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 THB 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 of 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.

Remark *Exclude short-term investment in the form of bank fixed deposit with maturity of more than 3 months but within 12 months of 100 MMUSD as of December 31, 2020.

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.

Key Financial Ratios

	2021	2020	Q3 2021	Q4 2021	Q4 2020
Profitability Ratios (%)					
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 Ratios (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.

Remarks:

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

4.2 Factors That May Impact Future Operations

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 key project highlights are disclosed in the 1.2.2 Products and Services topic, under the "Principal Projects in Operation" sub-topic.

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 8th consecutive year and also a constituent of the FTSE4Good Index Series for the 6th consecutive year. Domestically, PTTEP received Best Sustainability Awards from SET Awards 2021 in the category of Sustainability Excellence for the 2nd consecutive year and was listed in 2021 Thailand Sustainability Investment (THSI) for the 6th year by the Stock Exchange of Thailand (SET).

PTTEP has established our sustainable development framework which comprises 3 main components namely: High Performance Organization (HPO), Governance, Risk Management and Compliance (GRC) and Stakeholder Value Creation (SVC). Key highlights are as follows:

1) High Performance Organization and Thrive in Lower Carbon Future

1.1) 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 405 B, Sarawak SK 410 B, Sarawak SK 438, Sarawak SK 314 A, 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 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 a 25% stake in the Sharjah Area C, which is an onshore gas and condensate block in the exploration phase, located in the Emirate of Sharjah, UAE. This transaction aligns with PTTEP's investment strategy, focusing on prolific areas in the Middle East.

- Drive LNG value chain to focus on the upstream and liquefaction plants, including becoming LNG shippers and developing LNG capabilities via PTT Global LNG Limited ("PTTGL").

1.2) 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 has 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 FutureTech Energy Ventures Company Limited, FutureTech Solar (Thailand) Company Limited, and Delta Gas Transportation Limited. Furthermore, in 2021, ARV has established 4 subsidiaries, namely Rovula (Thailand) Company Limited, Skyller Solutions Company Limited, Varuna (Thailand) Company Limited, and 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.

1.3) Greenhouse Gas Management Strategy

PTTEP is committed to managing 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 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 of 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 THB 6,000 million, 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 follows:

- The technology for contaminant removal in condensate is successful in field trial test, 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 has been field trial tested in the 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 expand 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 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 aerial 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 creating innovation and a systematic process as well as solid proof to PTTEP's HR management system, which is on a par with international standards in terms of recruitment, employee development, and corporate-culture formation.

2) Sustain Business Integrity Excellence

PTTEP is committed to conducting its business with transparency and effectiveness by adhering to 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.
- Enhanced 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), expecting to complete in 2022.
- Studied the possibility of aligning and integrating assurance activities to reduce process redundancy.
- Continued building GRC culture to increase awareness, understanding, and implementation through communication campaigns such as promotional materials in the format of VDO Clips, games, and sharing experiences including conducting a post survey to measure employee's understanding and awareness after participating in GRC activities throughout the year to plan for GRC communication in next year.
- Conducted Stakeholders Engagement Survey and take the results to develop an 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 an annual Human Rights Risk Assessment. In 2021, the risk assessment covered 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 3rd consecutive year.

PTTEP's strong commitment and concrete performance have 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 4th time and the 2 awards from 16th ASIAN ESG Award 2021 – The Best of Asia by Corporate Governance Asia in Hong Kong; Asia's Icon on Corporate Governance for the 9th consecutive year and Asian Corporate Director Recognition Award given to Mr. Phongsthorn 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 5 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".

3) Optimize Resource & Create Shared Value

PTTEP is concerned 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 Project 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 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 consisted 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 THB 1 billion. PTTEP won 3 awards from 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 strengthen the country's energy security.

Future Business Outlook

1) Energy Outlook

The COVID-19 pandemic and subsequent economic downturn have 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 relied primarily on fossil fuels such as crude oil, natural gas, and coal. It is forecasted that fossil fuel 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 a key role as the 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 the Government's budget to provide support and supply chain bottleneck. However, in the longer term, demand for renewable energy will eventually recover, 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 the country's power generation from renewable sources and promoting electric vehicle usage to 30% in 2030.

2) Oil Price Outlook

As COVID-19 Omicron and Delta variants spread at the end of 2021, it potentially has an impact on oil market in 2022. While the vaccination might help at a certain level, the immunity also varied depending on vaccine type and booster shot programs. Europe 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 by 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 on 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 depending 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 such as OPEC, Russia, and the U.S., sanction policy to Iran as well as SPR drawdown policies.

3) LNG Market

The oversupply situation of the global LNG market is expected to prolong throughout 2022, with a 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 drives 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).

4) 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 turn, 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 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 a sustainability strategy to address these issues under PTTEP's Sustainable Development Framework. The framework comprises 3 main components, namely High Performance Organization (HPO), Governance, Risk Management and Compliance (GRC), and Stakeholder Value Creation (SVC). The balance of these 3 components will support PTTEP's journey towards sustainability. Please refer to "Strategies under Sustainable Development Framework" topic for more details.

5) Thai Economy and Foreign Exchange Outlook

The Bank of Thailand (BOT) expects the economy to expand at 3.4 percent in 2022 as the recovery of economic activities continues and more foreign tourists are 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, the Bank of Thailand expects to support policies that provide accommodative financial conditions and do 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 a fixed rate.

6) 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 allowed tax filing to be done in US Dollar, which is the Company's functional currency for the fiscal year starting from 2020. The PTTEP Group 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.

7) 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 acquired 20% interest, with a 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 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 6-24 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 of 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 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.

4.3 Significant Financial Information

The financial statements of PTT Exploration and Production Public Company Limited and subsidiaries have been prepared in accordance with Thai Financial Reporting Standards (TFRS) as well as the financial reporting requirements of the Securities and Exchange Commission under the Securities and Exchange Act. For more details, please see in Part 3 Financial Report.

Statement of Financial Position

PTT EXPLORATION AND PRODUCTION PUBLIC COMPANY LIMITED AND SUBSIDIARIES
STATEMENT OF FINANCIAL POSITION

	As at December 31, 2019 *		As at December 31, 2020 *		As at December 31, 2021	
	Thousand (USD)	%	Thousand (USD)	%	Thousand (USD)	%
Assets						
Current Assets						
Cash and cash equivalents	2,822,897	12.7	3,704,003	16.5	2,559,189	10.9
Short-term investments	200,000	0.9	100,000	0.4	-	-
Trade and other receivables	983,201	4.4	790,763	3.5	1,000,303	4.3
Inventories	330,337	1.5	338,105	1.6	420,969	1.8
Current tax assets	55,338	0.2	56,168	0.2	59,366	0.2
Derivative assets	12,342	0.1	4,362	0.0	16,427	0.1
Other current financial assets	213,703	1.0	-	-	-	-
Other current assets	95,472	0.4	90,847	0.4	120,414	0.5
Total Current Assets	4,713,290	21.2	5,084,248	22.6	4,176,668	17.8
Non-current Assets						
Investments in associates	227,626	1.0	216,866	1.0	220,880	1.0
Investments in joint ventures	225,370	1.0	233,344	1.0	210,235	0.9
Long-term loans to related parties	86,056	0.4	74,945	0.3	41,500	0.2
Property, plant and equipment	10,661,984	47.8	9,837,537	43.7	11,379,664	48.5
Right-of-use assets	-	-	482,778	2.1	519,711	2.2
Goodwill	1,903,802	8.5	1,903,803	8.5	1,740,803	7.4
Intangible assets	131,976	0.6	130,453	0.6	135,719	0.6
Exploration and evaluation assets	2,880,319	12.9	2,886,220	12.8	3,121,294	13.3
Deferred tax assets	961,729	4.3	1,098,682	5.0	1,317,826	5.6
Rights to receive reimbursement from decommissioning funds	237,265	1.1	265,789	1.2	290,546	1.2
Derivative assets	83,678	0.4	49,051	0.2	825	0.0
Other non-current financial assets	870	0.0	49,636	0.0	109,824	0.5
Other non-current assets	171,316	0.8	180,094	1.0	179,692	0.8
Total Non-current Assets	17,571,991	78.8	17,409,198	77.4	19,268,519	82.2
Total Assets	22,285,281	100.0	22,493,446	100.0	23,445,187	100.0

* Reclassified to be comparable with 2021 financial statements.

PTT EXPLORATION AND PRODUCTION PUBLIC COMPANY LIMITED AND SUBSIDIARIES
STATEMENT OF FINANCIAL POSITION (cont'd)

	As at December 31, 2019 *		As at December 31, 2020 *		As at December 31, 2021	
	Thousand (USD)	%	Thousand (USD)	%	Thousand (USD)	%
Liabilities and Equity						
Current Liabilities						
Trade and other payables	888,925	4.0	893,694	4.0	1,096,946	4.7
Current portion of long-term liabilities	18,282	0.1	135,475	0.6	633,346	2.7
Income tax payable	862,953	3.9	504,785	2.2	782,837	3.3
Short-term provisions	131,500	0.6	150,218	0.7	381,144	1.6
Derivative liabilities	15,214	0.0	29,675	0.1	49,209	0.2
Other current liabilities	133,969	0.6	159,074	0.7	183,466	0.8
Total Current Liabilities	2,050,843	9.2	1,872,921	8.3	3,126,948	13.3
Non-current Liabilities						
Debentures	2,704,746	12.1	2,830,375	12.6	2,475,802	10.6
Long-term loans	593,261	2.7	594,659	2.6	596,057	2.5
Lease liabilities	125,413	0.5	371,552	1.6	388,510	1.7
Deferred tax liabilities	1,442,489	6.5	1,445,792	6.4	1,504,258	6.4
Provision for employee benefits	245,248	1.1	265,511	1.2	205,381	0.9
Provision for decommissioning costs	2,967,512	13.3	3,140,385	14.0	2,458,593	10.5
Provision for remuneration for the renewal of petroleum production	190,758	0.9	103,243	0.5	120,727	0.5
Derivative liabilities	-	-	674	0.0	8,413	0.0
Other non-current liabilities	123,837	0.6	69,216	0.3	132,279	0.6
Total Non-current Liabilities	8,393,264	37.7	8,821,407	39.2	7,890,020	33.7
Total Liabilities	10,444,107	46.9	10,694,328	47.5	11,016,968	47.0
Equity						
Share capital						
Issued and paid-up share capital	150,684	0.7	150,684	0.7	150,684	0.6
Share premium	3,439,037	15.4	3,439,037	15.3	3,439,037	14.7
Subordinated capital debentures	187,435	0.9	156,570	0.7	156,570	0.7
Retained earnings						
Appropriated						
Legal reserve	15,048	0.1	15,048	0.1	15,048	0.1
Reserve for expansion	431,231	1.9	431,231	1.9	431,231	1.8
Unappropriated	7,630,675	34.2	7,672,902	34.1	8,306,161	35.4
Other components of equity	(12,936)	(0.1)	(66,354)	(0.3)	(70,512)	(0.3)
Total Equity	11,841,174	53.1	11,799,118	52.5	12,428,219	53.0
Total Liabilities and Equity	22,285,281	100.0	22,493,446	100.0	23,445,187	100.0
Book value per share (USD)	2.98		2.97		3.13	
Issued and fully paid-up capital at the end of year (Thousand share)	3,969,985		3,969,985		3,969,985	

* Reclassified to be comparable with 2021 financial statements.

Statement of Income

PTT EXPLORATION AND PRODUCTION PUBLIC COMPANY LIMITED AND SUBSIDIARIES

STATEMENT OF INCOME

FOR THE YEARS ENDED DECEMBER 31,

	2019		2020		2021	
	Thousand (USD)	%	Thousand (USD)	%	Thousand (USD)	%
Revenues						
Revenue from sales	6,046,416	94.3	5,043,170	94.1	6,730,860	92.0
Revenue from pipeline transportation	116,396	1.8	92,350	1.7	93,147	1.3
Gain on foreign exchange rates	108,597	1.7	26,062	0.5	-	-
Gain on remeasuring of financial instruments	-	-	99,331	1.9	-	-
Gain on debt modification	-	-	22,307	0.4	-	-
Gain from a bargain purchase	-	-	-	-	341,874	4.7
Interest income	86,235	1.3	36,729	0.7	16,750	0.2
Other income	55,391	0.9	37,012	0.7	131,594	1.8
Total Revenues	6,413,035	100.0	5,356,961	100.0	7,314,225	100.0
Expenses						
Operating expenses	750,682	11.7	795,112	14.8	861,495	11.8
Exploration expenses	128,098	2.0	104,314	1.9	226,252	3.1
Administrative expenses	383,776	6.0	314,117	5.9	355,039	4.9
Petroleum royalties	546,334	8.5	410,154	7.7	530,215	7.2
Depreciation, depletion and amortisation	2,026,056	31.6	2,086,083	38.9	2,202,064	30.1
Loss on foreign exchange rates	-	-	-	-	37,592	0.5
Loss on remeasuring of financial instruments	109,400	1.7	-	-	234,290	3.2
Impairment loss on assets and goodwill	-	-	91,576	1.7	183,000	2.5
Other expenses	-	-	20,341	0.4	-	-
Finance costs	234,979	3.7	254,476	4.8	202,226	2.8
Total Expenses	4,179,325	65.2	4,076,173	76.1	4,832,173	66.1
Share of profit of associates and joint ventures	12,352	0.2	41,636	0.8	15,174	0.2
Profit before income taxes	2,246,062	35.0	1,322,424	24.7	2,497,226	34.1
Income taxes	(676,998)	(10.5)	(602,880)	(11.3)	(1,286,688)	(17.6)
Profit for the year	1,569,064	24.5	719,544	13.4	1,210,538	16.5
Basic earnings per share (USD)	0.38		0.18		0.30	

Statement of Cash Flows

PTT EXPLORATION AND PRODUCTION PUBLIC COMPANY LIMITED AND SUBSIDIARIES
STATEMENT OF CASH FLOWS
FOR THE YEARS ENDED DECEMBER 31,

	2019	2020	2021
	Thousand (USD)	Thousand (USD)	Thousand (USD)
Cash flows from operating activities			
Profit before income taxes	2,246,062	1,322,424	2,497,226
Adjustments for:			
Share of profit of associates and joint ventures	(12,352)	(41,636)	(15,174)
Depreciation, depletion and amortisation	2,026,056	2,086,083	2,202,064
Allowance for impairment loss on assets and goodwill	-	91,576	183,000
Allowance (reversal) for decrease in value of inventories to net realisable value	(1,364)	474	(882)
Write-off of exploration expenses	76,756	62,140	214,928
Other amortised expenses	32,050	10,208	10,976
Loss on disposal of assets	19,049	24,215	2,256
Income recognised from deferred income	(3,541)	(2,550)	(3,104)
(Gain) loss on remeasuring financial instruments	57,850	43,649	(15,718)
(Gain) loss on foreign exchange rates	(8,014)	(10,229)	9,132
Other provisions	8,133	-	-
Interest income lower than interest expenses	147,107	212,035	177,752
Gain from a bargain purchase	-	-	(341,874)
Gain on debt modification	-	(22,307)	-
Other income	-	-	(81,276)
Other expenses	35,252	37,371	19,176
	4,623,044	3,813,453	4,858,482
Changes in working capital	(1,103,438)	(1,041,953)	(1,430,174)
Net cash flows provided by operating activities	3,519,606	2,771,500	3,428,308
Cash flows from investing activities			
Cash paid for short-term investments	(744,750)	(100,000)	-
Cash received from investing in short-term investments	1,365,410	200,000	100,000
Cash paid for investment in other financial assets	(36)	-	-
Cash received from investment in other financial assets	10,444	-	-
Cash received from long-term loans to related parties	10,801	11,086	33,170
Dividend received from related parties	14,716	26,807	40,746
Net cash paid for business acquisition	(2,713,300)	-	(2,299,492)
Net cash received from asset acquisition	-	-	11,968
Net cash paid for expense related to divestment of asset	(19,627)	-	-
Cash paid for contingent considerations from participating interest	-	-	(54,670)
Cash received from investment in joint venture	-	393	-
Cash paid for investment in associate and joint ventures	(79,412)	(3,138)	(15,506)
Cash received from lease receivables	-	378	374
Interest received from short-term investments	15,376	5,842	1,850
Interest received from loans to related parties	5,218	2,277	1,010
Increase in property, plant and equipment	(1,063,093)	(1,093,140)	(1,512,174)
Increase in intangible assets	(26,147)	(28,466)	(29,067)
Increase in exploration and evaluation assets	(119,228)	(93,651)	(131,574)
Net cash flows used in investing activities	(3,343,628)	(1,071,612)	(3,853,365)

PTT EXPLORATION AND PRODUCTION PUBLIC COMPANY LIMITED AND SUBSIDIARIES

STATEMENTS OF CASH FLOWS (cont'd)

FOR THE YEARS ENDED DECEMBER 31,

	2019	2020	2021
	Thousand (USD)	Thousand (USD)	Thousand (USD)
Cash flows from financing activities			
Cash received from short-term loans	259,581	-	200,000
Cash paid for repayment of short-term loans	(258,826)	-	(200,000)
Cash paid for repayment of debentures	(418,199)	(730,443)	-
Cash received from issuance of debentures	1,130,045	850,000	179,960
Cash received from long-term loans	600,000	-	-
Cash paid for finance cost from issuance of debentures and long-term loans	(7,613)	(9,945)	(270)
Cash paid for lease liabilities	(7,785)	(96,362)	(128,482)
Interest paid	(109,932)	(147,594)	(133,914)
Cash paid for redemption of subordinated capital debentures	(990,846)	(30,852)	-
Interest paid for subordinated capital debentures	(53,611)	(10,126)	(9,138)
Net cash received from financial derivative contracts	1,353	-	1,826
Dividends paid	(697,760)	(671,000)	(605,341)
Net cash flows used in financing activities	(553,593)	(846,322)	(695,359)
Net increase (decrease) in cash and cash equivalents	(377,615)	853,566	(1,120,416)
Cash and cash equivalents at the beginning of the year	3,180,095	2,822,897	3,704,003
	2,802,480	3,676,463	2,583,587
Adjustment for the impact of exchange rate changes	20,417	27,540	(24,398)
Cash and cash equivalents at the end of the year	2,822,897	3,704,003	2,559,189

Significant Financial Ratio Summary Table

			2019	2020	2021
Liquidity ratio					
Current Ratio	Times		2.30	2.71	1.34
Quick Ratio	Times		1.86	2.45	1.07
Cash Flow from Operations to Current Liabilities Ratio	Times		1.55	1.41	1.37
Account Receivable Turnover	Times		8.12	7.52	9.97
Account Payable Turnover	Times		7.20	6.70	5.89
Collection Period *	Days		45	49	37
Day Payable *	Days		51	55	62
Profitability Ratio					
Net Profit Margin	%		24.47	13.43	16.55
Return on Equity	%		13.16	6.09	9.99
Efficiency Ratio					
Return on Assets	%		7.51	3.21	5.27
Return on Fixed Assets	%		28.72	20.77	23.95
Assets Turnover	Times		0.31	0.24	0.32
Financial Policy Ratio					
Debt to Equity Ratio	Times		0.29	0.33	0.33
Net Debt to Equity Ratio	Times		0.04	0.01	0.12
Times Interest Earned	Times		18.53	13.80	24.71
Dividend Ratio	%		49	77	50
Data per Share					
Book Value per Share	USD		2.98	2.97	3.13
Net Profit per Share	USD		0.38	0.18	0.30
Dividend per Share	THB		6.00	4.25	5.00
Growth Rate					
Total Asset	%		13.95	0.93	4.23
Total Liabilities	%		38.53	2.40	3.02
Sales	%		16.05	(16.67)	32.88
Net Profit	%		40.14	(54.14)	68.24

* Collection Period and Day Payable are in range of credit term of PTTEP's Group

5. General Information and Other Significant Information

5.1 References

(1) Share Registrar

1.1)	Name	Thailand Securities Depository Company Limited
	Address	93, Ratchadaphisek Road, Din Daeng, Bangkok 10400, Thailand
	Telephone	SET Contact Center: +66-2009-9999
	Website	http://www.set.or.th/tsd

(2) Registrar and Paying Agent

- 2.1) Registrar and paying agent for THB 5,000 million subordinated perpetual capital debentures issued in June 2012.

Name	TMB Thanachart Bank Public Company Limited
Address	3000 Phahon Yothin Road, Chomphon, Chatuchak, Bangkok 10900, Thailand
Telephone	+66-2299-1825, +66-2299-1830
Facsimile	+66-2242-3270

- 2.2) Registrar and paying agent for THB 11,400 million debentures issued in June 2014, and THB 15,000 million debentures issued in June 2019.

Name	Siam Commercial Bank Public Company Limited
Address	15 th Floor, North Wing, G Tower Grand Rama 9, Rama 9 Road, Huai Khwang, Huai Khwang, Bangkok 10310, Thailand
Telephone	+66-2128-2324, 2326-9, 3540
Facsimile	+66-2128-4625

- 2.3) Registrar and paying agent for THB 6,000 million debentures issued in November 2021.

Name	Krungthai Bank Public Company Limited
Address	977/2 SM Tower, 3 rd Floor, Phahon Yothin Road, Samsen Nai, Phaya Thai, Bangkok 10400, Thailand
Telephone	+66-2298-0828 ext. 111
Facsimile	+66-2128-4625

(3) Debenture Holders' Representative

- 3.1) Debenture holders' representative for THB 5,000 million subordinated perpetual capital debentures issued in June 2012.

Name	Siam Commercial Bank Public Company Limited
Address	15 th Floor, North Wing, G Tower Grand Rama 9, Rama 9 Road, Huai Khwang, Huai Khwang, Bangkok 10310, Thailand

Telephone +66-2128-2324, 2326-9, 3540

Facsimile +66-2128-4625

- 3.2) Debenture holders' representative for THB 6,000 million debentures issued in November 2021.

Name Krungthai Bank Public Company Limited

Address 977/2 SM Tower, 3rd Floor, Phahon Yothin Road, Samsen Nai, Phaya Thai, Bangkok
10400, Thailand

Telephone +66-2298-0828 ext. 111

Facsimile +66-2128-4625

(4) Trustee

- 4.1) Trustee for outstanding USD 650 million debentures issued in December 2019, outstanding USD 350 million debentures issued in January 2020, and outstanding USD 500 million debentures issued in June 2020.

Name BNY Mellon Corporate Trust

Address #02-01 Millenia Tower, 1 Temasek Avenue, Singapore 039192

Telephone +65-6432-0351, +65-6432-4147

Facsimile +65-6883-0338

- 4.2) Trustee for outstanding USD 490 million debentures issued in June 2012.

Name CITICORP INTERNATIONAL LIMITED

Address 20th Floor, Citi Tower, One Bay East, 83 Hoi Bun Road, Kwun Tong, Hong Kong

Telephone +852-2868-7964, 7982

Facsimile +852-2323-0279

(5) Facility Agent

- 5.1) Facility agent for USD 600 million loan agreement dated in June 2019.

Name DBS Bank Ltd.

Address 2 Changi Business Park Crescent, DBS Asia Hub Lobby B #04-06, Singapore 486029

Telephone +65-6682-9485, +65-6878-7650

Facsimile +65-6324-4427

(6) Process Agent

- 6.1) Process agent for USD 600 million loan agreement dated in June 2019, USD 200 million Committed Revolving Credit Facilities dated in September 2020 and USD 200 million Committed Revolving Credit Facilities dated in October 2020.

Name Law Debenture Corporate Services Limited

Address 8th Floor, 100 Bishopsgate, London, EC2N 4AG

Telephone +44-(0)20-7606-5451

Facsimile +44-(0)20-7606-0643

6.2) Process Agent for Common Shares

Name CT Corporation System
Address 28 Liberty Street, New York, New York 10005
Telephone +1-212-894-8800
Facsimile -

(7) Cross Currency Swap and Zero-Cost Collar Counterparties

- 7.1) **Name** Siam Commercial Bank Public Company Limited
Division Financial Market Division
Address 12th Floor, Zone B, 9 Ratchadaphisek Road, Chatuchak, Bangkok 10900, Thailand
Telephone +66-2544-5741-9
Facsimile +66-2937-7968
- 7.2) **Name** The Hongkong and Shanghai Banking Corporation Limited, Bangkok Branch
Division Global Markets
Address HSBC Building, 968 Rama IV Road, Silom, Bang Rak, Bangkok 10500, Thailand
Telephone +66-2614-4847
Facsimile +66-2353-7333
- 7.3) **Name** Krung Thai Bank Public Company Limited
Division Markets Solutions and Innovation Team, Global Markets Group
Address Building 1 (Nana Nuea), 8th Floor, 35 Sukhumvit Road,
Khlong Toei Nuea, Watthana, Bangkok 10110, Thailand
Telephone +66-2208-4699
Facsimile +66-2256-8398
- 7.4) **Name** ANZ Bank (Thai) Public Company Limited
Division Markets
Address 63 Athenee Tower, 8th Floor, Unit 801-804,
Wireless Road, Lumpini, Pathum Wan, Bangkok 10330, Thailand
Telephone +66-2263-9722
Facsimile +66-2168-8780

(8) FX Contracts Counterparties

- 8.1) **Name** Kasikornbank Public Company Limited
Division Capital Markets Business Division
Address 400/22 Phahon Yothin Avenue, Samsen Nai, Phaya Thai,
Bangkok 10400, Thailand
Telephone +66-2470-3006
Facsimile +66-2271-4486

- 8.2) **Name** Krung Thai Bank Public Company Limited
Division Markets Solutions and Innovation Team, Global Markets Group
Address Building 1 (Nana Nuea), 8th Floor, 35 Sukhumvit Road,
 Khlong Toei Nuea, Watthana, Bangkok 10110, Thailand
Telephone +66-2208-4699
Facsimile +66-2256-8398
- 8.3) **Name** Siam Commercial Bank Public Company Limited
Division Financial Market Division
Address 12th Floor, Zone B, 9 Ratchadaphisek Road,
 Chatuchak, Bangkok 10900, Thailand
Telephone +66-2544-5741-9
Facsimile +66-2937-7968
- 8.4) **Name** Bank of America, N.A., Bangkok Branch
Division Fixed Income Currencies and Commodities (FICC) Sales
Address 87/2 All Seasons Place, CRC Tower, 33rd Floor,
 Wireless Road, Lumpini, Pathum Wan, Bangkok 10330, Thailand
Telephone +66-2305-2986
Facsimile +66-2685-3224
- 8.5) **Name** Citibank, N.A. (Thailand)
Division Global Markets Thailand
Address Interchange 21 Building, 399 Sukhumvit Road,
 Khlong Toei Nuea, Watthana, Bangkok 10110, Thailand
Telephone +66-2079-2222
Facsimile +66-2079-4342
- 8.6) **Name** CIMB Thai Bank Public Company Limited
Division Treasury Sales, Treasury & Markets
Address 44 Langsuan Road, Lumpini, Pathum Wan,
 Bangkok 10330, Thailand
Telephone +66-2670-4623
Facsimile +66-2657-3282-3
- 8.7) **Name** Bank of Ayudhya Public Company Limited
Division Global Corporate Banking Division
Address 550 Phloen Chit Road, Lumpini, Pathum Wan, Bangkok 10330, Thailand
Telephone +66-2296-2000
Facsimile +66-2296-6921

8.8)	Name	Bangkok Bank Public Company Limited
	Division	Treasury Division
	Address	333 Silom Road, Silom, Bang Rak, Bangkok 10500, Thailand
	Telephone	+66-2021-1111
	Facsimile	+66-2636-4633
8.9)	Name	TMB Thanachart Bank Public Company Limited
	Division	Global Markets
	Address	3000 Phahon Yothin Road, Chatuchak, Bangkok 10900, Thailand
	Telephone	+66-2676-8008
	Facsimile	+66-2292-4690-2
8.10)	Name	Deutsche Bank AG, Filiale Bangkok
	Division	Risk Management Solutions
	Address	Athenee Tower, 63 Wireless Road, Lumpini, Pathumwan, Bangkok 10330, Thailand
	Telephone	+66-2646-5138
	Facsimile	+66-2651-5892
8.11)	Name	BNP Paribas Bangkok Branch
	Division	Global Markets & ALM Treasury
	Address	990 Abdulrahim Place, 29 th Floor, Rama IV Road, Silom, Bang Rak Bangkok 10500, Thailand
	Telephone	+66-2659-8990
	Facsimile	+66-2636-1929
8.12)	Name	United Overseas Bank (Thai) Public Company Limited
	Division	Global Markets
	Address	191 South Sathon Road, Yannawa, Sathon, Bangkok 10120, Thailand
	Telephone	+66-2343-4381-4
	Facsimile	+66-2285-1365
8.13)	Name	J.P. Morgan Chase Bank N.A.
	Division	Currencies and Emerging Markets
	Address	20 Bubbajit Building, 2 nd Floor, North Sathon Road, Silom, Bang Rak, Bangkok 10500, Thailand
	Telephone	+66-2684-2257
	Facsimile	+66-2684-2260

- 8.14) **Name** ANZ Bank (Thai) Public Company Limited
Division Markets
Address 63 Athenee Tower, 8th Floor, Unit 801-804,
Wireless Road, Lumpini, Pathum Wan, Bangkok 10330, Thailand
Telephone +66-2263-9722
Facsimile +66-2168-8780
- 8.15) **Name** The Hongkong and Shanghai Banking Corporation Limited, Bangkok Branch
Division Global Markets
Address HSBC Building, 968 Rama IV Road, Silom, Bang Rak, Bangkok 10500, Thailand
Telephone +66-2614-4847
Facsimile +66-2353-7333
- 8.16) **Name** Sumitomo Mitsui Banking Corporation
Division Treasury Department
Address 8th-10th Floor, Q.House Lumpini Building
1 South Sathon Road, Bangkok 10120, Thailand
Telephone +66-2353-8196-7
Facsimile +66-2343-8815-16
- (9) **Auditor**
Name Ms. Amornrat Pearmpoonvatanasuk
Certified Public Accountant No. 4599
PricewaterhouseCoopers ABAS Ltd.
Address 15th Floor, Bangkok City Tower,
179/74-80 South Sathon Road, Bangkok 10120, Thailand
Telephone +66-2844-1000
Facsimile +66-2286-5050
- (10) **Legal Advisors**
10.1) **Name** Baker & McKenzie Ltd.
Address 990 Abdulrahim Place, 25th Floor, Rama IV Road, Silom, Bang Rak
Bangkok 10500, Thailand
Telephone +66-2666-2824
Facsimile +66-2666-2924
10.2) **Name** Rouse & Co International (Thailand) Co., Ltd.
Address Unit 1401-3 and 1408, 14th Floor, Two Pacific Place
142 Sukhumvit Road, Khlong Toei, Bangkok 10110, Thailand
Telephone +66-2653-2730
Facsimile +66-2653-2734

10.3)	Name	Linklaters (Thailand) Ltd.
	Address	20 th Floor, Capital Tower, All Seasons Place, 87/1 Wireless Road, Bangkok 10330, Thailand
	Telephone	+66-2305-8000
	Facsimile	+66-2305-8010
10.4)	Name	Weerawong, Chinnavat & Partners Ltd.
	Address	22 nd Floor, Mercury Tower 540, Phloen Chit Road, Lumpini, Pathum Wan, Bangkok 10330, Thailand
	Telephone	+66-2264-8000
	Facsimile	+66-2657-2222
10.5)	Name	Satit & Partners Co., Ltd.
	Address	2/115 Bangna Complex Office Tower, 21 st Floor Soi Bang Na-Trat 25, Bang Na Nuea, Bang Na, Bangkok 10260, Thailand
	Telephone	+669-1017-3452
	Facsimile	-
10.6)	Name	Siam Premier International Law Office Limited
	Address	26 th Floor, The Offices at Central World, 999/9 Rama I Road, Pathum Wan, Bangkok 10330, Thailand
	Telephone	+66-2646-1888
	Facsimile	+66-2646-1919
10.7)	Name	Atthaworadej & Associates Co., Ltd.
	Address	12 th Floor, Srijulsup Tower 44 Rama 1 Road, Pathum Wan, Bangkok 10330, Thailand
	Telephone	+66-2613-9449
	Facsimile	-
10.8)	Name	Allen & Overy (Thailand) Co., Ltd.
	Address	23 rd Floor, Sindhorn Building Tower 3, 130-132 Wireless Road Lumphini, Pathum Wan, Bangkok 10330, Thailand
	Telephone	+66-2263-7600
	Facsimile	+66-2263-7699
10.9)	Name	Intellectual Design Group (IDG) Co., Ltd.
	Address	194,196 Nonthaburi Road, Bang Kraso, Mueang Nonthaburi, Nonthaburi 11000, Thailand
	Telephone	+66-2011-7161-6
	Facsimile	-

- 10.10) **Name** Ariff Rozhan & Co.
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Telephone +603-6411-4001
Facsimile +603-6419-0987
- 10.11) **Name** Azman Davidson & Associates
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Kuala Lumpur, Malaysia
Telephone +603-2118-5121
Facsimile +603-2118-5111
- 10.12) **Name** Bennett Jones LLP
Address 4500 Bankers Hall East 855 – 2nd Street SW, Calgary, Alberta,
T2P 4K7 Canada
Telephone +403-298-3100
Facsimile +403-265-7219
- 10.13) **Name** Frasers Law Company
Address Unit 19.01, 19th Floor, Deutsches Haus
33 Le Duan Boulevard, District 1, Ho Chi Minh City, Vietnam
Telephone +8428-3824-2733
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- 10.14) **Name** Gibson, Dunn & Crutcher LLP
Address One Raffles Quay, Level #37-01, North Tower, Singapore 048583
Telephone +656-507-3685
Facsimile +656-507-3650
- 10.15) **Name** Henrique Abecasis, Andresen Guimarães &
Associados - Sociedade de Advogados, SP, RL (HAAG)
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- 10.16) **Name** Herbert Smith Freehills
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- 10.17) Name Herbert Smith Freehills LLP
 Address 50 Raffles Place, #24-01 Singapore Land Tower, Singapore 048623
 Telephone +65-6868-8000
 Facsimile +65-6868-8001
- 10.18) Name Jones Day
 Address 138 Market Street, Level 28 Capita Green, Singapore 048946
 Telephone +65-6538-3939
 Facsimile +65-6538-3939
- 10.19) Name José Carlos de Oliveira & Associados - Sociedade de Advogados, RL
 Address Av. João XXI, n.º 16 - 1º Dto., 1000-302 Lisboa
 Telephone +351-218-498-813
 Facsimile +351-218-473-153
- 10.20) Name Latham & Watkins LLP
 Address 9 Raffles Place, #42-02 Republic Plaza, Singapore 048619
 Telephone +65-6536-1161
 Facsimile +65-6536-1171
- 10.21) Name Lau, Horton & Wise LLP in Association with CMS Hasche Sigle,
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(11) Advisor to the Board of Directors

-None-

5.2 Other Significant Information

Other information that has a significant impact on Investors' Decision

-None-

Restrictions on Foreign Shareholders

-None-

5.3 Legal Dispute

As of December 31, 2021, the outstanding legal dispute which PTTEP or one of the Company's subsidiaries is a party involved as well as which can significantly affect our operation or the subsidiary's, excluding dispute from the normal operation and circumstance, is as follows:

PTTEP Australasia (Ashmore Cartier) Pty Ltd. (PTTEP AAA) was sued for damages at the Federal Court of Australia by a group of Indonesian seaweed farmers.

On August 3, 2016, a group of Indonesian seaweed farmers filed a lawsuit against PTTEP AAA at the Federal Court of Australia, claiming for the damages caused by the 2009 Montara incident in Australia. The lawsuit was filed after the lapse of the period of prescription for claims and did not state the amount of claim. However, the Federal Court of Australia has granted an extension of the limitation period due to certain legal exceptions on November 15, 2017.

On March 19, 2021 and October 25, 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 November 15, 2021. The court determined the damages caused only to the lead plaintiff of the class action of approximately Indonesian Rupiah 253 million or equivalent to USD 0.02 million (Baht 0.59 million). Interest payable on these damages was agreed to be approximately Indonesian Rupiah 165 million or equivalent to USD 0.01 million (Baht 0.39 million) up until December 31, 2021. Claims of all the class members are presently statute barred and must be determined separately. On December 13, 2021, PTTEP AAA exercised its right to file a Notice of Appeal in the Federal Court of Australia. As of December 31, 2021, the case was still under the court proceeding.

PTTEP and PTTEP AAA continue to maintain the position, based on independent scientific researches overseen by the Australian Government, that no oil from Montara reached the shores of Australia or Indonesia, that there is no lasting impact on the ecosystems and biodiversity in Australian waters in the areas immediate to Indonesian waters, and that there is no long-term damage to the environment in the Timor Sea.

5.4 Secondary Market in Case of Listing on the Stock Exchange of Other Countries

-None-



Corporate Governance

6. Corporate Governance

6.1 Good Corporate Governance Policy

PTTEP's Board of Directors (Board) places importance on PTTEP's and its subsidiaries' (PTTEP Group) operations to comply with the Good Corporate Governance and Business Ethics of PTTEP Group (CG&BE) in order to grow sustainably and enhance the confidence of all of our shareholders and other stakeholders which will lead the Company to ultimately achieve its vision as Energy Partner of Choice. Furthermore, the Board has assigned the Corporate Governance and Sustainable Development Committee (CG&SD Committee) to oversee and assure that the Company's operations are in line with the CG&BE Principles and that good corporate governance is always maintained at the level of international standards. The CG&SD Committee also regularly monitors and assesses the implementation of CG&BE and ensures its integration into everyone's work. In 2021, the Board of Directors paid attention to the development plan and targets of Sustainable Development Framework, which comprises Governance, Risk Management and Compliance (GRC), as a key component of the Framework, to respond to current situations, global trends, technology development and be ready for future challenges. PTTEP continues improvement in corporate governance and promotes its business ethics during Work from Home in every PTTEP operations sites, e.g. the development of CG&BE Report System for online reporting of conflict of interest and online signing of CG&BE commitment form for new staff and PTTEP stakeholders survey for their perspectives toward GRC. With its commitment to the ongoing development of good corporate governance, the Company earned various recognitions for our good corporate governance, domestically and internationally. Details are disclosed under the "Awards and Recognitions for Good Corporate Governance" topic.

The Board has reviewed the implementation of the Corporate Governance Code 2017 (CG Code), which was established by the Securities and Exchange Commission through means that are suitable to the Company's business. The Board assigned the Corporate Governance and Sustainable Development Committee to ensure CG Code compliance and its appropriate implementation, so as to maximize value in regard to the Company's future and sustainable growth. PTTEP has continued to develop and apply the CG Code principles together with internationally recognized best practices as follows:

6.1.1 Policy on Treatment to the Board

The details are disclosed in "Governance Structure and Key Data on the Board of Directors, Specific Committees, Management, Employees and Others" and "Corporate Governance Milestones" sections.

6.1.2 Policy on Treatment to Shareholders and Stakeholders

The Board has approved PTTEP's mission which puts an emphasis on the right and value creation for all stakeholders. The Company's mission is to operate globally to provide a reliable energy supply and sustainable value to all stakeholders. In practice, the Company cares for the rights of all stakeholders, including but not limited to, shareholders, customers, employees, governments, joint venture partners, communities, suppliers, creditors, competitors, and also concerns about the environment, custom and tradition, and human rights. The importance of the Company's stakeholders is clearly written in the PTTEP Group's CG&BE in which practical guidelines with respect to business ethics are established with an effort to balance duties and responsibilities between the Company and our stakeholders. Details of the CG&BE, contact details, whistleblowing channels are disclosed on the Company's website. The details of policy on treatment to stakeholders are as follows:

(1) Shareholders

PTTEP recognizes and values the importance of the shareholders' rights and equal treatment; thus we have specified the Company's Good Corporate Governance as one of our principles to ensure that our shareholders' basic rights are protected and honored. This includes the right to trade and transfer shares, declaration of share ownership, and the right to attend shareholders' meetings in person or through their proxies alongside the right to participate in and vote on significant issues presented by the Board at the Company's shareholder meetings, such as the election of new members of the Board to replace those due to retirement by rotation, determination of the Board's remuneration of any kinds, appointment and approval of external auditors and the auditor's fees, approval of connected transactions, acquisition or disposition of material assets as required by the laws, and other issues which are of significance to the Company. The Shareholders are also entitled to receive profit sharing in the form of dividends as well as to obtain equal and adequate information from the Company in a timely manner. The Company has only one class of ordinary shares on which one share has one vote equally. Our efforts to ensure and enhance the Shareholders' rights also include the following:

1.1) Annual General Meeting of Shareholders

PTTEP respected and promoted shareholders' rights in its Annual General Meeting of Shareholders (hereafter referred to as AGM or the Meeting) in 2021, through the following actions:

Before the Meeting

1) Shareholders were invited to propose agenda items and nominate qualified candidates for the election of PTTEP directors prior to the AGM from August 31 to November 30, 2020. The criteria were announced publicly through the Stock Exchange of Thailand (SET) and the Company's website. The Shareholders' proposals were considered based on the Company's established criteria to ensure that the proposed agenda items were relevant and truly beneficial to the business of the PTTEP Group. The Nominating and Remuneration Committee was responsible for screening and short-listing the nominated candidates for the Board's consideration. Thereafter, the Board informed the Shareholders of the resolution together with the rationale for each of the proposals at the AGM. In 2021, no such agenda or any director candidates were proposed by the shareholders.

2) PTTEP announced the date for the 2021 AGM approximately 2 months prior to the date of the Meeting as soon as the Board resolved on February 15, 2021, and approved the date for the AGM on Thursday, April 8, 2021, and the date on which the Shareholders would have the right to attend the Meeting as well as to receive dividends which was on March 2, 2021, through the SET and the Company's website.

3) The AGM invitation letter and supplementary documents, in both Thai and English, were published on the Company's website on March 5, 2021, which was 34 days prior to the Meeting. The Invitation Letter has necessary details of each agenda, which clearly stated the types of agenda items whether for acknowledgment or approval. The Board's opinions on each agenda item were clearly stated along with other rules and regulations related to the Meeting. A proxy form (to preserve their rights to attend the Meeting) as stipulated by the Ministry of Commerce, was enclosed in the Invitation Letter along with the list of required documents that the Shareholders needed to bring to the Meeting, instructions of the Meeting, and a map of the venue. The AGM invitation letter and supplementary documents were distributed to the Shareholders by postal service 21 days prior to the Meeting.

4) PTTEP provided the names of three independent directors in the Proxy Form to provide the Shareholders an option to appoint one of them as their proxy. The Company also informed the Shareholders about the stake of the independent directors on each of the agenda items, for instance, to elect new directors replacing those due to retirement by rotation, an independent director whose term was completed but re-nominated for another term would be considered as having vested interests (but not being considered a special interest) or on the agenda item to approve the remuneration of the Board. The directors who would be considered as having a special interest were excluded from the voting regardless of their shareholding. The Company also recommended that the Shareholders use the proxy form, through which they could specify their votes on each agenda item.

5) The Company also invited the Shareholders to submit questions related to the Agenda Items of the Meeting or other information relevant to the Company prior to the Meeting. This action helped to make the Meeting more efficient and beneficial to the Shareholders. Such questions were consolidated and answered at the AGM as well as recorded in the Minutes of the Meeting.

At the Meeting

1) The Meeting was held on Thursday, April 8, 2021, at 9.30 hrs. at Bangkok Convention Center, 5th Floor, Central Plaza Ladprao (Plaza Zone), No. 1695 Phahonyothin Road, Chatuchak, Bangkok. The Meeting date, time, and venue were determined in consideration of all shareholders' convenience and the situation of the COVID-19 pandemic. Barcode systems and technology were used at the Meeting for registration, vote counting, compilation, and display of resolutions to ensure that the Meeting was carried out with full efficiency and accuracy. Supporting persons were adequately arranged to facilitate the Meeting. To accelerate the registration process, the registration was opened to the Shareholders 2 hours prior to the Meeting. The Company also prepared and provided duty stamps to the Shareholders who intended to vote through proxies.

2) All 15 PTTEP directors attended the Meeting. The Company's Chairman of the Board presided over the Meeting, while the sub-committee chairmen, the President and the Chief Executive Officer, senior executives from the Finance and Accounting Group, and other function groups also participated in responding and providing clarifications on the inquiries brought by the Shareholders. The external auditor, external legal advisors from Weerawong, Chinnavat & Partners Ltd., shareholders' right protection volunteers from the Thai Investor Association and volunteers from shareholders to witness vote counting, also participated in the Meeting. The Chairman ensured that the Meeting was carried out in accordance with the Company's Articles of Association and the agenda items as per sequence stated in the invitation letter, without adding any other agenda item. The Chairman efficiently allocated time to each agenda item (no special agenda raised at the Meeting) and provided adequate time and opportunities for them to share their views and make in-depth inquiries in regard to those subjects relating to the Company's operations and the Meeting's agenda items prior to vote casting and passing resolution.

3) PTTEP clearly provided useful information such as the number and ratio of the Shareholders who attended the Meeting both in person and by proxies, including the Meeting procedures, vote casting, vote counting before the commencement as stipulated in the Articles of Association of PTTEP. The Shareholders and proxies were required to use voting ballots to vote on each agenda item that was scheduled for discussion at the Meeting whether to agree, disagree, or abstain through a barcode system to ensure accuracy and efficiency. Each resolution was clearly reported and displayed

in the Meeting as required by relevant laws and the Company's Articles of Association, and volunteers who were selected from the Shareholders and independent inspectors were to be appointed to witness and inspect the Vote counting. The Company also kept all the Voting ballots collected, counted, and signed by the witnesses for internal reviews and reference.

The Company permitted shareholders who reached the Meeting late to cast their votes on the agenda items that were in the consideration process or had not been considered or voted on at the time of their arrival. These shareholders were also counted as participants in the Meeting, starting from the agenda item when they registered and attended the Meeting.

4) All information presented at the Meeting was available in both Thai and English, while a translator from Thai to English for foreign shareholders who attended the Meeting was also provided to ensure fairness and equality among all Shareholders.

5) External independent legal advisors, acting as inspectors as well as witnesses, were engaged to oversee the Meeting to ensure the Meeting's transparency and that it was conducted lawfully and in accordance with the Articles of Association of PTTEP including but not limited to meeting procedures as informed by the Chairman of the Meeting, verifying the documents and the proxy examination process, ensuring a quorum as well as assuring the Meeting that none of shareholders with potential conflicts of interest cast votes on such agenda items, and making sure that the voting procedures, vote counting ballot collection from the attending shareholders, and auditing of the resolution and result of the vote counting were done correctly.

After the Meeting

1) PTTEP disclosed the Minutes of the Meeting together with the vote counting results for each agenda item disseminated to the SET and also on the Company's website immediately after the Meeting.

2) Minutes of the Meeting, in both Thai and English, were accurately and completely recorded. They covered explanations of the Meeting's voting and vote counting procedures, details of agenda items, questions/answers, explanations and opinions related to PTTEP's business operations, and the Meeting's agenda. The Company also kept in record the resolution on each agenda item, categorized them as agreed, disagreed, abstained, and voided (if any) as well as the names and positions of the directors and executives who attended the Meeting. Furthermore, the final version of the Minutes of the Meeting was delivered to the Ministry of Commerce, SET, and the Office of the Securities and Exchange Commission (SEC) within 14 days after the Meeting. The Minutes of the Meeting were also delivered to the Company's shareholders for their reference and consideration, and for verifying that any shareholders who wished to make objections did so within the timeframe enforced by relevant laws. In 2021, the Company did not receive any objections or inquiries from the Shareholders in regard to vote counting results and the Minutes of the Meeting. The approved Minutes, video, and audio clips of the Meeting were also published in both Thai and English on the Company's website.

1.2) Disclosure of Significant Material Information

PTTEP ensures that information will be communicated to the Shareholders accurately and in a timely manner, not only for the information that is required by related regulations, but also for other information which the Company considers as necessary for the Shareholders to have. These disclosures are publicized through various channels, such as the SET and the Company's website, and media or printed media.

Furthermore, the Company clearly discloses the shareholding structures in our subsidiaries and associated companies as well as with the controlling shareholder, namely PTT, to ensure the Shareholders that our organization's structure is transparent, verifiable, and does not comprise any form of cross or pyramidal shareholding structures.

1.3) Fostering Understanding of Business Operations and Long-Term Engagement with Shareholders

PTTEP continuously organizes various activities for the benefit of shareholders and society. The main objectives of such activities are, for shareholders and other persons interested in PTTEP, to enhance the knowledge and understanding of exploration and production of petroleum business which is distinct from other businesses as well as participating in our CSR program. In addition, we aim to foster a high level of confidence to investors to maintain long-term investment with PTTEP. These activities include the shareholders' visit to our operation sites and CSR projects which are organized annually. However, due to the COVID-19 pandemic, the Company decided to put on hold these activities this year.

PTTEP prepares and publishes a quarterly newsletter as an additional channel to communicate PTTEP's news. This includes the Company's performance, the progress of key projects, Corporate Social Responsibility (CSR) activities, and corporate governance activities, and other useful information; for example, the three keywords ESG to sustainability, the Company's implementation to become a sustainable organization, the good corporate governance trends in 2021, What does good "ESG" disclosure look like?, Get ready for PDPA in PTTEP's way, Major Steps Strengthen PTTEP's Portfolio in Malaysia, What to do when individual $\neq$ the Company benefits, The Bongkot South Field, a vital source of energy supply for Thais, Story with 8 Developers from ARV Xterlizer, GRC in PTTEP Style and Telemedicine: Growing Health Trend Physically Apart But Digitally Close to Doctors. The quarterly newsletter was publicized on the Company's website as well as sent hard copies and E-Newsletter to the Shareholders upon request.

1.4) Equal Treatment to Shareholders

PTTEP provides a direct communication channel to all our shareholders via our independent directors' e-mail at IndependentDirector@pttep.com for various issues, such as activities of the directors, good corporate governance, and audit-related issues. In addition, the Shareholders can directly contact the Company Secretary at CorporateSecretary@pttep.com or Investor Relations Unit at IR@pttep.com for additional information. The Company operates businesses with optimal efficiency, with commitment to business ethics for sustainable growth of the Organization, appropriate and consistent returns to the Shareholders, and all stakeholders are properly and sustainably managed using modern and well-accepted management and monitoring tools.

1.5) Prevention of Insider Trading

PTTEP puts a great emphasis on controlling the use of our internal information by including this matter in the PTTEP Good Corporate Governance and Business Ethics. In line with securities laws, policies relating to the use of internal information are regularly reviewed to preserve integrity and equality among all of the Company's stakeholders. Key measures are as follows:

- 1) The Board of Directors has assigned the Governance, Compliance, Internal Control, and Subsidiary Management Department as the center for monitoring the insider trading prevention program and preparing a list of personnel who bear material and/or internal information (Insider List) which includes directors, related executives, and employees.

2) The directors, management, and employees are always informed of PTTEP's regulations and policies in regard to insider trading prevention through various communications as well as trainings to ensure that they understood and strictly followed to prevent misuse of information which may directly or indirectly conflict with his or her personal interests. Disciplinary actions are clearly specified, while the supervisors, who act as the CG Leader, are responsible for advising and encouraging their subordinates to follow. In 2021, there was no report of any misuses of internal information.

3) Prohibition on trading of PTTEP's securities during the blackout periods, such as when material information is being disclosed, which may affect the securities price. All the Company directors, management holding position of Senior Vice Presidents (SVPs) and above, Vice Presidents (VPs) of the Finance and Accounting Group (FNA) as well as other management and employees having material internal information will be informed of such blackout period in order to abstain from trading of PTTEP's securities whether direct or indirect. This prohibition also applies to their spouses and minor children. Violation of this prohibition is considered a disciplinary offense.

PTTEP also requires all of the Company's directors, management holding positions of SVPs and above, VPs of FNA as well as their spouses and minor children to refrain from directly and indirectly trading securities of PTTEP at all times and to inform the Governance, Compliance, Internal Control, and Subsidiary Management Department two days in advance if necessary.

4) The Company directors, management holding positions of SVPs and above, and VPs of the Finance and Accounting Group must disclose complete information in regard to their securities possession as well as related trading activities to the Governance, Compliance, Internal Control, and Subsidiary Management Department in addition to the disclosing obligation to the SEC. These pieces of information will be disclosed to the Board on a monthly basis for CG&BE compliance monitoring purpose. Shareholdings by the Company directors, management holding position of Senior Vice Presidents (SVPs) and above, Vice Presidents (VPs) of the Finance and Accounting Group (FNA) is disclosed in the Company's annual report as required by the SEC.

(2) Employees

1) PTTEP complies with the UN principles by not employing illegal workforce and child labor in every area in which we operate. The following guidelines are described in the Company's CG&BE.

1.1) To understand and comply with all laws applicable to the PTTEP Group's operations in the locations where we conduct our business.

1.2) To understand the local customs, cultures, and traditions of the locality in which we operate.

1.3) To respect the local traditions, cultures, and cultural differences, and not to behave in any ways which contradicts them.

1.4) Not to discriminate against any individuals based on our personal relationship with that individual, his or her ethnicity, nationality, gender (including pregnancy, and sexual preference), age, religion, disability, personal views, or any other conditions or characteristics which are not concerned with work.

PTTEP strictly complies with labor laws enforced by each and every country we operate in. In Thailand, a Welfare Committee is established, comprising 8 employer representatives and 22 employee representatives from work sites which represented a combined 93% of total employees. Welfare Committee meets every 2 months to discuss labor-related issues that cover compensation, welfare, human resource management, and labor rights. In 2021, the Welfare Committee

convened 6 meetings where 15 issues were discussed covering compensation, welfare, benefits, and opportunities for career advancement. From 2022 onwards, PTTEP plans to include representatives from staff who are seconded to work in foreign countries to ensure that the Welfare Committee represented 100% of total employees.

2) PTTEP recruits, selects, and employs employees based on their qualifications, experience, and abilities to work in the target positions. According to the Good Corporate Governance and Business Ethics of the PTTEP Group, both internal and external candidates shall be fairly treated during our transparent recruitment process. Our employees are given an opportunity to develop and grow in their professional career as well as to join external activities under the Company's policy.

3) PTTEP sets up and regularly reviews compensation and benefits packages to ensure fairness to both the Company and the employees according to our short-term and long-term business performance, pay positioning among leading energy companies in Thailand and the region, types of work, required skills and expertise, difficulties of work, responsibility and accountability of each position, and the individual employees' performance results in order to attract and retain competent and capable employees.

4) PTTEP provides and regularly reviews welfare and benefits packages to ensure fairness to both the Company and the employees according to our ability to pay at the present and in the long run, focusing on the welfare and benefits which help to enhance the quality of life of the employees and their families. These are, for example, healthcare benefits for employees and their families which are comparable to those provided by other leading energy companies in Thailand and/or in the region. The Company regularly reviews welfare and benefits program to suit the changing social, economic, and other obligatory conditions of the business. In addition, the Company also provides psychological and legal consultation services through our "Sabaijaidee" program to the employees, their spouses, and children to help them guard against anxiety from their families, private life, and work concerns. The services are provided by psychologists and professionals from one of our consulting companies. The Sabaijaidee Live project has been organized on a monthly basis by inviting external speakers to provide professional knowledge, advice on mental health care and stress management. We also issue monthly articles about mental health care for employees. Psychology and stress tests have additionally been added to the WeConnect system so employees can assess their stress at any time on their own.

The Company establishes a provident fund program for our employees to ensure their financial security after resignation and retirement. The fund consists of contributions from both the Company and the employees. The Company makes a monthly contribution at a rate of 15 percent of our employees' basic monthly salary, while the employees contribute 2 to 15 percent of their basic monthly salary. Criteria and policy regarding this fund are subjected to the Company's regulations.

In addition, to celebrate and commemorate the long-term commitment and loyalty of our employees, PTTEP establishes the Long Service Awards Program to recognize staff who have reached significant milestone years of service, which are 5, 10, 15, 20, 25, 30, 35 and 40 years employment anniversary with the Company. The purpose of the program is to strengthen our corporate employee engagement through recognizing and honoring the commitment and dedication of long-term employees, while promoting careers aspiration within the Company as well.

5) PTTEP gives priority to human resources development to increase the organization's capability to drive the business performance as the Company always believes that human resources hold a key to our success. The Company provides opportunities for the employees to develop and enhance their knowledge, skills, and experience through both short-term and long-term training and development programs. Apart from professional capability and necessary skills building, the Company also

embeds the working values (*EP SPIRIT*) to all employees in domestic and international assets, so they can perform the expected behavior together based on the same corporate culture to attain the Company's vision and mission. In 2021, our employees attended training and development programs such as ISO 14001 Environment Awareness Course at an average of 48 hours per person per year. Details are disclosed in the "Management Structure" section under the "Human Resources Development Policy" topic.

6) PTTEP realizes the value and importance of regular consultation between the Company's employees and their supervisors to solve the problems incurred in the day-to-day operation as fast as possible and to maintain a good working relationship between them. Should any conflicts arise between the employees and their supervisors, the employees may file a complaint through one of the communication channels provided. The employees, including relevant witnesses, who comply with the provided measures and procedures and act in good faith shall be protected, without facing a penalty, termination, or any other negative consequences. Hence, PTTEP introduced various channels for Grievance Handling issues such as Whistleblowing System which, during this year, we have received a total of 18 cases and 8 of those are considered valid complaints by following Reporting and Whistleblowing Regulation and have been successfully executed. Another channel is through The Human Resources policy, which we have received 1 issue and we are also successfully resolved during this year. Moreover, we also included the result of each complaint case and related penalties (if any) in the annual report and sustainability report. Nonetheless, PTTEP also communicates lesson learned from each case to employees without disclosing personal information, this is to prevent recurrence. In this regard, PTTEP has certain process to verify facts confidentially. It is recognized only by those involved to protect the employees and the whistleblower will not be affected by the complaint.

7) PTTEP conducts the Employee Engagement Survey every 2 years, to seek the most effective policies and improvements in various work systems to be in line with the needs of employees. The Employee Engagement Survey has been planned to be conducted again in 2022.

The recent results in 2020 confirmed that staff engagement is continuously improving. In 2021, during on-going spread of the COVID-19 which had a potential of a rapid mass outbreak, PTTEP additionally organized activities to increase employee engagement through the Company's activities, both offline and online.

(3) Clients

PTTEP is committed to our mission to be a leading producer and supplier of crude oil, natural gas, condensate, naphtha, and LPG at fair and competitive prices. The Company sells the products under short-term to long-term contracts as well as in the spot markets. The Company assesses clients' suitability by the following four criteria, namely, economic return of the product prices, financial stability, safety standards, and compliance to local laws and regulations of each client. The Company treats all buyers equally for the optimal benefit of all and is also committed to strictly complying with the contracts and regularly coordinating with the buyers so that we can produce and deliver quality products as specified in the contracts on time and according to their demand.

(4) Governments

PTTEP conducts the business by adhering to the Good Corporate Governance and Business Ethics and dedicates itself to exploring and supplying petroleum domestically and internationally. The Company strictly complies with the laws applicable to our operations in all locations where we operate.

(5) Joint Venture Partners

Joint venture projects between PTTEP and the Company's domestic and foreign joint venture partners operate under mutual working agreements according to the international standards. These agreements include details in regard to the rights and duties of joint venture partners such as the right to become a member of a project's management committee. The committee is responsible for establishment of the guidelines on the procurement of products and services as well as for development of the strategic planning and annual budgeting with a clear scope and approach. The partners also have the right to audit annual financial and accounting records, also to set appropriate and clear measures, for example, penalty imposed on partners for failures to honor an agreement. The Company meanwhile remains focused on distribution of information to joint venture partners and external parties with transparency.

(6) Communities and Societies

PTTEP Corporate Social Responsibility Policy emphasizes on sustainable social development and stakeholder engagement at all levels. Social responsibility has been integrated with each business decision-making and execution process. This Corporate Social Responsibility Policy is adopted at all PTTEP operations areas.

In this regard, PTTEP uses the Issue and Stakeholder Management System (ISMS) as a tool to analyze social risks and mitigate impact as well as to promote good relationships with communities in every operating area. ISMS has been set as a KPI for the relevant managers and Public Affairs staff to ensure effective implementation. ISMS workshop is organized for the executives and staff of all domestic and international assets on a regular basis. Public Affairs staff revisit ISMS through ISMS Report Online System to update the information every year.

(7) Environment

With a commitment to operate business conscientiously and responsibly towards society and the environment by adhering to SSHE Policy which includes a commitment to environmental protection, the Company personnel, business partners, and contractors working for or on behalf of the Company must abide by the SSHE Policy.

PTTEP realizes that environmental impacts could be caused by PTTEP project's activities and affected stakeholders. The Company implements engagement process with relevant stakeholders to ensure their concerns and recommendations are addressed. These concerns and recommendations can be applied in mitigation and monitoring measures in environmental impact assessment report. Furthermore, PTTEP promotes a good relationship with communities by regular engagement and having assigned external relations staff to meet with local communities in case any environmental concerns or complaints are raised.

PTTEP transparently discloses environmental performance to the public in various channels. The disclosure is implemented in compliance with regulatory requirements, the Company's requirements, and international practices.

(8) Vendors

According to the Procurement Regulation and the Good Corporate Governance and Business Ethics of the PTTEP Group (CG&BE), vendors play a crucial part in the sustainability of our business. We therefore employ a policy which aims to treat our vendors as equal business partners. PTTEP's procurement system is based on fair competition, compliance with the laws and regulations as well as other legal obligations, and taking into account the Safety, Security, Health, and Environment (SSHE). The vendors must follow the Company's work safety standards. Their employees, meanwhile, are also required to have good business

ethics and respect for human rights. In addition, under the Company's vision, PTTEP leverages Energy Partner of Choice through competitive performance and innovation for long-term value creation.

PTTEP Vendor Guide

PTTEP developed the Vendor Guide to provide our vendors with the necessary information for contacting and conducting business with PTTEP. The information contained includes CG&BE, procurement process, contract management, and PTTEP Vendor Sustainable Code of Conduct and compliance, as well as several vendor communication channels for enquiries and complaints. Details of the PTTEP Vendor Guide are available on our website at www.pttep.com > E-Service > Procurement and Contract > PTTEP Vendor Guide.

Vendor Registration

PTTEP is deeply committed to free and fair business competition without trade barriers. There are 3 channels for interested vendors to register with the Company.

- 1) PTTEP website: Vendors can register their profiles through our website at www.pttep.com > E-Service > Procurement and Contract > Vendor Registration.
- 2) The Category & Vendor Management section: Vendors can contact the Category & Vendor Management officers or Procurement & Contract officers during business hours to register their profiles.
- 3) PTTEP Users: Vendors can directly register their profiles with PTTEP users who may, in turn, provide the vendors' names to the Category & Vendor Management section to preliminary review of their qualifications.

In 2021, PTTEP updated content in "PTTEP Vendor Sustainable Code of Conduct" to cover other important aspects, in which all vendors are required to acknowledge prior to vendor registration process. This is to ensure that the content complies with the new Trade Control on Weapons of Mass Destruction Related Items Act (TCWMD Act), biodiversity and ecosystem services and other aspects in alignment with the PTT group.

Additionally, PTTEP also published Privacy Notice and Guidelines on the Protection of Personal Data for the Procurement Process of the PTTEP Group on Procurement Website and Vendor e-Registration system to comply with the new Personal Data Protection Act.

New Vendor Pre-qualifications

PTTEP pre-qualifies suppliers by screening and evaluating vendors according to their product and service categories, independently, with equality and transparency, each function of the committee has the authority to consider and evaluate the vendors to ensure that they possess the qualifications to deliver the products or provide the services needed.

The evaluation process is performed by a special procurement committee and comprised three functional areas:

- 1) Technical and QA&QC
- 2) Safety, Security, Health and Environment (SSHE)
- 3) Commercial, Legal and Social

In 2021, PTTEP improved methodology to evaluate financial status of vendors for more robust and reduced risk. Additionally, the Company implemented new international standard database (Reuters World-Check) to carry out background checks concerning any wrongdoings related to bribery, corruption, and terrorism, etc. If the record shows any involvement in such practices and the vendor is not able to clarify the matter, the selection process will be terminated.

Vendor SSHE Contractor Management Procedure and Plan

PTTEP introduced new measures to monitor and improve the management of vendors regarding SSHE which is one of our core values. The SSHE Contractor Management Procedure and Plan were issued to ensure better understanding as well as to encourage appropriate operational planning.

Public Procurement and Supplies Administration Act, B.E. 2560 (2017)

As a state enterprise, PTTEP must comply with the Public Procurement and Supplies Administration Act, B.E. 2560. PTTEP has communicated to all vendors to be prepared for the new process should they wish to submit a supply proposal to PTTEP. The communication draws their attention to, for example, study the procurement process under the Act, register themselves on the e-Government Procurement (e-GP) system, be aware of the vendor registration requirement by the Comptroller General's Department and be aware of the anti-corruption policy and the requirement to put in place appropriate anti-corruption directions in relation to procurement. This is to ensure that our procurement procedure conforms to the objectives of the Act, namely value for money, transparency, efficiency and effectiveness, and verifiability. All information related to procurement process is also published on the Company's website for public notification.

Procurement Sourcing Strategy

PTTEP develops sourcing strategy based on scope of service, essential contract terms and conditions, vendors, market condition, estimated contract value, duration, Category Management Process as well as risk management in order to efficiently proceed with procurement plan.

In 2021, the Company focused on Strategic Sourcing in order to optimize the Company's total cost, e.g. bundle sourcing, sourcing new potential bidders for each work category, local content sourcing, specify appropriate scope of service or product specification. Additionally, PTTEP also conducted pre-bid meeting in order to clarify scope of service with all potential bidders for complicated and high-value projects prior to tendering process.

As for internal procurement sourcing approval process, the procurement strategy and contract, including a list of bidders must be internally approved by the three functions, namely, operations, assets, and procurement, in order to ensure checks and balances as well as verifiability. This information will then be submitted to the PC and joint venture partners (if any) for approval prior to proceeding with the bidding.

In addition, under the Production Sharing Contract (PSC), PTTEP is required to submit Annual Master Procurement Plan (AMPP) in order to obtain endorsement from the Department of Mineral Fuels (DMF) for procurement valued above THB 10 million prior to sourcing process. For any procurement transactions which have Contract Strategy, DMF's endorsement is required 30 days in advance of procurement process.

Vendor Selection

In the process of vendor selection for high-value and high-risk procurement, two sealed envelopes are required (one for a technical proposal, another for a price proposal). The technical envelope is opened first for technical and SSHE evaluation,

followed by the opening of the price envelope. Subsequently, the result of the bidding process will be submitted to the Procurement Committee (PC), joint venture partners (if any), and the Board (for high-value procurement) for endorsement prior to the stage of contract drafting with the selected vendor. Furthermore, PTTEP is required to inform bid result to DMF, and in the event that awarded contract value is 10% higher or lower than Procurement Strategy, DMF's endorsement is required prior to awarding the contract. The Company only selects vendors with the required technical and SSHE qualifications, and which offer the lowest price or on the basis of the best interest of the PTTEP Group.

Moreover, PTTEP has adopted a weighted technical and price score method together with Green Procurement criteria in the vendor selection process with a view to engaging qualified vendors at a competitive price through a process that is transparent and verifiable, and in order to align with the Company's sustainable development policy.

Contract Management and Assessment

Contract Management and Supplier Relationship Management (SRM) is an important component for the petroleum exploration and production business. A contract holder coordinates between vendors and all relevant parties, to ensure that they fully understand and comply with PTTEP's work plan, contract objectives, SSHE standards, and risk mitigation plan, as well as critical key performance indicators (KPIs). The contract holder also needs to assess and follows up periodically on the performance to ensure that the vendors operate according to the contractual terms. At the end of the contract, the contract holder also must complete the Contract Closed-out Report to identify areas of improvement regarding the operations and long-term sustainable relationship with the vendor.

Additionally, PTTEP enhanced contract management process to increase process efficiency by revising Procurement Regulation and Procurement and Contract Procedure and PTTEP Delegation of Authority & Signature (PTTEP DAS) to be more prudent, align with current process, and communicate the new procedure to all stakeholders via Contract Holder Certification Program workshop to build understanding and awareness.

Vendor Collaboration Initiatives

In 2021, PTTEP continued to develop an effective supply chain management and supported vendor collaboration initiatives to maintain a good relationship with the vendors, and develop Supplier Relationship Management Plan, e.g. organized special events to improve and initiate innovation for the services provided by drilling service vendors, held pre-bid meeting with vendors under critical work categories, held quarterly meeting with major vendors. As a result of good collaboration with vendors, PTTEP has successfully established 26 Master Service Agreements with vendors for the repetitive sourcing items to reduce procurement process and time.

In addition, PTTEP organized the "2021 PTTEP SSHE Forum" with the key objective of demonstrating PTTEP's strong commitment to continuously improving Safety, Health, and Environment in our operations. During the year, SSHE related activities, such as SSHE Contractor Online Workshop, Annual Contractor Audit, and S1 SSHE Club Monthly Meeting, were also held to build awareness and enhance efficiency in Safety, Security, Hygiene, and Environmental aspects to all stakeholders.

Local Content

To enhance the capability of domestic vendors to compete internationally, PTTEP supports sourcing of local products and services. Not only does it promote domestic employment and income distribution, but it also reduces the outflow of capital to other countries. As a result of our commitment to building a long-term relationship with the communities where we operate, the Company has been entrusted by the respective communities with licenses to operate. Meanwhile, the Company also encourages

our vendors to operate with care and responsibility wherever they are, and to increase their local sourcing to save on costs as well as to support the local communities.

Vendor Sustainability Management

PTTEP is committed to operating our business to achieve sustainable growth and adhering to good corporate governance for the community, society, and environment. To achieve these goals, we give priority to the supply chain management and the monitoring of our vendors.

"PTTEP Vendor Sustainable Code of Conduct" was drafted with its contents and scope adhering to the relevant rules, regulations, and laws. The vendors are encouraged, in all of their activities, to be ethical, respect human rights, comply with the SSHE standard, and prioritize environmental management. An example of PTTEP's environmental management plan is the "Green Procurement Roadmap" that we have collaborated with the "Thailand Environment Institute to develop Green Procurement Criteria" since 2017. The Company also encourages our vendors to apply the Vendor Sustainable Code of Conduct with their vendors to scale up the sustainable supply chain management.

Vendors' Environmental, Social, and Governance (ESG) Assessment

For more effective supply chain management in vendor management, in 2021 PTTEP and the PTT Group of companies conducted a Supplier On-site Audit via Microsoft Teams Meeting by External Party for two of our key suppliers in Maintenance and Logistics Services categories. Consistent with our policy and that of PTT Group of Companies, a workshop held by an external party was organized to promote better understanding among our vendors about the sustainability assessment criteria and to encourage improvement in the sustainability capability in their respective organizations.

Whistleblowing

To give confidence and protection to vendors and related parties from possible retaliation as a result of reporting in good faith of suspicious misconduct or wrongdoing of the directors, management, employees, or persons acting on behalf of the Company which might be in violation of the law, CG&BE, or other regulations of the PTTEP Group, the Company establishes the CG Hotline to handle the matters. Vendors can email the cghotline@pttep.com or report through "PTTEP Whistleblowing System" at www.pttep.com.

Additionally, PTTEP has also proposed one high-value sourcing project to Anti-Corruption Cooperation Committee to participate in Integrity Pact Project to verify transparency throughout the procurement process. In 2021, the project is under assessment process.

Digital Transformation in Vendor Management

PTTEP leverages digital technology in managing our vendors, to enhance the efficiency and effectiveness in managing risks. Various operations have been digitized under the Transformation strategy, covering the entire supply chain from the procurement process, contract management, purchasing, to goods and service delivery.

1) Developed new procurement platform (One procurement system) to replace legacy systems to digitalize end-to-end procurement process and have partially implemented the platform for Request for Quotation, Standard Form of Contract Repository, and e-Catalog. The remaining functions are expected to be completed by 2022.

2) Developed GEP Smart system to enhance Compliance Assessment and Methodology to comply with current procurement process and up to date.

In 2021, PTTEP focused on the system and process integration throughout the supply chain management by integrating supply chain and supplier data analysis with the external source of data into the Company's system. Additionally, PTTEP integrated annual procurement planning process, sourcing, logistics, and payment process to make the entire process agile and support electronic procurement process.

(9) Creditors

PTTEP recognizes the importance of the Company's internal and external stakeholders including creditors. This is based on our policy of equitable treatment for all stakeholders, and is an integral part of the CG&BE.

Emphasis is placed on accurate, complete, timely, and transparent information disclosure to all of the stakeholders. Information disclosed by the Company consists of financial and non-financial information. Financial information particularly the financial statements is reviewed and audited by an independent auditor in compliance with the Generally Accepted Accounting Principles (GAAP). The information is also endorsed by our Audit Committee as well as the Board of Directors prior to public disclosure.

Regarding creditors, PTTEP's debentures issuance and all relevant processes are in compliance with the laws, policies, and regulations stipulated by the SEC as well as the policies, purposes, and resolutions set forth at the Company's shareholders' meeting. The Company agrees to fulfill the obligations stated in the terms and conditions of the debenture and loan agreements and to ensure that the information is accurately and adequately disclosed to all stakeholders. The Company also maintains all of the necessary measures to remedy incidents or other types of impairments which may arise as a result of non-compliance.

(10) Competitors

PTTEP treats our competitors with professionalism, equality, and transparency. The Company, in our greatest effort, tries to avoid all unethical manners and ill-intentions to defame the reputation of our competitors through false, unfair statements, or acts. It is also committed to complying with local laws and regulations regarding trade competition. Details of the Trade Competition Policy are disclosed in the CG&BE.

(11) Customs and Traditions

PTTEP adheres to local customs and traditions. Orientation is provided, with inputs from leading consulting firms that provide insights into local life and customs, to the employees who received international assignments to help them understand and be able to act properly and appropriately. The Company also supports and encourages employees to learn the local language to strengthen the relationship of working together with the local people.

(12) Human Rights

PTTEP has a human rights policy where the Company is committed to respecting fundamental human rights by complying with all applicable legal requirements, cultures, customs, and values in dealing with all of our stakeholders, avoiding complicity in human rights abuses, and strictly prohibiting ourselves from direct and indirect employment of child and forced labor. The Company's Human Rights Policy fully complies with the UN Universal Declaration of Human Rights, and the UN Guiding Principles on Business and Human Rights and its corresponding covenants, including the international principles relating to labor practices and the United Nations Declaration on the Rights of Indigenous Peoples where applicable to the business. The Company also actively participates in the United Nations Global Compact (UNGC) while our UNGC Communication on Progress Report meets the criteria

required for the “Advanced Level” status for the 7th consecutive year. Additionally, PTTEP received the winning award for the state enterprise sector as the 2021 Role Model Organization on Human Rights from the Department of Rights and Liberties Protection, Ministry of Justice for the 3rd consecutive year.

Currently, PTTEP is a member, in fact, one of the founding members since 2016, of the Global Compact Network Thailand together with 14 other Thai organizations who have placed high priority on sustainable development. The objective of the network is to encourage Thai business sector to recognize the importance of conducting their business under the UN Global Compact principles.

The Company is also committed to providing fair employment, while ensuring that the employees have a safe and hygienic working environment, whether or not the country in which we invest has local laws on human rights. The Company ensures that no threats exist to employees or those related to the Company’s operations. Only ethical partners without any infringements of human rights are considered and be partnered with. The Company also provides the interaction between the executives and employees by allowing the latter to have their representatives in the welfare committee while exchanges of views and suggestions are encouraged for improvements of welfare and other benefits to improve our employees’ well-being.

For more details, please visit the PTTEP website, Sustainable Development topic, at

<https://www.pttep.com/en/Sustainabledevelopment.aspx>, subtopic: “Human Rights”

(13) Laws

PTTEP respects laws everywhere in which we operate. The Board sets the matters relating to the compliance with applicable laws, regulations, and policies in the Business Ethics of the PTTEP Group. The Company directors, management, and employees are required to understand as well as to strictly abide by all the applicable laws relating to the Company’s operations in all areas ensuring that all the PTTEP Group’s operations are in full compliance and efficient.

PTTEP has a centralized compliance unit namely, the Governance, Compliance, Internal Control, and Subsidiary Management Department to oversee and monitor compliance performance of the PTTEP Group. The Department has a direct reporting line to the Senior Vice President of the Corporate Secretary, the Executive Vice President of the Human Resources, Corporate Affairs, and Assurance Group, and the Chief Executive Officer, respectively. In 2013, the Company announced the Compliance Policy to express our commitment to full legal compliance as well as to define roles of all managers and employees in promoting compliance in all operations. The Compliance Program has been developed to enhance awareness of the importance of compliance among the employees. The Company also developed the Compliance Manual as a guidebook of reference in ensuring a consistent and effective approach to operating/working for all operations with regard to the applicable laws, the Company’s regulations, and contractual obligations with the purpose to enhance employee-awareness on both internal and external compliances.

In 2021, in order to ensure that PTTEP will comply with the new law which affected business operations, i.e. the Personal Data Protection Act, B.E. 2562 which will be fully enforced from June 1, 2022, onwards, PTTEP announced the Personal Data Protection Standard for Employees to inform employees how to treat the Personal Data in order to operate with full legal compliance; in addition, published the Personal Data Protection Notice for External Parties on PTTEP website to inform and make the external parties understand about the purposes and method of the collection, use, disclosure, and/or cross-border transfer of Personal Data, as well as the rights of the data subject.

6.1.3 Information Disclosure and Transparency

Disclosure of Financial and Non-Financial Information

Information disclosure is a key aspect of good corporate governance. PTTEP gives importance to the information disclosed to the Stock Exchange of Thailand (SET) as well as to the shareholders, and the information must be accurate, sufficient, timely, and equally available to all parties. The information is prepared according to the Company's Business Ethics Guidelines. The departments which are responsible for providing information and replying to external queries from the SET and public are the Investor Relations (IR) section and the Communications Department.

The information disclosure consists of financial information and non-financial information. Financial information is disclosed through financial statements which are reviewed and audited by the external auditor to confirm that they are presented accurately, in all material respects, according to the Thai Financial Reporting Standards. The financial statements are subsequently approved by the Audit Committee and the Board prior to being disclosed to the public. The Board reports their responsibilities with respect to the financial statements in the PTTEP Annual Report. In addition to the SET's requirements, the Company also releases unaudited annual financial statements in advance to allow timely access to the financial information for the shareholders and investors. Unless stated otherwise, the information before and after the audit usually and generally does not contain any significant changes. The Company also discloses non-financial information, such as acquisition and disposal of assets, related party transactions, dividend payments, the management discussion and analysis, risk management, invitation letter for the shareholders' meetings, minutes of meetings, as well as other information which is important for investment decisions according to the SET's and the Securities and Exchange Commission (SEC)'s requirements. The Company also disclosed the annual corporate governance report in the annual report and annual registration statement (Form 56-1).

Information that PTTEP discloses to SET, the Company's shareholders, investors, and the general public is disseminated in both Thai and English on the Company's website which also features other up-to-date information considered to be of interest to the aforementioned parties. Key information available on the website comprises petroleum exploration and production projects, investment projects, quarterly and annual analyst meeting presentations, webcasts, roadshow presentations, historical and latest stock performance, analyst coverage, and news releases. The Company also reports our safety, security, health and environment (SSHE) performance which is included in the annual Sustainability Report. In addition, the Company makes videos and infographics presenting the financial information and operating results available on its website for those interested.

The Company also publishes a quarterly investor newsletter, the Explorer's Journal, which includes information that may be beneficial to our shareholders and investors, such as quarterly performance highlights, project updates, good corporate governance practices, topics on sustainable development, and knowledge sharing on the fundamentals of the exploration and production business. The newsletter is bi-lingual, Thai and English, and is available in both hard copy and electronic formats. The latter can also be downloaded from the Company's website and/or received by electronic subscription. Moreover, the Company has launched PTTEP Investor Relations Mobile Application and Chatbot, effectively serving as an additional communication channel between the Company and shareholders for news and updates.

In 2021, PTTEP disclosed a total of 57 articles through the SET portal and organized the following activities for the shareholders and analysts.

Activities	Amount (Times)
• Virtual roadshows/conferences	24
• Analyst meetings	4
• Opportunity Day and SET Digital Roadshow (arranged by SET)	7
• Knowledge sharing events for investors	1
• Company visits and conference calls	10

Due to the COVID-19 situation, the activities in 2021 were mostly arranged in the forms of virtual conferences or online meetings and interacted with the investors through telephone correspondences. The IR team also sets up a booth at the Company's AGMs and readily provides information and answers to questions raised by the Company's shareholders.

The Company realized that disclosure of the information which is accurate, complete, timely, and transparent is a key to the CG&BE and therefore is committed to performing its best in this area.

Investor Relations

The Investor Relations (IR) section is responsible for the communication of relevant information and news which reflects PTTEP's fair value to analysts, shareholders, and general investors according to the SET's and SEC's requirements to foster confidence within the analysts and investment community. IR is also entrusted with upholding the corporate image and perception among analysts and investors, and advising IR related issues to the Company's executives.

PTTEP's IR can be contacted through the following channels.

1) Head of Investor Relations:

Thanat Thamrongsaksuvit Telephone: +66-2537-4259

2) Investor Relations section:

Telephone: +66-2537-7641, +66-2537-4217 and +66-2537-5522

E-mail: ir@pttep.com Fax: +66-2537-4444

6.2 Business Ethics

PTTEP is committed to operating ethically primarily because the Company's Business Ethics is regarded as the crucial behavioral framework and good business guidance for all directors, management, and employees to perform effectively, and ethically, as well as to treat every group of stakeholders equally, fairly, and transparently. These practices shall build confidence and acceptance on the efficiency and transparency of the Company's business operations, creating a long-term sustainable value for all stakeholders and fairness for everyone concerned.

Business Ethics of the PTTEP Group is part of the "Good Corporate Governance and Business Ethics of the PTTEP Group (CG&BE)". The Board first established its written Business Ethics in 1989, and it is constantly reviewed annually. The current version of the CG&BE was approved by the Board on February 14, 2021, and it was regarded as the highest regulation for business operations of the PTTEP Group. More details of the CG&BE are disclosed in Attachment 5.

PTTEP's Business Ethics consists of principles, guidelines for good practice, samples of questions and answers, information for further study, and a list of the departments responsible for each of the principles. There are 10 ethical issues which reflect our organizational values of the PTTEP Group to which directors, management, and employees must adhere as the following:

- 1) Compliance with Laws, Regulations and Rules, and Respect for Different Customs and Cultures
- 2) Political Neutrality
- 3) Human Resources
 - Workplace Environment
 - Privacy, Equal Treatment, and Anti-Harassment
 - Illegal Drugs, Substance Abuse, and Alcohol
 - Outside Employment and Executives' and Employees' Participation in Outside Activities
- 4) Use and Protection of Information and Assets
 - Record Keeping, Use, Disclosure and Safeguarding of Information
 - Use and Storage of Electronic Data and Information Technology Resources
 - Utilization and Protection of Intellectual Property
 - Insider Trading and Use of Inside Information
- 5) Conflicts of Interest
- 6) Procurement and Contracts
- 7) Anti-Corruption
- 8) Trade Competition
- 9) Anti-Money Laundering
- 10) Safety, Security, Health, and Environment

PTTEP has distributed its PTTEP Group's CG&BE booklets to all directors, management, and employees for their reference and adherence. Everyone is also required to sign their names, thus committing themselves to apply the PTTEP Group's CG&BE to the highest working standards. In addition, the booklets are sent to the Company's business partners, regulators, parties with regular business relationships with the Company, and other interested parties. For the convenience of the Company's shareholders, investors, and interested parties, the contents of the PTTEP Group's CG&BE booklets can also be found at the Company's website under the Corporate Governance section.

PTTEP continuously enhances and promotes the awareness and understanding of the PTTEP Group's CG&BE among the Company directors and personnel. The Board governs the ways in which the CG&BE is communicated to the directors and personnel to ensure that they are able to uphold and comply with such policy accordingly. Communications also extend to external parties, for example, vendors, joint-venture companies, and agents of the PTTEP Group in order to promote good ethical cultures throughout the business chain and society in general. Details are explained in the "Continuing to Provide Communication, Knowledge and Training" sub-topic under the "Anti-Corruption" topic.

The Board monitors and evaluates the performance of the CG&BE activities quarterly. The Corporate Secretary Division is in charge of reporting them to the Corporate Governance and Sustainable Development Committee and the Board on a quarterly basis to ensure that CG&BE activities achieve the targeted performance. Furthermore, the Corporate Governance and Sustainable Development Committee has reviewed the work plan by taking into account the evaluation results on CG&BE and anti-corruption measures to ensure continuity and efficiency for the development of the work plan.

6.3 Major Changes and Developments of Policy, Practices, and Corporate Governance System in the Past Year

6.3.1 Significant Changes and Developments of the Corporate Governance Policy, Guideline, and Governance System

PTTEP realizes the importance of good corporate governance that it will promote effectiveness and sustainable growth of the Company's operations leading to the best interest of all stakeholders. PTTEP, therefore, regularly reviews and improves the policy, regulation, and relevant guidelines to ensure the effectiveness of implementation. The significant changes and developments of the Company in 2021 are as follows:

1) The Revision of the Good Corporate Governance and Business Ethics Regulation (CG&BE)

The CG&BE regulation is regularly reviewed and updated every year to ensure continued relevance in changing laws and alignment with international standard. For the result of 2021's review, the content in the regulation is still in line with the corporate governance principle for listed companies and current good corporate governance practice and there is no significant change in this year.

2) The Stakeholder Perception Survey

In 2021, PTTEP conducted the Stakeholder Perception Survey, which was conducted by an external independent consultant, gathered information from internal and external key stakeholders toward the Company's sustainability framework (HPO, GRC, and SVC) and GRC Role Model. The results of the survey are used to develop the Company's improvement plan to ensure the effectiveness of the Company's operations and to align with good corporate governance principles. This will establish confidence as well as conscious care for all the Company's stakeholders and drive the Company to achieve corporate goals in a sustainable manner.

3) The Electronics CG&BE Report System

The electronic CG&BE Report System was developed and completed in 2021, to improve the effectiveness of the previous reporting in document format. This system is used for reporting and collecting the employees' information related to the CG&BE regulation including the CG&BE Commitment Form, the Conflicts of Interest Disclosure, and report the information of persons having close relations and working within the PTTEP Group and the company in which PTTEP has invested to order to prevent potential conflicts of interest which may arise.

6.3.2 Other Good Corporate Governance Practices

PTTEP values and strictly abides by the PTTEP Group CG&BE and international best practices, which are applied with due regard for our circumstances, business, and the best interests of the Company, shareholders, and stakeholders as a whole. Below is PTTEP's additional implementation pursuant to best practices:

1) Since PTT holds (both directly and indirectly) 65.29% shares in PTTEP, the free-float proportion of shares is less than 40% of the total paid-up shares. Yet, the current free-float proportion is enough for minor shareholders to exercise their rights to veto significant transactions. PTTEP values full compliance with the SEC and SET rules and regulations while taking seriously the perennial stewardship of minor shareholders' rights. Our assorted activities are regularly organized to convey useful data and information to these shareholders, winning acceptance from relevant external agencies.

2) PTTEP recognizes the importance of advanced delivery of the Shareholders' meeting notices to shareholders to allow them enough time to duly examine the data. The shareholders' meeting date is scheduled in March-the beginning of April every year for shareholders' convenience and to not coincide with other listed companies. This schedule also provides shareholders with early receipt of rights and benefits, including dividends. As PTTEP operates its businesses in many countries, it takes more time to carefully audit our financial statements, which are in the interests of shareholders, and to plan various report preparation well. Recently, the Company was able to send meeting invitations to shareholders by post 21 days in advance before the Meeting. In addition, PTTEP also publicized the meeting invitations on our website no less than 30 days in advance before the Meeting to give shareholders enough time to examine the meeting data.

3) Under PTTEP's Articles of Association, director election is done by a majority vote, with one share carrying one vote, and shareholders can vote for individual directors. Directors receiving the highest votes are elected along with those receiving ranked votes, and so on until the number of available director positions are filled. PTTEP, therefore, does not rely on the cumulative voting method. PTTEP has defined other methods of looking after the interests of minority shareholders, including allowing them to nominate director candidates for election in advance.

4) Detailed and thorough verification of the rights of attending shareholders ensures that multiple proxies are properly done without affecting the rights of other attending shareholders.

5) Directors automatically retire at the age of 70; their qualifications become void when they reach this age.

6) PTTEP specifies a maximum of 9 years for consecutive service by directors and independent directors. Those who completed consecutive terms totaling 9 years are no longer eligible for director re-election. PTTEP also considers and values the possibility of shortening consecutive periods for independent directors, such as not more than 6 years, when the time is right; the primary consideration is for suitably qualified directors for the exploration and production business in the best interests of PTTEP and its stakeholders.

7) PTTEP requires that the number of independent directors should be no less than half of the Board of Directors.

8) PTTEP values the independence of the Chairman of the Board; therefore, we give a top priority to choose the Chairman from the list of independent directors, except for other justification or suitability in other aspects, e.g. business expertise, work experience, and good leadership in order to find the suitable person. PTTEP has adopted specific processes for this position, including Chairman assessment by the entire Board of Directors to ensure his genuine independence. Details appear under the "Independence of the Chairman" topic. The present Chairman is an independent director.

9) The PTTEP Board of Directors annually revisits the suitability of the Skill Mix by explicitly defining each skill aspect or proficiency and setting the annual target for the Skill Mix in line with prevailing business circumstances and changing of business environment for director recruitment and capability development. The Board also values the Board's diversity by not discriminating against gender, nationality, ethnic group, race, country of origin, or cultural background.

10) PTTEP applies best practices on requiring a minimum quorum for the meeting voting of no less than two-thirds of the entire Board's directors (excluding those with vested interests). Furthermore, PTTEP's corporate governance requires that directors absent without good reasons from the Board meetings on more than three consecutive occasions should automatically lose qualifications as the director. PTTEP also sets meeting attendance as an indicator of the Board Performance Target. PTTEP's practice is to determine and schedule Board and sub-committee meetings during the Year in advance for the benefit of efficient planning by the directors. In 2021, more than two-thirds of the Board attended every Board meeting. Finally, before any voting, the Chairman gives all directors opportunities to ask questions and extensively discuss issues for a unanimous decision.

11) Assessment of the Board of Directors and sub-committees is done through scoring on performance assessment forms for both self-assessment and cross-assessment, Chairman assessment, and entire-Board assessment together with evaluation against Board performance target covering all aspects of both business performance and good corporate governance. Assessment results are discussed by applicable sub-committees in order to improve their performances. In addition, the Board of Directors undergoes appraisal by neutral external agencies, including the Corporate Governance Report of Thai Listed Companies (CGR) Project carried out by the Thai Institute of Directors (IOD), and the ASEAN CG Scorecard assessment. Survey findings are used for the Board's performance improvement.

12) This year PTTEP held 4 independent directors' meetings and 1 non-executive meeting for consultation and exchange of views on crucial, useful matters of the Company, and major and minority shareholders and upgraded our corporate governance practices. The CEO was subsequently informed of the outcomes of these meetings.

13) PTTEP specifies a policy on CEO and senior management compensation in line with their short-term and long-term performance, as well as tied to PTTEP's performance. The Company disclosed the ratio of the CEO's compensation to the average compensation of the Company's executives, as well as to the average of all employees.

14) PTTEP does not have a scheme to give the management the right to buy PTTEP shares, but the Company instead applies an appropriate compensation structure suitable for business, which is competitive and screened by the Nominating and Remuneration Committee and the Board of Directors.

6.3.3 Awards and Recognitions for Good Corporate Governance

1) Being a recipient of the NACC Integrity Awards granted by the National Anti-Corruption Commission (NACC) at the 10th NACC Integrity Awards, the Company was deeply honored to have received this prestigious award for the 4th time. This Integrity Award is given to organizations that stand out as a role model in operating its businesses with integrity, transparency, fraud prevention, and social responsibility which is in line with good corporate governance principles and international ethical practices.

2) Being awarded the 2021 Role Model Organization on Human Rights in State Enterprise sector by the Department of Rights and Liberties Protection, Ministry of Justice, PTTEP was honored to have won this prestigious award the 3rd consecutive year. This recognition is a testament of our operation strictly adhered to principles of good corporate governance, corporate social responsibility, respecting diversity, and fundamental human rights in all operating areas. The Company has passed the evaluation criteria which are in line with the United Nations Guiding Principles on Business and Human Rights (UNGPs) and established guidelines for preventing human rights violations, built awareness and responsibility for human rights among personnel. PTTEP also has systems in place to oversee every function within the Company and whistleblowing channels for stakeholders to voice their grievances.

3) Being certified by Thai Private Sector Collective Action Against Corruption (CAC) as a member for the 3rd consecutive term, reflects PTTEP's commitment and compliance to anti-corruption policy and adherence to principles of good corporate governance and business ethics.

4) Being rated "Excellent" and receiving five of the National Corporate Governance Committee's symbols, the highest level, based on the Corporate Governance Report of Thai Listed Companies (CGR) 2021 of the Thai Institute of Directors Association (IOD). PTTEP has continuously been rated and placed at this highest level since the first assessment in 2001.

5) Being selected to receive 2 awards at the 16th ASIAN ESG Award 2021 from Corporate Governance Asia Magazine. The awards are as follows: (1) Asia's Icon on Corporate Governance Award for the 9th consecutive year, (2) Asian Corporate Director Recognition Award for Mr. Phongsthorn Thavisin, Chief Executive Officer (CEO), in recognition of his contributions in enhancing good corporate governance. Moreover, being recognized as "ESG Influencer" for the 2nd time as an organization who plays key role in driving ESG.

6) Being recognized as an exemplary corporation in organizing the Annual General Meeting of Shareholders (AGM) for the year 2021 by successfully scoring 100 percent for the 10th year in the AGM checklist assessment conducted by the Thai Investors Association.

7) Being a recipient of 5 awards from the Asset Magazine of Hong Kong. The awards are as follows: (1) The Asset Platinum Award for the company with strong commitment to Environmental, Social and Governance (ESG) in its operations, (2) The Asset Best Initiative in Innovation for the product or service advancements or digital enhancements that embrace new ways of doing business, (3) The Best Initiative in Social Responsibility for social responsibility projects aimed at developing a positive relationship with the society in which they operate, including its stakeholders, (4) The Asset Best Investor Relations Team Award for the contribution of an IR team in terms of their cooperation with analyst and investor effectively and initiatives they have taken in newer arenas such as social media and web-delivered services, (5) The Asset Best CEO Award for the leadership qualities of a chief executive officer and rewards a range of skills and attributes including inspirational leadership, strategic thinking, team and relationship-building, effective communication and change management.

8) Being selected as a member of the 2021 Dow Jones Sustainability Indices (DJSI) in the DJSI World Oil and Gas Upstream & Integrated Industry for the 8th consecutive year and received Best-in-class in various criteria was an honor. These achievements reflect PTTEP and all employees' commitment to sustainable practices with adherence to a Sustainable Development Framework. Dow Jones Sustainability Indices (DJSI) are a family of internationally recognized indices that evaluate the sustainability performance of the largest 7,000 companies in the S&P Global Broad Market Index. To be selected for inclusion in the DJSI, companies would be evaluated on various economic, environmental, and social criteria. The indices serve as a primary benchmark for investors who integrate sustainability considerations into their investment portfolios.

9) Being selected as a constituent member of the FTSE4Good Index Series for the 6th consecutive year by FTSE Russell who prepared such index and endorsed that PTTEP has satisfied the requirements to become a constituent of the FTSE4Good Index Series. The FTSE4Good Index Series is designed to identify companies that demonstrate strong Environmental, Social and Governance (ESG) practices measured against international standards. The FTSE4Good indices are used by a wide variety of market participants to create and assess responsible investment funds and other products.

10) Being awarded 2 SET Awards 2021 which are Best Sustainability Awards in the category of Sustainability Excellence for the 2nd consecutive year and Best Investor Relations Awards among listed companies whose market capitalization values exceed THB 100 billion. PTTEP was also honored to be listed in Thailand Sustainability Investment (THSI) for the 6th time. The awards were presented by the Stock Exchange of Thailand (SET) and Money & Banking Magazine. The SET Awards aims to recognize and present the awards to listed companies with outstanding performance while embracing ESG (Environmental, Social and Governance) in their operation.

11) Being selected to receive the winning award of 16th Golden Peacock Global Award in recognition of its Corporate Social Responsibility (CSR) for the 2nd consecutive year. The virtual awards ceremony was organized by The Institute of Directors (IOD), India. This award is given to organizations that commit to conduct their businesses with good corporate governance principle and drive economic development as well as improve the quality of life for local community and society.

12) Being selected to receive 2 CSR awards from the 2021 Asia-Pacific Stevie Awards, United States of America, for the 6th consecutive year. PTTEP received Silver Award in the category of Innovation in Community Relations or Public Service Communications for the Forest Restoration Project for Eco-Learning at Sri Nakhon Khuean Khan Park Project (Khung Bang Kachao). The project is implemented in collaboration with the Office of Royal Projects, the Department of Forestry, and Kasetsart University to restore the forest for ecological learning by creating Nature Classroom for all, improve landscape and facility, create nature trails including the wheelchair accessible trail, provide the outdoor exhibition, and build conservation awareness to youth in local community. Bronze Award was for the Stunting Prevention Program in Indonesia.

13) Being selected to receive the CSR award in Health Promotion category from the Asia Responsible Enterprise Awards (AREA) 2021 for its health development projects including Community Nurses Project, Lan Krabue Hospital, and Songkhla Hospital Capacity Development Project and Mobile Healthcare Project. The Company has also continually provided medical equipment and supplies to hospitals for the fight against COVID-19. In addition, PTTEP received a Carbon Champion Certificate to strengthen the Company's commitment to reduce environmental impacts through the PTTEP Reforestation Project, covering an area of 105,000 rai in 27 provinces across Thailand.

14) Being selected to receive Silver Award for H.T.M.S. Underwater Learning Site Project from the Gulf Sustainability Awards 2021 in the category of Best Community Development. This project aims to protect natural coral reefs by transforming former battleships to be artificial coral reefs and underwater tourist attractions since 2011. The project is a collaborative effort among various agencies and the local communities. The man-made dive sites are built to be a new home for corals and marine animals as well as to reduce impacts on the natural coral reefs that are recovering from coral bleaching. They have been considered as one of the popular dive sites to study marine biodiversity as well as helps promoting tourism and generating income for local communities.

15) Being selected to receive Communitas Award 2021 from the USA as an enterprise with Excellence in Corporate Social Responsibility. The award was granted under the Ethical and Environmental Responsibility category for Crab Hatchery Learning Center Project. This project aims to restore marine resources and promote sustainable income generation for local fisheries in Songkhla province. PTTEP is the only company in Thailand and one of four companies in Asia to have won the award this year. Crab Hatchery Learning Center Project is a collaborative effort among PTTEP, government agencies, and local communities since 2013. Currently, there are 5 centers in the provinces of Songkhla, Pattani, and Nakhon Si Thammarat. In addition, the project will be expanded efforts to Aquatic Animal Hatchery Learning Center Project. The goal is to establish more learning centers, covering all 17 provinces around the Gulf of Thailand in 2025.

16) Being selected to receive 3 global CSR excellence awards from the 12th Asia Best CSR Practices Awards 2021. “The Forest Restoration for Eco-learning” project at Sri Nakhon Khuean Khan Park in Samut Prakan was awarded in the category of Best Environment Friendly project. “Waste to Energy” project was awarded in the category of Community Development. Lastly, “Community Health Development” and “Fighting COVID-19” projects were awarded in the Concern for Health category. These awards reflected PTTEP’s efforts in supporting community and society.

17) Being selected to receive 3 gold awards for the company with market capital higher than USD 1,000 million from the 13th Annual Global CSR Virtual Summit and Awards 2021, Singapore. The first award is in the category of CSR Leadership for the overall CSR performance excellence. The second is in the category of Best Community Programme for the Community Health Development programs and the last one is in the category of Best Environmental Excellence for Sea Turtle Conservation Project.

18) Being selected to receive the Best CEO Award, presented to Mr. Phongsthorn Thavisin, Chief Executive Officer, PTTEP, in the resources category at IAA Awards for Listed Companies 2020. The award ceremony was organized by the Investment Analysts Association and the Stock Exchange of Thailand. The IAA Awards are presented to executives of listed companies nominated and voted by analysts and fund managers. The criteria are based on management excellence, industry knowledge, and good corporate governance. These key factors will drive business success and assure sustainable growth, aiding the development of Thai capital market as well as economy.

19) Being granted to receive 5 awards at the 11th Asian Excellence Awards 2021 namely Asia’s Best CEO (for the 4th consecutive year), Asia’s Best CFO (for the 8th consecutive year), Best Investor Relations Company (Thailand) (for the 9th consecutive year), Asia’s Best CSR (for the 2nd consecutive year) and Best Investor Relations Professional. The event was held by Corporate Governance Asia Magazine which is a financial magazine that promotes corporate governance in Hong Kong and Asia. The awards reflect the achievement of PTTEP in terms of excellence in organization management, financial management, IR personnel, and Social Responsibility activities.

20) Being selected to receive 5 awards in human resources management. Received 3 awards in the category of Best Employer Brand for the 2nd consecutive year, CEO of the Year, and Award for Excellence in Training from Thailand Best Employer Brand Awards 2021. The virtual awards ceremony was organized by World HRD Congress, CHRO Asia, and Employer Branding Institute to honor Thai organizations for their achievements in human resources management. Additionally, PTTEP received 2 awards from Thailand HR Excellence Awards 2021: Gold Level in Excellence in Talent Acquisition Award and Bronze Level in Excellence in Workplace Culture. The awards presentation was organized by Human Resources Online, Singapore. HR Excellence Awards aims to honor distinguished organizations in Thailand, with excellent human resources management in international standard. The awards reflect that PTTEP continues to strive for human resources development and sustainable value creation for all stakeholders, according to its vision, Energy Partner of Choice. Moreover, during the COVID-19 pandemic, the Company has transformed internal working process to fit the New Normal of work by introducing digital technology into working system and virtual learning.

21) Being selected to receive Best Practice Award in Excellence Level from the initiation of New Way of Working Project with objectives to improve PTTEP work pattern to be in line with new normal way of working, work-life integration, ensure employees' good health and workplace environment including to support office facility and expenditure management. PTTEP joined the 7th International Best Practice Competition. The award ceremony was organized by the Centre for Organisational Excellence Research (COER), New Zealand. This award encourages participating organizations to share best practices and learn from experience of others to improve their practices.

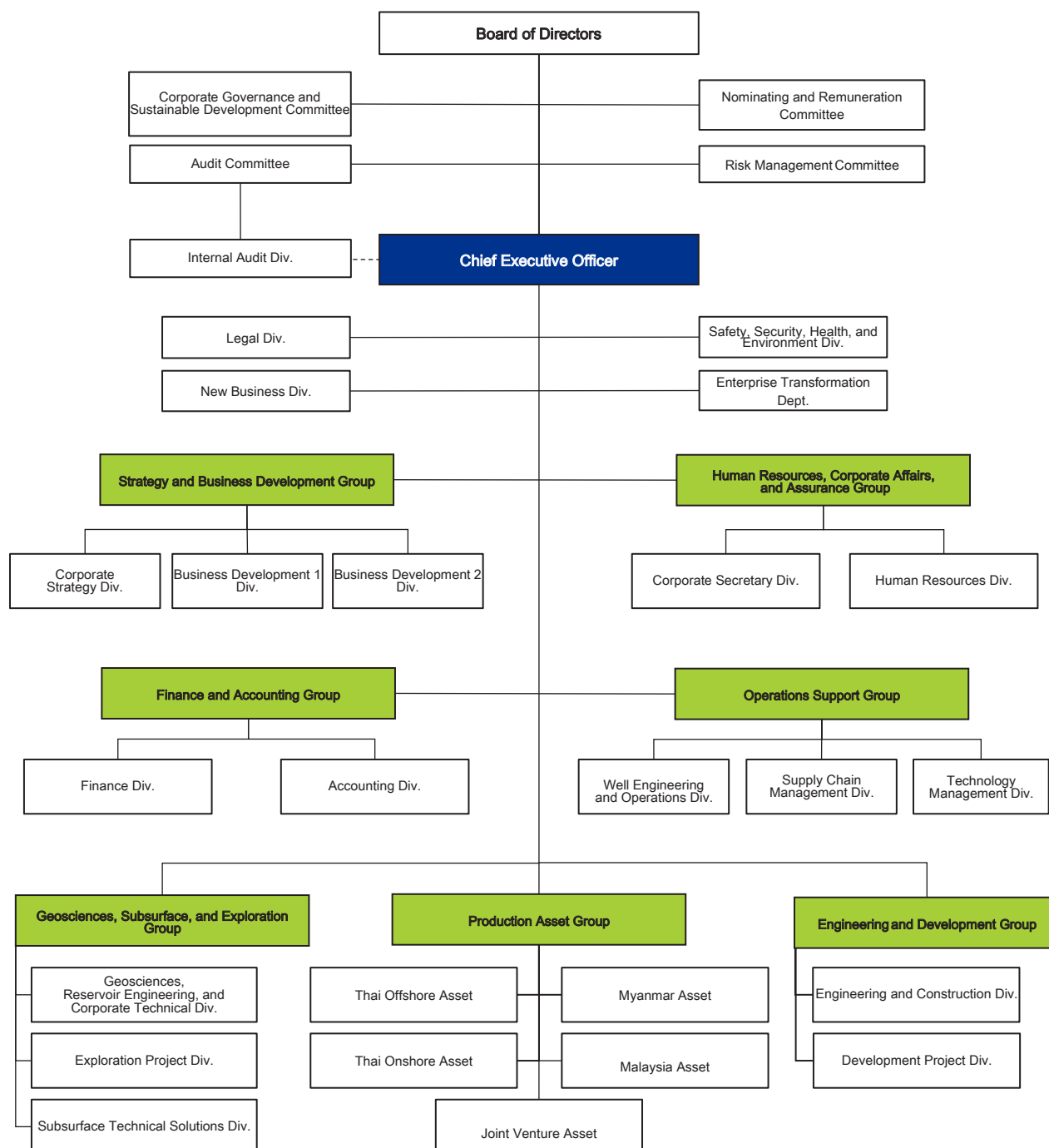
22) Being selected to receive National Innovation Awards 2021 for Social and Environment Contribution. PTTEP's Cartier Project which involves conversion of excess gas from petroleum production into high-value Carbon Nanotubes was awarded the second runner-up in the private sector category. Cartier Project aims to reduce greenhouse gas emission. The research project is conducted by PTTEP in collaboration with PTT Innovation Institute, National Science and Technology Development Agency (NSTDA), and Chulalongkorn University.

23) Being selected to receive the Global Most Innovative Knowledge Enterprise Award 2021 (Global MIKE Award) and Gold-level Thailand Most Innovative Knowledge Enterprise Award 2021 (MIKE Award) from Global and Thailand MIKE Award Judging Committee 2021. The award recognizes PTTEP's world-class innovation and knowledge management excellence. PTTEP continuously promotes innovation and knowledge management both within the Company and through partnerships. The Company embraces innovation culture as an integral part of day-to-day operation and towards sustainable growth.

7. Governance Structure and Key Data on the Board of Directors, Specific Committees, Management, Employees, and Others

7.1 Governance Structure

As of January 1, 2022



7.2 The Board of Directors

7.2.1 Composition of the Board

PTTEP's Board of Directors (Board) consists of qualified directors who are versatile and are of possession of expertise relevant to the Company's line of work. In 2021, PTTEP reviewed the Board's Skill Mix to reflect the Company's strategic direction by classifying it into 12 subject areas under two categories as follows:

1) Core Skills: basic expertise which is necessary for directors to govern the Company, namely Business Judgment, Management Skills & Corporate Governance, and Business Strategy.

2) Specific Skills: specific expertise or experience which is useful for directors to supervise and govern the Company, namely Industry Knowledge, Accounting, Legal, International Market and Collaborations, Risk & Crisis Management, Economics & Finance, SSHE (Safety, Security, Health and Environment), Technology and Organization Change & Development.

Directors must not be over 70 years old and shall possess the qualifications according to the Good Corporate Governance and Business Ethics of PTTEP Group (CG&BE), Public Limited Companies Act, and Securities and Exchange Act as well as rules and regulations of the Securities Exchange Commission (SEC), the Capital Market Supervisory Board (CMSB), the Stock Exchange of Thailand (SET), and relevant resolutions of the Cabinet. Directors shall also commit and dedicate their time to fully perform their duties and responsibilities. Directors, for example, would be regarded as unqualified if they failed to attend Board meetings more than three consecutive times without any reasonable justifications.

The Board structure consists of 15 directors, considered to be appropriate for the Company's operational size. The Board consists of non-executive and executive directors. In addition, the Board shall have independent directors, comprising a number not less than half of the incumbent members. As of December 31, 2021, the Board consisted of 15 directors including:

- 14 non-executive directors (93.33% of total members)
- 1 executive director: the Chief Executive Officer (CEO)
- 10 independent directors (66.66% of total members), a ratio which is not less than half of the incumbent members as required by the Company's CG&BE, and more than the number required by law
- 2 female directors

PTT is the only major shareholder of PTTEP, while the minor shareholders are highly varied. The afore-mentioned Board's component and proportion are therefore considered appropriate to maintain the balance within the Board for the best interests of the Company's shareholders.

The names, biographies, qualifications, experiences, and numbers of shares of the non-executive directors, executive directors, independent directors, and directors from PTT are disclosed under the "Information of the Board of Directors, Management, Controlling Persons and Company Secretary" section as well as in PTTEP's annual report and website.

7.2.2 The Current Board of Directors

The name list of the Board of Directors as of December 31, 2021, are as follows:

Name of Directors		Position	Starting Date
1.	Mr. Krairit Euchukanonchai	Chairman and Chairman of the Independent Directors Committee	February 1, 2021
2.	Mr. Achaporn Charuchinda	Independent Director, Chairman of the Audit Committee, and Member of the Nominating and Remuneration Committee	January 1, 2013
3.	Admiral Tanarat Ubol	Vice Chairman of the Independent Directors Committee, Chairman of the Corporate Governance and Sustainable Development, and Member of the Nominating and Remuneration Committee	September 1, 2014
4.	Lieutenant General Nimit Suwannarat	Independent Director, Member of the Risk Management Committee, Member of the Nominating and Remuneration Committee	September 1, 2014
5.	Mr. Pitipan Teparitnargorn	Independent Director, Member of the Risk Management Committee, Member of the Corporate Governance and Sustainable Development and, Member of the Nominating and Remuneration Committee	November 1, 2015
6.	Mr. Bundhit Eua-arporn	Independent Director, Chairman of the Nominating and Remuneration Committee	August 1, 2017
7.	Ms. Penchun Jarikasem	Independent Director, Chairman of the Risk Management Committee, and Member of the Audit Committee	February 1, 2018
8.	Mr. Patchara Anuntasilpa	Director and Member of the Nominating and Remuneration Committee	November 1, 2018
9.	Mr. Dechapiwat Na Songkhla	Independent Director and Member of the Audit Committee	January 16, 2019
10.	Mr. Atikom Terbsiri	Director and Member of the Risk Management Committee	October 1, 2019
11.	Mrs. Angkarat Priebjivat	Independent Director, Member of the Audit Committee, and Member of the Corporate Governance and Sustainable Development Committee	October 1, 2019
12.	Mr. Auttapol Rerkpiboon	Director	August 1, 2020
13.	Mr. Veerathai Santiprabhob	Independent Director, Member of the Risk Management Committee, and Member of the Corporate Governance and Sustainable Development Committee	October 15, 2020
14.	Mr. Wattanapong Kurovat	Director and Member of the Risk Management Committee	May 1, 2021
15.	Mr. Montri Rawanchaikul	Director and Chief Executive Officer	October 1, 2021

7.2.3 Authorities and Responsibilities of the Board

Roles and Responsibilities of the Board

According to the principles of accountability, duty of care, and duty of loyalty, the Board has been clearly defined their roles and responsibilities, and required to perform them strictly in line with those stipulated by laws, objectives, Articles of Association of PTTEP, and resolutions of the shareholders' and Board meetings. The scopes of the authority and responsibilities of the Board are as follows:

- 1) To govern PTTEP's operations in compliance with the Company's CG&BE as well as to be a leader and role model in adopting, advising, communicating, and promoting the CG&BE among the employees and other organizations.
- 2) To consider and approve the statement of vision, mission, and corporate values of the PTTEP Group to ensure that they are effectively applicable and practical.
- 3) To consider and approve the PTTEP Group's strategic plan, business direction, targets, workforce structure, and other significant operations, including regularly monitoring and reviewing operation results, to ensure that they are in line with the Company's strategy, operational direction, targets, and policies as planned with an emphasis on mobility and applicability to allow the management to effectively and efficiently manage the business, whilst considering the impacts on safety, security, health, environment, innovation and technology, as well as responsibility to society.
- 4) To establish efficient and adequate internal control systems through a clear set of regulations and work processes as well as having a standardized and reliable accounting system and financial reporting, appropriate and adequate risk management, effective compliance program, and monitoring system.
- 5) To consider and approve significant matters as prescribed by laws or in the Company's affidavits, policies, or regulations, as well as matters that may result in corporate obligations.
- 6) To consider the cases which are related to conflicts of interest in a prudent and transparent manner and to review work processes to ensure appropriate checks and balances for efficient internal control. In such case, reports of vested interests of oneself and/or those of related parties must be filed, including potential misuse of the Company's properties and execution of transactions with the Company's connected persons in an inappropriate way.
- 7) To ensure that the Company has clear and proper regulations, standardized and reliable financial reporting, efficient internal control system, and proper risk management.
- 8) To ensure that audits are performed effectively by internal and external auditors.
- 9) To ensure that communication and disclosure of information to the Company's stakeholders are performed in an accurate, complete, appropriate, and timely manner.
- 10) To ensure that the Company's stakeholders are treated fairly and equitably.
- 11) To consider, approve, and appoint specialists from different professional fields to provide the Company with insightful information as well as to act on the Company's behalf on matters which can significantly affect the financial position and reputation of the PTTEP Group.
- 12) To consider and approve the Board Performance Target as well as to evaluate performance of the Board, Chairman of the Board, and sub-committees.

13) To consider and approve the Performance Agreement of the Chief Executive Officer (CEO), as well as to evaluate performance and determine his or her remuneration. The Board is also responsible for ensuring that the Company has an effective performance evaluation process for executives.

14) To consider and delegate appropriate authority to the CEO to manage the Company's operations according to the strategic plan, business direction, targets, and policies of the organization, as well as to ensure that there is appropriate oversight and efficient monitoring and evaluation.

The Board is permitted to request information and seek advice and services in regard to the Company's business operation from the management. In addition, if deemed necessary and appropriate, directors may seek advice from external and independent advisors at the Company's expense.

Responsibilities of the Board

The following are the major responsibilities of the Board. Details are disclosed in the "Management Structure" section under the "Duties and Responsibilities of the Board" topic.

1) Policy-Making and Operational Direction

The Board is responsible for making decisions in regard to the PTTEP's operational policies and determination of the corporate vision, mission, and values. The Board is also assigned to be directly involved in the Company's budgetary and planning, and organizational development strategy to accommodate continuous changes in the business environment, as well as to provide the management with pieces of advice to lead the Company towards our five ultimate goals, being "Growth, Prosperity, Stability, Sustainability, and Dignity".

2) Good Corporate Governance and Business Ethics

The Board is responsible for the establishment of the PTTEP Group's CG&BE for all of the directors, management, and employees to adhere to, while operating businesses for the PTTEP Group. This is to ensure that our businesses are operated under good standards and ethical practices with transparency and efficiency. In addition, the rights of the Company's stakeholders are preserved proportionately to their fair share to maintain the general confidence and acceptance in the Company. The Corporate Governance Unit meanwhile has been established to be responsible for matters regarding the CG&BE.

3) Internal Control and Auditing

The Board is responsible for assuring that the PTTEP Group is equipped with an effective internal control system which is comparable to the acceptable risk levels. The Audit Committee and the Internal Audit Division are assigned to periodically and regularly review and monitor the internal controls as well as to submit the results directly to the Audit Committee, including establishment of the Internal Control Unit for conducting annual assessment of adequacy and appropriateness of internal control system, to ensure that they are in line with the operational objectives of the PTTEP Group, in compliance with relevant laws and regulations, and in trust of the management, investors, and other stakeholders. The Company's internal control system is comparable to those accepted by the international standards, considering the control environment, risk assessment relative to objectives, effective control plans, internal and external provisions of adequate and reliable information and communications, as well as routine monitoring and evaluation procedures.

4) Risk Management

The Board is responsible for regulating and overseeing management of the risks which can potentially deter PTTEP from achieving our strategic goals. The Board appoints the Risk Management Committee, a standing sub-committee that monitors and ensures efficient and effective risk management for the PTTEP Group as defined by the Risk Management Charter. The Risk Management Committee is also assigned to determine and assess key risks which are of significance at the organizational and project levels, evaluate and monitor operational plans, oversee the implementation and revision of risk mitigation to allow for a continuous evaluation of risks to ensure that the risks are at acceptable levels, as well as to report the results to the Board on a regular basis.

5) Prevention of Conflicts of Interest

The Board establishes various management measures to ensure that the management is efficient and transparent and acts in the best interest of the PTTEP Group, by assuring that the Company and our management are without any conflicts of interest. Shall anyone of the Company's directors, executives, or employees have a stake potentially leading to a conflict of interest, he or she must withdraw from participation or be abstained from voting, and subsequently inform the authority of the stake, in the given issue according to the CG&BE.

6) Compliance

The Board values the importance of full legal compliance in all of the areas in which the PTTEP Group operates. The Board also provides the Group with the support required to conform to the applicable laws as well as to properly manage compliance risks. Compliance is considered one of the keys which allow the Group to function discretely as well as to be able to operate according to our strategy towards the business goals. The Governance, Compliance, and Internal Control Department is assigned by the Board to be responsible for this matter.

Authorities of the Chief Executive Officer

1) Authority under Resolutions from the Shareholder Meetings

The Chief Executive Officer is the authorized signatory to bind PTTEP with external parties (Clause 9, Paragraph 6, of the Company's Articles of Association registered with the Ministry of Commerce).

2) Authority under Resolutions from the Board's Meetings of PTTEP

The Board authorizes the Chief Executive Officer to act and conduct, on the Company's behalf, normal course of business operations under the stated objectives in our Memorandum of Association, petroleum concessions, and other agreements, including other businesses in which the Company has interests. In addition, the Chief Executive Officer is also authorized to be the acting body, conducting the business under PTTEP regulations, namely, the Budgetary, Finance, and Accounting Charter, Regulation on Procurement, Regulation on Investment Project Management, and Regulation on Human Resources Management, by applying of the practices comparable to those of other private companies in the E&P business as well as in the best interests of the Company. The Chief Executive Officer's delegation of authority is permitted unless the concerned attorney or the delegated person has a direct or indirect conflict of interest with the Company or our subsidiaries in exercising the authority.

Segregation of Duties between the Board of Directors and Management

The Board of Directors and Management have different important roles. The PTTEP Board of Directors oversees and appoints high-level Management to manage the operations of the PTTEP Group, follows up on and evaluates the performance of Management to ensure the highest benefits for the PTTEP Group, and ensures that operations are carried out to achieve the stated goals. The Board's key role is oversight but not to become involved with day-to-day operations, which are the Management's responsibility. In this manner, there is a balance between the role of oversight and the role of carrying out day-to-day operations. Management is responsible for managing operations in line with the direction set or assigned by the Board. Management must also report the results of operations to the Board regularly.

Directors' Serving Terms and Their Directorship in Other Companies

PTTEP's Articles of Association prescribes that one-third of the Company's directors shall be retired by rotation in each AGM and that the Board shall consist of no more than 15 members. The Board, meanwhile, determines to allow each of the directors or independent directors to serve on the Board for no more than nine consecutive years, while a director who has served on the Board for nine years will not be considered for another term. This essentially allows our competent and qualified directors at the time to continuously and effectively perform their duties. PTTEP recognizes the value of knowledge and experience which our directors have earned over the years in the position. PTTEP therefore does not have a rigid limit for director's term (not more than a six-year term, for example). This is so that the Nominating and Remuneration Committee could best select the replacements for the optimal benefits of the Company and shareholders.

In terms of the qualifications, the Company's directors shall not assume a directorship in more than three listed companies at once. Details of the number of directorships held by each of the Company's directors are disclosed under the "Information of the Board of Directors, Management, Controlling Persons, and Company Secretary" section. As of December 31, 2021, none of the directors held a directorship in more than three listed companies. Meanwhile, serving a term as a member of the sub-committees is equal to that of the Board members.

Roles of the Chairman and Chief Executive Officer

The Board is authorized to elect one director to be the Chairman of the Board as well as to appoint a person to be Chief Executive Officer where the Chairman and Chief Executive Officer of PTTEP are of two different directors. The Chairman does not participate in the daily management of the business, providing that conducting and monitoring of the business policies are entirely separated from the daily operational management. Duties and responsibilities of the Chairman of the Board are as follows:

- 1) Supervise the Board to perform its duties with efficiency, according to the Board Performance Target and shareholders' expectations, with independency from the management
- 2) Determine agendas for the Board's meetings
- 3) Serve efficiently as Chairman at the Board's and the shareholders' meetings and ensure that the Company's directors perform their duties as stipulated in the CG&BE and stimulate it as the Company's culture
- 4) Support and ensure constructive relations between directors and management

For transparency and appropriateness, the Chairman is not allowed to hold any positions in any of the Company's sub-committees as clearly stated in the charter of the sub-committees. The Chief Executive Officer meanwhile is responsible for the Company's daily management with the authority as empowered and granted by the Board.

Independence of the Chairman

PTTEP considers independency as the first priority in election of the Company's Chairman of the Board. Shall there be no suitable candidate for the position, the Company's directors will be considered. The current Chairman, Mr. Krairit Euchukanonchai, is an independent director and has performed his duties with autonomy and discretion. The appraisal score of the Chairman in 2021 was 2.88 out of 3. The Chairman and his performance were appraised and examined for future improvements by the Board and the score was also disclosed in the 56-1 One Report. Details of the appraisal results are disclosed under the "Performance Appraisal of the Board" topic. In addition, all of the Company's directors are allowed to independently express their views with freedom in regard to the business operation, whether in the meetings of the Board, sub-committees, or on other occasions. This is to ensure that the management is able to operate the businesses with efficiency, accuracy, transparency, and in the best interests of the shareholders.

Policy and Practices for Chief Executive Officer, and Executives with Directorships in Other Companies

PTTEP states the principle in the CG&BE in regard to the holding of a directorship position in other companies or organizations which are not of their own or families by the Chief Executive Officer and executives. The individuals must be given an approval from the Company's authorized personnel, on an only-if-necessary and no-harms-done basis, as well as accept the condition that they shall not, in every aspect, associate PTTEP and their position held in the Company in those external activities. Meanwhile, remuneration of the Company's executives who are assigned to assume a directorship role in the organizations or units in, or related to, the petroleum exploration and production is considered PTTEP's; otherwise, the remuneration is considered theirs. Details of the number of directorships held by each of the executives are disclosed under the "Information of the Board of Directors, Management, Controlling Persons, and Company Secretary" section.

7.3 Sub-Committees

Sub-Committees

The PTTEP Board is responsible for the appointment of the directors who have expertise and knowledge in certain areas to become members of the sub-committees as specified by the Company's Articles of Association. Each of the Company's sub-committees is responsible for a specific set of tasks as determined by its respective charters. Qualifications, responsibilities, and service terms of the sub-committee members are prescribed by the Company's regulations through the designated charter. All members of the Audit Committee must be independent directors, while the majority of the members of the Nominating and Remuneration Committee, and the Corporate Governance and Sustainable Development Committee must be independent directors. The Chairman of the Board, however, is not allowed to assume any chairmanship or directorship in the sub-committees. In addition, the Chairman of each sub-committee must be an independent director. Applying to every meeting, the sub-committees are required to report the results to the Board for acknowledgment as well as to disclose them in the 56-1 One Report as the duties to be completed over the year.

Currently, the Company has four sub-committees, namely, (1) the Audit Committee, (2) the Nominating and Remuneration Committee, (3) the Corporate Governance and Sustainable Development Committee, and (4) the Risk Management Committee. Names of the directors, duties and responsibilities, numbers of meetings, meeting attendance, and remuneration policy are disclosed in the “Management Structure” section. Reports of the Company’s sub-committees meanwhile are disclosed under the “The Sub-Committees Report” topic.

7.3.1 Corporate Governance and Sustainable Development Committee

The Corporate Governance and Sustainable Development Committee has duties and responsibilities according to its charter as follows:

1) To establish the Company’s sustainable development target, policy/statement, and road map which cover all the key aspects: High Performance Organization (HPO), Governance, Risk Management, and Compliance (GRC) and Stakeholder Value Creation (SVC), and propose to the Board for approval.

2) To advise and promote the Company’s operations to be in line with the established sustainable development policy/statement, able to achieve the Company’s targets as well as comparable with the practice of leading companies. Additionally, the Committee shall promote the Board, management, and all personnel to follow the sustainable development framework effectively.

3) To evaluate and review the Company’s sustainable development target, policy/statement, and road map in response to the dynamic business environment, along with the applicable laws, related international best practices, and recommendations of leading institutions and also to consider and respond to shareholders’ proposals.

4) To oversee, monitor, and evaluate the performance of sustainable development of the Company to ensure its balance and effectiveness as well as to create utmost benefits to the Company and stakeholders and to regularly report the progress to the Board.

5) To establish the Company’s good corporate governance and business ethics policy prior to proposing to the Board for approval, advise and promote the implementation at all levels, annually review the policy for its appropriateness and alignment with the laws and the international best practices, and oversee the regularity of evaluation and report on the compliance of PTTEP’s good corporate governance and business ethics.

6) To oversee the information disclosure to stakeholders in terms of sustainable development in the Company’s annual report and sustainability report.

7) To regularly review its Charter to ensure its appropriateness and timeliness.

8) To disclose the Committee’s performance in the Company’s annual report.

9) To perform other duties as assigned by the Board.

The Corporate Governance and Sustainable Development Committee consists of at least three directors, the majority of whom must be independent directors. The Company Secretary serves as the Committee’s secretary. As of December 31, 2021, the Committee comprised four members as follows:

Admiral Tanarat Ubol	Chairman of the Committee and Vice Chairman of the Independent Directors Committee
Mr. Pitipan Tepartimargorn	Member and Independent Director
Mrs. Angkarat Priebjirivat	Member and Independent Director
Mr. Veerathai Santiprabhob	Member and Independent Director

According to its charter, the Committee must meet at least 4 times a year. In 2021, the Committee held 4 meetings which were attended by all incumbent directors. The Committee disclosed its annual performance in the Corporate Governance and Sustainable Development Committee Report for 2021.

7.3.2 Audit Committee

The Audit Committee has the duties and responsibilities according to its charter as follows:

- 1) To establish the audit committee charter as compatible with the Company's scope of work and responsibilities which must be approved by the Board and revised at least once a year.
- 2) To review the Company's financial reports with the external auditor on a quarterly basis to ensure accuracy, credibility, and adequacy.
- 3) To ensure that the Company's activities are performed in compliance with the Securities and Exchange law, SET requirements, other laws, regulations, procedures, cabinet resolutions related to the business, including the Company's rules and regulations.
- 4) To review connected transactions or transactions with potential conflicts of interest to ensure that these transactions are complied with the laws and SET's regulations and that they are reasonable as well as in the best interests of the Company, and review transactions with potential fraud which may affect the Company's operations.
- 5) To review the efficiency and effectiveness of internal control, risk management, and governance processes.
- 6) To oversee and monitor the internal audit process and ensure that the process is appropriate and effective as well as ensure independence of the Internal Audit Division in order to enhance internal audit performance.
- 7) To evaluate Internal Audit Division performance, including audit problems and difficulties at least once a fiscal year and report the results and its suggestions for improving the performance to the Board.
- 8) To consider, select and propose the appointment, including removal of an external auditor, and to propose the auditor's remuneration to the Board as well as attend a meeting with the external auditor from the State Audit Office of the Kingdom of Thailand (SAO) or the external auditor endorsed by SAO at least once a year, in the absence of the management, to review audit findings and other issues, and recommend reviews or audit of any items, if necessary.
- 9) To endorse appointment, transfer, removal, promotion, and performance appraisal of the Head of the Internal Audit Division by seeking comments from the President and Chief Executive Officer. The Audit Committee will appoint an investigation committee to investigate the case that the Head of the Internal Audit division is suspected of noncompliance with laws, the Company's rules and regulations, and the Good Corporate Governance and Business Ethics of PTTEP Group.
- 10) To approve a risk-based internal audit plan and instruct internal auditors to conduct other duties as appropriate, taking into consideration the Company's benefits as well as the impact on independence and objective of the audit.
- 11) To endorse the budget, division structure, and manpower of the Internal Audit Division for the management to propose to the Board.
- 12) To approve the charter of the Internal Audit Division.
- 13) To approve the Conflicts of Interest Declaration Form when the Head of the Internal Audit Division has to personally conduct audit fieldwork.
- 14) To endorse the results of audits which were approved in the annual audit plan as well as special audit requests.

15) The Chairman of the Audit Committee or a member must attend the shareholders' meeting to answer questions in regard to the Committee's duties or the appointment of the external auditor.

16) To review the accuracy of self-assessment and related documents in regard to anti-corruption measures in reference to Thailand's Private Sector Collective Action Coalition Against Corruption (CAC).

17) To perform other duties as assigned by the Board upon its consent.

18) To report the Audit Committee's performance on internal audit to the Board at least on a quarterly basis, within 60 days from the end of each quarter, except for the fourth-quarter report, which is required as an annual report. Such reports must be submitted to the regulating ministry of the Company's parent company and the Ministry of Finance within 90 days from the end of the accounting year for acknowledgment. The committee's annual report must also be disclosed in the Company's annual report.

The Audit Committee consists of at least three directors, but not more than five directors, all of whom must be independent directors. The Head of the Internal Audit Division acts as the Committee's secretary. As of December 31, 2021, the Committee comprised four members as follows:

Director's Name	Position	Financial Statements Audit Experience
Mr. Achporn Charuchinda	Chairman of the Audit Committee	• 2013 - 2017 Board Member, The Bank of Thailand • 2013 - 2016 Director, Thai Smile Airways Co., Ltd. • 2013 - Jul. 2014 Chairman of the Audit Committee, Metropolitan Waterworks Authority • 2007 - 2013 Chairman of the Audit Committee, Bank of Thailand's Financial Institutions Development Funds
Mr. Dechapiwat Na Songkhla	Member of the Audit Committee	• 2017 - Sep. 2021 Director of the Budget Bureau • 2015 - 2017 Deputy Director of the Budget Bureau • 2012 - 2015 Senior Advisor of the Budget Bureau • 2010 - 2012 Director of the National Security Budget Preparation Office 1 • 2009 - 2010 Director of the Special Public Organizations and State-Owned Enterprises Budget Preparation Office • 2008 - 2009 Budget Analyst, Expert Level, Budget Bureau
Mrs. Angkarat Priebjivat	Member of the Audit Committee	• 2016 - Present Member of the Audit Committee, TSFC Securities Plc. • 2013 - Present Member of the Audit Committee, TISCO Financial Group Plc. • 2013 - Present Member of the Audit Committee, TISCO Bank Plc.

Director's Name	Position	Financial Statements Audit Experience
		• 2012 - Present Member of the Audit Committee, Thai Public Broadcasting Service (Thai PBS) • 1992 - Present Technical Advisor, Listing and Disclosure Department, The Stock Exchange of Thailand • 2008 - Feb. 2021 Chairman of the Audit Committee, COL Plc. • 2018 - 2020 Member of the Audit Committee, TOT Corporation Plc. • 2018 - 2020 Member of the Technical Advisory Committee for Financial Reporting Standards, Office of the Securities and Exchange Commission • 2018 - 2019 Member of the Finance and Accounting Subcommittee, State Railway of Thailand • 2014 - 2018 Member of the Audit Committee, Tourism Authority of Thailand
Ms. Penchun Jarikasem	Member of the Audit Committee	• 2020 - Present Sub-committee on Finance and Accounting of the Energy Conservation Fund • 2018 - Present Chairman of the Audit Committee, Ritta Holdings Co., Ltd. • 2016 - Present Chairman of the Audit Committee, Osotspa Plc. • 2018 - 2019 Chairman of the Sub-committee for Finance and Accounting, State Railway of Thailand • 2016 - 2018 Sub-committee for Finance and Budgeting Improvement, Office of the Public Sector Development Commission (OPDC) • 2011 - 2015 Executive Vice President, Finance and Accounting Group, PTT Exploration and Production Plc.

All members of the Committee were capable with knowledge, expertise, and experience in auditing financial statements. One of the members, Mrs. Angkarat Priebjriyat, holds a degree in accounting.

According to the Audit Committee Charter, the Committee must hold at least one meeting on a quarterly basis. In 2021, the Committee held 14 meetings which included a meeting that was conducted together with the Risk Management Committee. The majority of incumbent directors attended all meetings. The Committee disclosed its annual performance in the Audit Committee Report for 2021.

7.3.3 Nominating and Remuneration Committee

The Nominating and Remuneration Committee has the duties and responsibilities according to its charter as follows:

- 1) To select and nominate individuals who are qualified to be the Company's directors or the Chief Executive Officer (CEO) when there is a vacancy or to replace those whose terms have expired, or an Acting CEO when there is a vacancy while the nomination process is still underway for election by the Board or the shareholders, considering the Board's composition, knowledge, capability, their useful experience to the Company, number of companies in which they are serving as a director, as well as their conflicts of interest.
- 2) To consider the CEO's succession plan and appropriate executive-level management development system to ensure the skills and qualifications as required to achieve the Company's target growth.
- 3) To approve the Skill Mix and prepare a list of possible candidates for the Company's directors, CEO, or Acting CEO in advance and/or when there is a vacancy and propose the opinions to PTT's Board of Directors for acknowledgment and to supplement the nomination selection decision before submission to the Board for consideration and to the Annual General Shareholders' Meeting (as applicable).
- 4) To consider the annual Board Performance Target and Performance Agreement of the CEO, to propose them to the Board for approval, as well as to set the Performance Evaluation Form of the Chairman, directors, sub-committees, and the CEO.
- 5) To consider and propose qualified directors to be members or the chairmen of sub-committees when there are vacancies as well as to propose a restructuring of the sub-committees as deemed appropriate.
- 6) To consider organization restructuring to support corporate growth and changes in the business environment.
- 7) To consider the remuneration of the Board and sub-committees prior to proposing it at the Annual General Shareholders' Meeting for approval, using fair and reasonable criteria or principles, while ensuring that the remuneration is in line with the individuals' performances, the Company's performance, industry practices, as well as the scopes of duties and responsibilities.
- 8) To consider remuneration of the CEO and the salary structure of the Company's executives with fair and reasonable criteria or principles prior to proposing it to the Board for approval, whereas the remuneration of the CEO must be in line with his or her duties and responsibilities as well as performance.
- 9) To report performance of the Committee to the Board and disclose it in the Company's annual report.
- 10) To regularly review and update its own charter to ensure its appropriateness.
- 11) To perform other duties as assigned by the Board.

The Nominating and Remuneration Committee consists of at least 3 directors, the Chairman and the majority of the members must be independent directors. The Company Secretary serves as the Committee's secretary. As of December 31, 2021, the Committee comprised 6 members with 5 independent directors as follows:

Mr. Bundhit Eua-arporn	Chairman and Independent Director
Mr. Achporn Charuchinda	Member and Independent Director
Admiral Tanarat Ubol	Member and Vice Chairman of the Independent Directors Committee
Lieutenant General Nimit Suwannarat	Member and Independent Director
Mr. Pitipan Teparimargorn	Member and Independent Director
Mr. Patchara Anuntasilpa	Member

According to its charter, the Committee must meet at least 2 times a year. In 2021, the Committee held 8 meetings and the majority of incumbent directors attended all meetings. The Committee disclosed its annual performance in the Nominating and Remuneration Committee Report for 2021.

7.3.4 Risk Management Committee

PTTEP's Risk Management Committee holds the following duties and responsibilities according to its charter:

- 1) Define Enterprise Risk Management Policy and Framework including providing guidance and recommendations to the Board and managements on key risks and mitigations.
- 2) Review Risk Appetite Statement prior to the Board approval as well as approve corporate level Risk Metrics & Limits and monitor the results regularly.
- 3) Ensure effective establishment and implementation of enterprise-wide risk management by enhancing the level of risk awareness within PTTEP through the development of procedures and commitment of resources appropriately.
- 4) Maintain an enterprise-wide view of risks which are related to the Corporate Direction in the businesses i.e. E&P, related businesses, and other businesses in which PTTEP invests, as well as to recommend mitigation strategies to manage the risks to keep them within the acceptable level according to clause (2) and to continuously monitor, assess, and improve the mitigation strategy in responding to any changes of the business environment.
- 5) Support Risk Management Function in assessing key risks and advise on other potential risks which may impact the Company on continuous and efficient risk management comparable to leading companies as well as assign tasks related to PTTEP risk management for the Risk Management Function to perform.
- 6) Report key risks and results of risk management to the Board regularly and promptly alert all concerned any significant events related to risk management to the Board.
- 7) Disclose the committee's performance in the Company's annual report.
- 8) Regularly review and update its own charter to ensure its appropriateness.
- 9) Perform other duties relating to PTTEP risk management as may be assigned by the Board.

The Risk Management Committee consists of at least 3 directors, while at least one of which must be an independent director. As of December 31, 2021, the Committee comprised 6 members, 4 of which were independent directors as follows:

Ms. Panchun Jarikasem	Chairman and Independent Director
Lieutenant General Nimit Suwannarat	Member and Independent Director
Mr. Pitipan Tepartimargorn	Member and Independent Director
Mr. Atikom Terbsiri	Member
Mr. Veerathai Santiprabhob	Member and Independent Director
Mr. Wattanapong Kurovat	Member

Mr. Wattanapong Kurovat assumed the membership in replacement of Mr. Twarath Sutabutr on May 1, 2021.

According to its charter, the Committee must hold a meeting at least 4 times a year. In 2021, the Committee held 13 meetings, which included the meeting that was conducted together with the Audit Committee. The majority of incumbent directors attended all the meetings. The Committee disclosed its annual performance in the Risk Management Committee Report for 2021.

7.3.5 Independent Directors Committee

The Independent Directors Committee holds the following duties and responsibilities according to its charter:

- 1) To propose to the Board and/or the President and Chief Executive Officer (as applicable) significant matters which are beneficial to the Company as well as major and minor shareholders.
- 2) To advise the Board and independent directors on their roles and responsibilities for the benefit of the Company as well as the major and minor shareholders.
- 3) To review the Company's operations to ensure that they comply with the laws relevant to independent directors, as well as to review the definition of independent directors to be lawfully appropriate and complete.
- 4) To perform other duties as assigned by the Board, provided that such duties do not affect the Committee's independence.
- 5) To regularly review and update the Independent Directors Committee Charter to ensure its appropriateness.

Those who meet all of the qualifications of independent directors according to the CG&BE are considered independent directors without any appointment from the Board of Directors. As of December 31, 2021, the Committee comprised 10 members as follows:

Mr. Krairit Euchukanonchai	Chairman
Admiral Tanarat Ubol	Vice Chairman
Mr. Achporn Charuchinda	Member
Lieutenant General Nimit Suwannarat	Member
Mr. Pitipan Tepartimargorn	Member
Mr. Veerathai Santiprabhob	Member
Mr. Bundhit Eua-arporn	Member
Mr. Dechapiwat Na Songkhla	Member
Mrs. Angkarat Priebjrivat	Member
Ms. Panchun Jarikasem	Member

According to its charter, the Committee must meet at least 4 times a year with the Company Secretary serving as the Committee's secretary. In 2021, the Committee held 4 meetings, and the majority of incumbent directors attended all meetings. There was no compensation paid to the members of the Committee for their meeting attendance. The Committee disclosed its annual performance in the Independent Directors Committee Report for 2021.

7.4 The Management

7.4.1 List of Management Name

As of January 1, 2022, PTTEP's management, according to the definition of management as defined by the Capital Market Supervisory Board (CMSB), consists of 17 members. Details of their biography, qualifications, and experience are disclosed under the "Information of the Board of Directors, Management, Controlling Persons and Company Secretary" section.

List of Names and Number of Shares held by the Management, their Spouse/Cohabiting Couple and Minor Child

List of Name	Number of Ordinary Shares		
	As of January 1, 2021	As of January 1, 2022	Increase/(Decrease) During the Year
1. Mr. Montri Rawanchaikul	52,050	52,050	-
Spouse/Cohabiting Couple	8,900	8,900	-
Chief Executive Officer			
2. Mr. Chayong Borisuitsawat	65,096	65,096	-
Executive Vice President, Human Resources, Corporate Affairs, and Assurance Group			
3. Mr. Sumrid Sumneing	13,000	13,000	-
Executive Vice President, Finance and Accounting Group			
4. Mrs. Natruedee Khositaphai	107,457	107,457	-
Spouse/Cohabiting Couple	10,000	0	(10,000)
Executive Vice President, Strategy and Business Development Group			
5. Mr. Suksant Ongvises	30,681	30,681	-
Executive Vice President, Operations Support Group			
6. Mr. Piya Sukhumpanumet	89,916	89,916	-
Executive Vice President, Geosciences, Subsurface, and Exploration Group			
7. Mr. Nirandorn Rojanasomsith ¹	N/A	110,202	N/A
Spouse/Cohabiting Couple	N/A	38,839	N/A
Executive Vice President, Production Asset Group			

¹ Appointed as Acting Executive Vice President, Production Asset Group effective on February 1, 2021, and appointed as Executive Vice President, Production Asset Group effective on August 1, 2021 (Number of ordinary shares held on appointment date were 197,702 shares as held by himself and 38,834 shares as held by his spouse/cohabiting couple).

List of Name	Number of Ordinary Shares		
	As of January 1, 2021	As of January 1, 2022	Increase/(Decrease) During the Year
8. Ms. Kanita Sartwattayu ²	N/A	60,279	N/A
Acting Executive Vice President, Engineering and Development Group			
9. Mr. Sermsak Satchawannakul	45,215	45,215	-
Senior Vice President, Accounting Division			
10. Ms. Orachon Ouyiamapun	-	-	-
Senior Vice President, Finance Division			
11. Mr. Sakchai Sarawek	-	-	-
Vice President, Managerial Accounting Department			
12. Mrs. Netsuda Pokkasorn	66,005	66,005	-
Vice President, Insurance Department			
13. Mr. Anutra Bunnag	-	-	-
Vice President, attached to Senior Vice President of Finance Division, assigned as Managing Director of PTTEP Treasury Center Co., Ltd.			
14. Ms. Pratamaporn Deesrinthum	53,249	53,249	-
Vice President, Accounting Policy and Solutions Department			
15. Ms. Nuchanong Sangkeaw	4,605	4,605	-
Vice President, Capital Market and Financial Planning Department			
16. Mrs. Yada Vudhivorn	5,173	5,173	-
Vice President, Tax Department			
17. Mrs. Vanasanan Boonyalerdlak	-	-	-
Vice President, Financial Accounting Department			
Management Who Retired or Rotated during 2021			
1. Mr. Phongsthor Thavisin ³	101,037	N/A	N/A
2. Mr. Kanok Intharawijitr ⁴	47,231	N/A	N/A

² Appointed as Acting Executive Vice President, Engineering and Development Group effective on December 1, 2021 (Number of ordinary shares held on appointment date was 60,279 share).

³ Ceased to perform the role of Chief Executive Officer effective on October 1, 2021 (Number of ordinary shares held on the last date in his position at September 30, 2021, were 101,037 shares).

⁴ Retired from the position of Executive Vice President, attached to Chief Executive Officer effective on January 1, 2022 (Number of ordinary shares held on the last date in his position of December 31, 2021, were 33,231 shares).

7.4.2 Management's Remuneration Policy

Remuneration of the Chief Executive Officer

Remuneration of the Chief Executive Officer (CEO) is determined using fair and appropriate procedures and defined under the principles which are unbiased, reasonable, justifiable, and transparent. PTTEP's Nominating and Remuneration Committee is responsible for reviewing remuneration of the CEO prior to proposing for the Board's approval. The approval from the Board is based on his or her performance, duties and responsibilities, the Company's performance, remuneration of listed companies comparably in size and industry, and overall economic situation. The CEO's remuneration consists of both short and long-term arrangements.

The ratio of annual compensation of the CEO compared to the average annual compensation of the Company's executives is approximately 1.45 : 1, while the ratio of annual compensation of the CEO compared to the average annual compensation of the Company's employees is approximately 9.74 : 1

Remuneration of the Executives

PTTEP's Nominating and Remuneration Committee is responsible for the salary structure of the Company's executives. The key principle is to establish an unbiased and reasonable structure which reflects, not only the Company's own business nature and its performance but also some of the variables which can be compared to and justified by those of other leading energy companies in the industry. The Board must give approval to the structure prior to the implementation.

The Chief Executive Officer, meanwhile, is responsible for reviewing the appropriateness of the remuneration of each of the executives as well as their annual salary increase, taking into consideration his or her overall target-based performance and the Company's performance.

To maintain the Company's remuneration competitiveness, PTTEP conducts an annual survey on remuneration of leading companies in the industry. The information gathered through the survey allows the Remuneration Committee to better understand the current market situation to further increase the Company's competitiveness in the job market as well as to be able to provide the Board with thorough explanations particularly when the changes in the salary structure and payment method are drastic. The ratio of the average annual compensation of the executives compared to the average annual compensation of the Company's employees is approximately 7.1 : 1

Remuneration of the Executives

	2020		2021	
	Number	Total Amount (THB)	Number	Total Amount (THB)
Salary	10	92,116,390	9 ¹	83,376,340
Bonus ²		45,926,257		52,410,220
Other compensation ³		11,896,838		9,465,167
Total		149,939,484		145,251,727

In 2021, compensation (salary, bonus, and contribution to the provident fund) of PTTEP's and the subsidiaries' employees, including wages of the seconded employees, totaled THB 10,779,595,825.

Remuneration of the Directors of Subsidiaries and Associated Companies

PTTEP's subsidiaries and associated companies are functional units of the Company in carrying out E&P and related businesses including new business in order to optimize the Company's benefits, taking into account the business and investment conditions. PTTEP assigns the Company's management to hold a directorship position in our subsidiaries and/or associated companies in order to ensure that they are managed in compliance with the business direction and strategy of PTTEP.

PTTEP has set up a policy for directors' remuneration of subsidiaries and associated companies. The directors' remuneration policy is based on the roles and authorities of the Board of directors of such subsidiaries and associated companies, their size of investment, and business risks. The management who are assigned to be directors of subsidiaries or associated companies are entitled to an additional remuneration with subject to the remuneration policy of such subsidiaries or associated companies.

¹ Executives consisted of the Chief Executive Officer, President of the Exploration and Production, Executive Vice Presidents and equivalent, and PTT's executives who have been seconded to PTTEP.

² Annual bonus shall be paid in January in the following year.

³ Provident Fund

7.5 Personnel

7.5.1 Number of Employees

As of December 31, 2021, PTTEP and our subsidiaries had a total workforce of 4,564 employees.

Number of Employees*

Employee Type	Total (Persons)
Thai Permanent Employees	2,013
Thai Contracted Employees	1,498
Non-Thai Contracted Employees	65
Local Employees in Overseas Subsidiaries	983
Seconded Employees from PTT Group Companies and Joint Venture Partners	5
Total	4,564

Remarks: * Based on the Company's database as of December 31, 2021.

The list is exclusive of Restart Thailand Project staff, outsourced staff hired through services contracts, and third-party service providers. M&A and Divestment conditions are excluded.

Number of Employees in Each Function Group¹

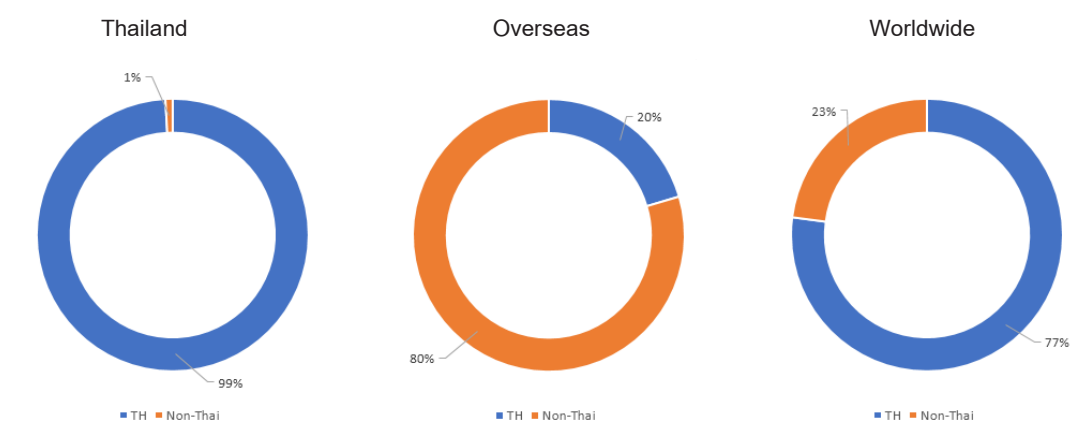
Function Group ²	Thai Permanent Employee	Thai Contracted Employee	Non-Thai Contracted Employee	Local Employee	Seconded Employee	Total
Chief Executive Officer	10	9	-	-	1	20
Engineering and Development Group	218	156	1	27	-	402
Finance and Accounting Group	137	142	-	-	3	282
Geosciences, Subsurface and Exploration Group	229	56	16	-	-	301
Human Resources, Corporate Affairs, and Assurance Group	141	73	1	-	1	216
Operations Support Group	362	382	15	-	-	759
Production Asset Group	750	642	30	956	-	2,378
Strategy and Business Development Group	73	11	-	-	-	84
Internal Audit Division	14	2	-	-	-	16
Legal Division	20	2	-	-	-	22
Safety, Security, Health, and Environment Division	40	21	1	-	-	62
New Business Division	19	2	1	-	-	22
Grand Total	2,013	1,498	65	983	5	4,564

Remarks: ¹ Based on the Company's database as of December 31, 2021.

² Based on the Company's organization structure as of December 31, 2021.

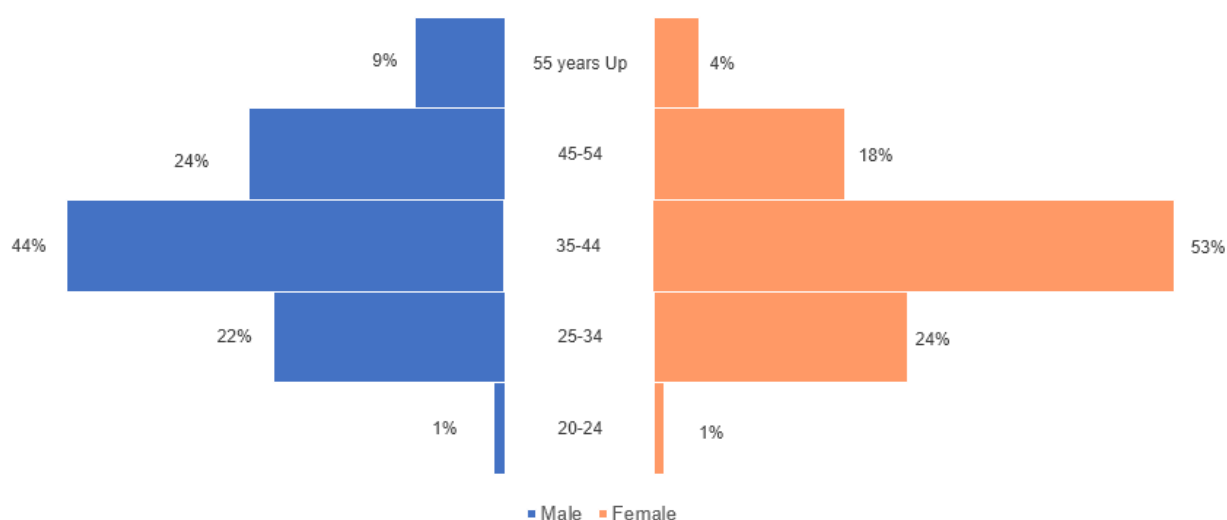
The list is exclusive of Restart Thailand Project staff, outsourced staff hired through services contracts, and third-party service providers. M&A and Divestment conditions are excluded.

Staff Demography by Nationality and Work Location¹



Remark: ¹ Based on the Company's database as of December 31, 2021.

Staff Demography by Gender and Age¹



Remark: ¹ Based on the Company's database as of December 31, 2021.

Employee Turnover

	IN ^{1, 3}	OUT ^{1, 2}
Thai Permanent Employees	22	76
Thai Contracted Employees ³	235	52
Non-Thai Contracted Employees	7	27
Local Employees	103	49
Seconded Employees	1	-

Remarks: ¹ Based on the Company's database as of December 31, 2021.

² Including voluntary resignation, dismissal, early retirement, retirement, death

³ The turnover was exclusive of Restart Thailand Project staff, outsourced staff hired through services contracts, and third-party service providers. M&A and Divestment conditions are excluded.

Turnover Rate

In 2021, the Company's total employee turnover rate (Voluntary resignation, dismissal, early retirement, retirement, death) was 4.5%.

Voluntary Turnover Rate

The voluntary resignation rates (resignation and early retirement) in 2017 through 2021 were as shown below.

2017	2018	2019	2020	2021
3.9%	3.7%	2.5%	1.7%	3.1%

Remark: M&A and Divestment conditions are excluded.

7.5.2 Human Resources Development Policy

To increase the organization's capability and accelerate the competency development of the Company's staff for continuous expansion of the business domestically and internationally, PTTEP has developed and improved the capability development system and process by implementing a competency-based 70 : 20 : 10 model of on-the-job training, coaching and mentoring, and formal training, respectively. In 2021, the Company provided training and development programs to employees through the following channels:

1) In-House and External Training

The Company provides in-house and external trainings, domestically and overseas, to staff and management at all levels. These trainings comprise a wide variety of courses, including technical and functional training, and Safety, Security, Health and Environment (SSHE) training, such as digital skills, foreign language, business administration, and leadership skills. Moreover, in 2021, PTTEP started transforming the Company towards digital organization, changing the way of working to be more agile, more efficient, faster, and exploring new business opportunities in preparation for future growth. Even though the COVID-19 outbreak is still a long way off our countries, the Company continually implemented online learning and reformatted many development programs in order to support self-learning via digital learning tools.

2) Long-term Training and Development Programs

Long-term training and development programs are aimed to prepare our employees for roles and assignments in the Company's current and future projects. The programs are generally provided to selected employees based on their Individual Development Plan (IDP) in 1-3 years. Under this approach, the employees are required to undertake on-the-job trainings through various assignments relating to the Company's projects or to be temporarily assigned to work with the Company's business partners or services companies in Thailand and overseas. In the technical areas, mentors are also assigned to assist and coach the employees along their development journeys.

3) Master's Degree Scholarship Programs for Employees

The Company provides scholarships to employees to help them pursue master's degrees in world-class universities all over the world in the following fields:

- 1) Petroleum Geosciences
- 2) Petroleum Engineering
- 3) Engineering
- 4) Drilling and Well Engineering
- 5) Digital and Information Technology

The Company also provides master's degree scholarships for employees to study in Thailand's reputable institutes as follows:

- 1) Business Administration (Executive), SASIN Graduate Institute of Business Administration of Chulalongkorn University
- 2) Petroleum Geoscience (International Program), Chulalongkorn University
- 3) Applied Geophysics (International Program), Chiangmai University

In 2021, the Company invested in human capital development programs at the total amount of THB 77,037,278 and provided more than 220,590 training and development hours for our employees with an average of 48 training and development hours per person per annum. PTTEP has policy for management in implementing the Individual Competency Development Plan (ICDP) for PTTEP Staff. To ensure the standardization, PTTEP has conducted the Technical Competency Assessment Calibration with Job Family Masters in each Job Family. As a result, our 2021 employees' competency increased by approximately 5.45%

The Company calculated the Human Capital Return on Investment (HCROI) in several dimensions. These include man-hours and cost spent on development activities against total revenue and production, time to autonomy of young technical professionals, and readiness of immediate successors for senior management positions, as well as continuous development of additional measurements to evaluate the HCROI more efficiently. The results are subsequently used to evaluate and elevate the efficiency and effectiveness of the development activities for further and future improvement.

7.6 Other Significant Information

7.6.1 Secretary to the Board of Directors

The Board of Directors appointed Mrs. Pranot Tirasai, Former Executive Vice President, attached to the President and Chief Executive Officer, and assigned to act as Secretary to the Board of Directors, effective from October 1, 2018. The Secretary of the Board of Directors serves as the focal point between the Board and the management and is responsible for providing advice to the Board on legal compliance regarding the duties and responsibilities of the Board and the management. The Secretary of the Board of Directors is also the accountable person for reviewing the agenda and Minutes of the Board's meetings prior to their submission to the Board, and managing documentation of the Shareholders' meeting, as well as preparation for the Board for the Shareholders' meeting. Mrs. Pranot Tirasai holds a degree in law and is highly knowledgeable, capable, and experienced, allowing her to appropriately support the Board in carrying out its fiduciary duties.

7.6.2 Company Secretary

The Board of Directors resolved to appoint Mrs. Maneeya Srisukhumbowornchai, Senior Vice President, Corporate Secretary Division, as the Company Secretary and Secretary of the Corporate Governance and Sustainable Development Committee, Secretary of the Nominating and Remuneration Committee, and Secretary of the Independent Directors Committee since September 1, 2019. Mrs. Maneeya holds a degree in accounting. She is highly knowledgeable, capable, and experienced in corporate secretarial functions. In addition, she has attended seminars and completed necessary trainings which are beneficial to her role. Detail of the Company Secretary is disclosed under the "Information of the Board of Directors, Management, Controlling Persons, and Company Secretary" section.

The Company Secretary has performed roles with fiduciary duties by holding responsibilities, and duties on care and loyalty to the Company, as required by the Securities and Exchange Act, including preparing and safeguarding the Company's important documents, namely the director registry, notice of the Shareholders' meetings, notice of the Board's meetings, Minutes of the Shareholders' meetings, Minutes of the Board's meetings, and Annual Reports; safeguarding the Conflicts of Interests Report submitted by the members of the Board and management as well as sending a copy of the report to the Chairman of the Board and Chairman of the Audit Committee, as stipulated by law.

The Company Secretary is also responsible for the following duties as required by the Board:

- Overseeing and advising the Board to ensure that the directors perform their roles in compliance with relevant applicable laws, rules and regulations as well as the Company's objectives, Articles of Association, resolutions from the Board's and shareholders' meeting.

- Organizing meetings of the Board, sub-committees, and shareholders.
- Providing orientation and giving pieces of advice to new members of the Board.
- Recommending necessary and appropriate training programs to members of the Board.
- Coordinating with the Company's functional units to ensure that the Company's business operations are in line with the direction set by the Board and shareholders' meeting and work with external regulators who oversee listed companies.

- Governing the Company's subsidiaries, including preparing and safeguarding their important documents.
- Promoting and educating the directors, management, and employees about the Good Corporate Governance and Business Ethics of the PTTEP Group and ensuring full compliance of such policy, including reviewing the PTTEP Group's CG&BE to comply with related laws and in line with international practices of leading organizations.

- Ensuring that all shareholders are treated fairly, ethically, and lawfully as well as promoting good relationships with minority shareholders.

- Acting as a focal point who is responsible for coordinating with relevant parties when reports or complaints were submitted through the Whistleblowing System of the PTTEP Group.

- Performing other duties as required by the Company.

7.6.3 Head of the Internal Audit Division

PTTEP has established the Internal Audit Division, which has a direct reporting line to the Audit Committee and an administrative (dotted-line reporting) reporting line to the President and CEO. Key roles, responsibilities, and the scope of work of the Internal Audit Division include:

1) In-house and Subsidiary Audits

The purpose of the audits is to ensure that the operations achieve the Company's targets. The auditors evaluate the efficiency, adequacy, and effectiveness of governance, risk management, and internal controls in a continuous effort to detect and prevent all types of deceptive schemes with potential fraudulent activities, or schemes which can potentially lead to illegal wrongdoings. The audits and the processes involved are also developed to identify control weaknesses which could potentially open opportunities for frauds as well as to provide recommendations for the enhancement of the internal controls.

2) Joint Venture and Joint Operating Company Audits

The auditors conduct audits on the operators for projects that PTTEP has invested in to ensure that the operators comply with the joint venture agreements and other related contractual arrangements, they possess appropriate internal controls and the expenditure incurred and reported is equitable, reasonable, and accurate for the benefit of all parties involved.

3) Digital Technology Audit

The auditors conduct audits to review and assess the efficiency and effectiveness of IT-related controls of digital technologies utilized in the Company. This is to reasonably ensure that management of enterprise IT achieves the Company's business objectives in core aspects of benefits realization, risk optimization, and resource optimization.

4) Consulting Services

The auditors pre-determine the scope of the consulting services prior to the engagement, ensuring that they will result in improved efficiency and effectiveness of the existing processes as well as useful recommendations on risk management, internal controls, and corporate governance.

5) Fraud Investigation

The Head of the Internal Audit Division is responsible for undertaking investigations of all reported or suspected frauds in accordance with the Reporting and Whistleblowing Regulation B.E. 2556. Investigation team members must not bear any conflicts of interest on complaints under the investigation. Prevention, detection, further investigation, and prosecution of fraud offenders are however the responsibility of the management.

6) Special Audit Requests

Special audit requests are not included in the annual audit plan. The Internal Audit Division performs special audits as requested by the Company's management and/or the Audit Committee to prevent and mitigate risk.

According to the Audit Committee Charter, the Audit Committee has a duty to endorse the appointment, transfer, removal, promotion, and performance appraisal of the Head of the Internal Audit Division.

Ms. Yaninee Wajeepratubjit has held the position of Senior Vice President of the Internal Audit Division and Head of the Internal Audit Division since January 1, 2021. The Audit Committee deems that the afore-mentioned executive is qualified to undertake the responsibility based on her educational background, necessary knowledge, skills, and work experiences. She has also been up-to-date in terms of professional knowledge and expertise, primarily through extensive training on internal auditing methodologies, management programs, and internal auditor competency development. Such stringent attention to the person holding the title and the support provided to the entire team highlight the importance which the Company has placed on the efficiency and effectiveness of the Internal Audit Division and performance of the Audit Committee.

The details of the Head of the Internal Audit Division are disclosed in Attachment 3: Details of Head of the Internal Audit Division and Head of the Compliance Function.

7.6.4 Head of the Compliance Function

PTTEP has established the Governance, Compliance, Internal Control, and Subsidiary Management Department which has a direct reporting line to the Senior Vice President of the Corporate Secretary Division, the Executive Vice President of the Human Resources, Corporate Affairs, and Assurance Group, and the Chief Executive Officer, respectively. The key responsibilities are to promote and ensure that the PTTEP Group operates in full compliance with all applicable laws as well as to support the management in managing compliance risk efficiently through various compliance programs. This includes providing communication and training programs, developing and maintaining the legislation database, identifying and conducting compliance risk assessment, providing advice on new issuance or amendment of the PTTEP Group's internal regulations, coordinating with regulators, and regularly reporting the performance of the compliance programs to the Audit Committee and the management.

Head of the Compliance Function in 2021 was: Ms. Chalida Srikorakul had been appointed as the Vice President of the Governance, Compliance, Internal Control, and Subsidiary Management Department from January 26, 2021, up to the present.

More details of the Head of the Compliance Function are disclosed in Attachment 3: Details of Head of the Internal Audit Division and Head of the Compliance Function section.

7.6.5 Head of the Investor Relations

Details are disclosed under the "Investor Relations" topic.

7.6.6 Remuneration of Auditor

1) Audit Fee

In 2021, PTTEP and the subsidiaries, both domestic and overseas, paid audit fees for the following:

1.1) PwC and person or companies related to the auditor and the audit firm ¹	0.71	Million USD	(22.59 Million Baht)
1.2) Other auditors than 1.1)	<u>1.22</u>	Million USD	(<u>39.02</u> Million Baht)
Total	<u>1.93</u>	Million USD	(<u>61.61</u> Million Baht)

2) Non-Audit Fee ²

In 2021, PTTEP and its subsidiaries paid non-audit fees to the audit firm of PTTEP (PwC) and persons or companies related to the auditor and the audit firm for a total of USD 0.27 million (THB 8.66 million). This majority fees were charged for tax service and other services through the procurement process.

Summary of the Auditors' Report for the Past Three Years (2019-2021)

The auditors have expressed an unqualified opinion in the Auditors' Report on the PTTEP's consolidated financial statements for the past three years.

¹ In accordance with the definition of Securities and Exchange Commission of Thailand (SEC)

² "Non-Audit Fee" is a terminology commonly used by SEC reporting requirement.

8. Corporate Governance Milestones

8.1 Summary of Board's Performance in the Past Year

8.1.1 Nomination, Development, and Performance Assessment of the Board

(1) Independent Director

PTTEP's Definition of Independent Directors

The Good Corporate Governance of PTTEP has defined the qualifications of the Company's independent directors more strictly than those defined by the Capital Market Supervisory Board, specifically in the area of shareholding as clarified in 1) below. The definition of an independent director, whose qualifications are annually reviewed, is as follows:

1) Holding shares not exceeding 0.5% of the total number of shares with voting rights of PTTEP, our parent company, subsidiary companies, associated companies, major shareholders, or controlling persons, including shares held by related persons of the independent director.

2) Neither being nor used to being an executive director, employee, staff member, or advisor who receives salary, or a controlling person of PTTEP, our parent company, subsidiary companies, associated companies, sister subsidiary companies, major shareholders, or controlling persons, unless the foregoing status has ended for not less than two years prior, excluding the case where the independent director used to be a government official or advisor of a government unit, which is a major shareholder or a controlling person of the Company.

3) Not being a person related by blood or legal registration as a father, mother, spouse, sibling, and child, including the spouse of a child of the Company's directors, executives, major shareholders, controlling persons, or persons to be nominated as a director, executive, or controlling person of PTTEP or one of the subsidiaries.

4) Neither having nor used to having a business relationship with PTTEP, our parent company, subsidiary companies, associated companies, major shareholders, or controlling persons in the manner which may interfere with his or her independent judgment, and neither being nor used to being a significant shareholder, or a controlling person of anyone having a business relationship with the Company, our parent company, subsidiary companies, associated companies, major shareholders, or controlling persons, unless the foregoing relationship has ended for not less than 2 years prior.

The term 'business relationship' under the first paragraph shall include normal business transactions, rental or lease of immovable property, transactions relating to assets, services, and granting or receiving of financial assistance. These include receiving or extending of loans, guarantees, collaterals, and other similar actions which can potentially result in PTTEP or his counterparty being subject to indebtedness payable to the other party in the amount, whichever is lower, of between three percent or more of the net tangible assets of the Company or THB 20 million or more. The amount of such indebtedness shall be calculated according to the method for calculation of the value of connected transactions under the Notification of the Capital Market Supervisory Board's governing rules on connected transactions *mutatis mutandis*. The consideration of such indebtedness shall include indebtedness occurred during the period of one year prior to the date on which the business relationship with the person commences.

5) Neither being nor used to being an auditor of PTTEP, our parent company, subsidiary companies, associated companies, major shareholders, or controlling persons, and not being a significant shareholder, controlling person, or partner of an audit firm which employs auditors of the Company, our parent company, subsidiary companies, associated companies, major shareholders, or controlling persons unless the foregoing relationship has ended for not less than two years prior.

6) Neither being nor used to being a provider of any professional services, including those as a legal advisor or financial advisor who receives service fees exceeding THB 2 million per year from PTTEP, our parent company, subsidiary companies, associated companies, major shareholders, or controlling persons, and not being a significant shareholder, controlling person, or partner of the provider of the professional services, unless the foregoing relationship has ended for not less than two years prior.

7) Not undertaking any businesses in the same nature and in competition with the business of PTTEP or its subsidiary companies, or not being a significant partner in a partnership or an executive director, employee, staff, advisor who receives salary or holds shares exceeding 1% of the total number of shares with voting rights of any companies which undertake a business of the same nature and in competition with that of the Company or our subsidiaries.

8) Not being a director appointed as a representative of the directors of PTTEP, major shareholders or any shareholders who are related to the major shareholders.

9) Not having any other characteristics which hamper him or her of the ability to express independent opinions in regard to PTTEP's business operations.

An independent director with the qualifications under 1) to 9), may be assigned by the Board to take part in the business decision of PTTEP, our parent company, subsidiary companies, associated companies, sister subsidiary companies, major shareholders, or controlling persons, provided that such decision shall be in the form of a collective decision.

The definition of each of the specific words mentioned is in line with the Notification of the Securities and Exchange Commission RE: Determination of Definitions in Notifications relating to Issuance and Offer for Sale of Securities.

Business Relationship or Professional Services of Independent Directors of the Company during the Past Fiscal Year

– None –

(2) Nomination of Directors and Management

Nomination of Directors

When there is a vacancy of a director position or when a director's term limit is due, it is a duty of the Nominating and Remuneration Committee to select the candidates who fit the required skills, experience, and are in line with the Company's Target Skill Mix and strategic directions to ensure that the Board's composition is complete, well-rounded, and for the optimal benefit to PTTEP. The Company thoroughly and transparently places high importance on the Board's diversity, gender, independence, and conflicts of interest. In 2021, PTTEP Board comprised 10 independent directors and 2 female directors from 15 directors.

Moreover, the Nominating and Remuneration Committee conducts Gap Analysis of the Board's current Skill Mix and Target Skill Mix, where Target Skill Mix of the Board between 2021-2022 will be considered from various skills by emphasizing the following 3 priorities;

1) Organization Change and Development: To support PTTEP in preparing the business for the changes, the operatorship transfer for newly acquired projects, the focus on organization transformation to accommodate energy transition and new business and the setup of internal control and compliance systems for new international projects, challenge on workforce diversity and human resources management, experienced director nominees in this area are essential for PTTEP to be truly an international E&P company.

2) Legal: To support legal risk management and compliance which are corporate-level risks with direct impact on the Company's license to operate, new laws in responding to new technologies and dynamic environment change especially for new businesses investment needed to be monitored regularly.

3) International Market and Collaborations: According to the Execute and Expand strategy, PTTEP aims to expand more investment into new business apart from its core E&P business with the focus on adding value to the current projects as well as promoting investment in new business projects internationally and developing its potentials in commercial and marketing. Having knowledgeable, experienced, and expert director nominees in this area, especially in commercial and marketing and international relations will be useful for PTTEP to be able to successfully invest and operate its projects internationally.

The process begins with the Nominating and Remuneration Committee considering candidates' skill alignment with the aforementioned Target Skill Mix, where the Board was able to fulfill the Target Skill Mix in Organization Change and Development in 2021 while still placing importance on future candidates who have skills in International Market and Collaborations and Legal. In addition, the Nominating and Remuneration Committee also holds the process of searching director candidates through the directors' pool of the State Enterprise Policy Office (SEPO) which comprises a list of people who are regarded as highly-qualified for state-enterprising. As of December 31, 2021, PTTEP has 7 directors whose names are listed in SEPO's directors' pool. The Company also seeks advice from the major shareholder, PTT, as well as from minor shareholders (if any) according to the rules regarding the nomination of a person to fill in the positions which are due to retirement by rotation. A list of qualified candidates must be endorsed by the State Enterprise Policy Committee, according to the Regulations of the Office of the Prime Minister on State Enterprise Policy and Governance Determination, B.E. 2557.

Election of directors to replace those who are due to retirement by rotation must obtain an approval from the AGM by a majority vote based on the number of the Company's shareholders with voting eligibility at the Meeting. The election process is as follows:

1) Should the number of the director candidates be less than the number of those to be elected, PTTEP will propose at the Meeting to elect those candidates as the directors by voting for the individual candidates, under which each of them must receive majority votes.

2) Should the number of the director candidates exceed the number of those to be elected, a ballot is to be held. Each shareholder may vote for as many director candidates as the number of the opened positions, while voting will then be carried out for each of the individuals. Those with the highest ballots will be elected, as many as the number of the opened positions. Each of them must receive majority votes.

When a director position becomes vacant for reasons other than rotation, the Board, with approval from the State Enterprise Policy Committee, may elect a new director, using the three-fourth majority voting rule. The elected director is permitted to remain in his or her directorship for only as long as the remaining term of the predecessor.

Nomination and Succession Plan of the Chief Executive Officer

The Nominating and Remuneration Committee has included in its Charter the role to consider the Chief Executive Officer succession plan and appropriate executive-level management's development system to ensure a candidate list with the skills and qualifications in line with the Company's target growth.

The Nominating and Remuneration Committee is responsible for considering the candidates' knowledge, skills, experience, and other various specific qualifications to bring about the best of interests to the Company, for example, strategic vision of energy, able to lead large investment to achieve targets, crisis management ability, working experience in Exploration and Production, ability to seek and manage New Business for the Company's sustainable growth and also looking into their probable conflicts of interest.

The Company formulates a succession plan for the Chief Executive Officer to prepare the Company for the time when the Chief Executive Officer is unable to perform his or her duties or when the serving term is completed. The plan helps to minimize the risks and the impacts, potentially resulting from the discontinuity of the management. The succession planning procedure is as follows:

1) PTT Group Management Committee (PTTGMC), a committee in which the Company's Chief Executive Officer is a director, and PTTEP forms the Group Leadership Development Program (GLDP). The program's primary focus is to enhance the capability of the PTT Group's executives, Senior Vice Presidents and above to prepare them for a possible nomination to become the Chief Executive Officer in one of the PTT Group companies.

2) PTT Management Committee (PTTMC), with PTT as the Company's major shareholder, reviews the shortlisted executive names from 1) and proposes them to PTT's Board of Directors who is responsible to select PTTEP's next Chief Executive Officer.

3) After receiving the candidate names, accompanied by opinions of PTT's Board from 2), and comparing them with the Company's potential candidates in the executive vice president level, the Company's Nominating and Remuneration Committee will reassess the individual's knowledge, capability, and experience relating to the business, conflicts of interest, and his or her vision to lead the Company to grow according to the strategic plan.

4) The Nominating and Remuneration Committee proposes the name of the final candidate, together with the opinions and a fair and reasonable package proposed by the Nominating and Remuneration Committee, to the Board of Directors for approval and appointment of the Company's Director and new Chief Executive Officer.

Nomination of Management and Succession Plan

The Board grants Chief Executive Officer an authority to select and appoint the individuals who possess the knowledge, capabilities, and experience to management positions in consultation with the Career Review Board (CRB) Committee and the presence of PTTEP Rules and Regulations for Human Resources Management. The nomination must then be acknowledged by the Board. Exceptions are made for the appointment of the Executive Vice President and above, where the Board's approval is required. If the nominee is from outside of the organization, an interview with the interview committee is required, while the nomination of the Head of Audit Function requires an approval from the Audit Committee.

PTTEP has a systematic succession planning for management of vacant positions which result from the appointment, retirement, and from reorganization to support the Company's business expansion domestically and internationally. The Career

Review Board (CRB) Committee is authorized to select and appoint successors for management positions using the Company's Management Success Profile as screening criteria. These profiles comprise organizational knowledge, experiences, competency, as well as personal attributes required for the target positions, while Currently Estimated Potential is also taken into consideration. Once the successors are identified, their individual short-term and long-term development plans will be established with focus on technique and functional knowledge, managerial skills, and soft skills required for different business areas, such as Asset Management, Business Development, Technical Support, and Business Support, according to the corporate values and organizational culture to ensure that the successors are qualified for the target positions by the time of requirement.

(3) Development of Directors

Orientation of New Directors

The orientation which is provided to the Company's new directors consists of:

1) Presentation by the Chief Executive Officer and executives: This briefing involves the nature and operational guidelines of the business, knowledge and techniques in regard to the petroleum exploration and production business and new business of the PTTEP Group, relevant rules and regulations, Good Corporate Governance and Business Ethics (CG&BE), and essential information for the directors to perform the duties with efficiency.

2) Director Manual: This contains essential information, including the strategic plan, relevant rules and regulations, and the CG&BE, which will be beneficial for the directors to perform the duties. The Manual is regularly reviewed and updated for the directors to use as a reference.

3) Operational Sites Visit: New directors visit operational sites of the PTTEP Group to enrich their understanding of the Company's operations and optimize their knowledge and experience for the benefit of the Company.

At the end of each orientation, new directors will evaluate the effectiveness of the orientation for further improvement. The director who is elected to be the Chairman and a member of a sub-committee is also required to attend an extra session and subsequently be informed of the important subjects relating to the additional new role, including performing the duties of the Chairman and a member of a sub-committee as well as conducting and leading meetings of the Company's directors and shareholders.

Development and Trainings of Directors

PTTEP's directors are knowledgeable; however, they are ambitious to learn and understand more about the business and their duties as directors. PTTEP encourages every director to acquire further knowledge through training organized by the Thai Institute of Directors Association (IOD) and other leading organizations as well as attending seminars and business visits to enhance the ability to perform their duties. To continuously provide knowledge and share opinions with the directors, the Company's management delivers lectures and exchange opinions with the Board. In 2021, 7 sessions were arranged by the Company's management which were "Pre-Strategy Review", "Strategy Review" and "Strategic Retreat" and the other 4 sessions related to Governance, Risk Management, and Compliance (GRC). The Company always updates the directors with best practices of good corporate governance for an even better understanding on a regular basis. The following are the details of the trainings, seminars, and lectures attended by the Company's directors during 2021.

Directors	Courses
1) Mr. Krairit Euchukanonchai	- Internal Lecture and Discussion Session on 2022 Pre-Strategy Review - Internal Lecture and Discussion Session on 2022 Strategy Review - Internal Lecture and Discussion Session on 2022 Strategic Retreat - Internal Lecture about GRC on the following topics: 1) Learning from The World Economic Forum 2021 2) Personal Data Protection Act, B.E. 2562 (PDPA) Implementation Plan 3) How organization's culture becomes anti-virus for organization? 4) Strategic Risk Management - Special Lecture on Upstream Insight for PTTEP Executives: Navigating through Uncertainty: Upstream Transformation, Greener Pastures – Better Future, Corporate Strategies for Resilience & NOC's: What is the Path Forward? by IHS Markit
2) Mr. Achporn Charuchinda	- Internal Lecture and Discussion Session on 2022 Pre-Strategy Review - Internal Lecture and Discussion Session on 2022 Strategy Review - Internal Lecture and Discussion Session on 2022 Strategic Retreat - Internal Lecture about GRC on the following topics: 1) Learning from the World Economic Forum 2021 2) Personal Data Protection Act, B.E. 2562 (PDPA) Implementation Plan 3) How organization's culture becomes anti-virus for organization? 4) Strategic Risk Management
3) Admiral Tanarat Ubol	- CERAWEEK 2021 - Internal Lecture and Discussion Session on 2022 Pre-Strategy Review - Internal Lecture and Discussion Session on 2022 Strategy Review - Internal Lecture and Discussion Session on 2022 Strategic Retreat - Internal Lecture about GRC on the following topics: 1) Learning from the World Economic Forum 2021 2) Personal Data Protection Act, B.E. 2562 (PDPA) Implementation Plan 3) How organization's culture becomes anti-virus for organization? 4) Strategic Risk Management - National Director Conference 2021 "Leadership behind Closed Door" by IOD - Special Lecture on Upstream Insight for PTTEP Executives: Navigating through Uncertainty: Upstream Transformation, Greener Pastures – Better Future, Corporate Strategies for Resilience & NOC's: What is the Path Forward? by IHS Markit
4) Lieutenant General Nimit Suwannarat	- Internal Lecture and Discussion Session on 2022 Pre-Strategy Review - Internal Lecture about GRC on the following topics: 1) Personal Data Protection Act, B.E. 2562 (PDPA) Implementation Plan 2) How organization's culture becomes anti-virus for organization?

Directors	Courses
5) Mr. Wattanapong Kurovat	- Internal Lecture and Discussion Session on 2022 Strategy Review - Internal Lecture and Discussion Session on 2022 Strategic Retreat - Internal Lecture about GRC on the following topics: 1) Personal Data Protection Act, B.E. 2562 (PDPA) Implementation Plan 2) How organization's culture becomes anti-virus for organization? 3) Strategic Risk Management - Special Lecture on Upstream Insight for PTTEP Executives: Navigating through Uncertainty: Upstream Transformation, Greener Pastures – Better Future, Corporate Strategies for Resilience & NOC's: What is the Path Forward? by IHS Markit
6) Mr. Pitipan Tepartimargorn	- Internal Lecture and Discussion Session on 2022 Pre-Strategy Review - Internal Lecture and Discussion Session on 2022 Strategy Review - Internal Lecture and Discussion Session on 2022 Strategic Retreat - Internal Lecture about GRC on the following topics: 1) Learning from the World Economic Forum 2021 2) Personal Data Protection Act, B.E. 2562 (PDPA) Implementation Plan 3) How organization's culture becomes anti-virus for organization? 4) Strategic Risk Management - Special Lecture on Upstream Insight for PTTEP Executives: Navigating through Uncertainty: Upstream Transformation, Greener Pastures – Better Future, Corporate Strategies for Resilience & NOC's: What is the Path Forward? by IHS Markit
7) Mr. Bundhit Eua-arporn	- Internal Lecture and Discussion Session on 2022 Pre-Strategy Review - Internal Lecture and Discussion Session on 2022 Strategy Review - Internal Lecture and Discussion Session on 2022 Strategic Retreat - Internal Lecture about GRC on the following topics: 1) Learning from the World Economic Forum 2) Personal Data Protection Act, B.E. 2562 (PDPA) Implementation Plan 3) How organization's culture becomes anti-virus for organization? 4) Strategic Risk Management - IT Governance and Cyber Resilience Program by IOD - National Director Conference 2021 "Leadership behind Closed Door" by IOD - Special Lecture on Upstream Insight for PTTEP Executives: Navigating through Uncertainty: Upstream Transformation, Greener Pastures – Better Future, Corporate Strategies for Resilience & NOC's: What is the Path Forward? by IHS Markit
8) Ms. Penchun Jarikasem	- Internal Lecture and Discussion Session on 2022 Pre-Strategy Review - Internal Lecture and Discussion Session on 2022 Strategy Review - Internal Lecture and Discussion Session on 2022 Strategic Retreat - Internal Lecture about GRC on the following topics: 1) Learning from the World Economic Forum 2021

Directors	Courses
	2) Personal Data Protection Act, B.E. 2562 (PDPA) Implementation Plan 3) How organization's culture becomes anti-virus for organization? 4) Strategic Risk Management - -Special Lecture on Upstream Insight for PTTEP Executives: Navigating through Uncertainty: Upstream Transformation, Greener Pastures – Better Future, Corporate Strategies for Resilience & NOC's: What is the Path Forward? by IHS Markit
9) Mr. Patchara Anuntasilpa	- Internal Lecture and Discussion Session on 2022 Pre-Strategy Review - Internal Lecture and Discussion Session on 2022 Strategy Review - Internal Lecture and Discussion Session on 2022 Strategic Retreat - Internal Lecture about GRC on the following topics: 1) Learning from the World Economic Forum 2021 2) Personal Data Protection Act, B.E. 2562 (PDPA) Implementation Plan 3) How organization's culture becomes anti-virus for organization? 4) Strategic Risk Management - Special Lecture Upstream Insight for PTTEP Executives: Navigating through Uncertainty: Upstream Transformation, Greener Pastures – Better Future, Corporate Strategies for Resilience & NOC's: What is the Path Forward? by IHS Markit
10) Mr. Dechapiwat Na Songkhla	- Internal Lecture and Discussion Session on 2022 Strategy Review - Internal Lecture and Discussion Session on 2022 Strategic Retreat - Internal Lecture about GRC on the following topics: 1) Learning from the World Economic Forum 2021 2) How organization's culture becomes anti-virus for organization?
11) Mr. Atikom Terbsiri	- Internal Lecture and Discussion Session on 2022 Pre-Strategy Review - Internal Lecture and Discussion Session on 2022 Strategy Review - Internal Lecture and Discussion Session on 2022 Strategic Retreat - Internal Lecture about GRC on the following topics: 1) Learning from the World Economic Forum 2021 2) Personal Data Protection Act, B.E. 2562 (PDPA) Implementation Plan 3) How organization's culture becomes anti-virus for organization? 4) Strategic Risk Management - Special Lecture on Upstream Insight for PTTEP Executives: Navigating through Uncertainty: Upstream Transformation, Greener Pastures – Better Future, Corporate Strategies for Resilience & NOC's: What is the Path Forward? by IHS Markit
12) Mrs. Angkarat Priebjivat	- Internal Lecture and Discussion Session on 2022 Pre-Strategy Review - Internal Lecture and Discussion Session on 2022 Strategy Review - Internal Lecture and Discussion Session on 2022 Strategic Retreat - Internal Lecture about GRC on the following topics: 1) Learning from the World Economic Forum 2021

Directors	Courses
	2) Personal Data Protection Act, B.E. 2562 (PDPA) Implementation Plan 3) How organization's culture becomes anti-virus for organization? 4) Strategic Risk Management - Capital Market Board Awareness on Data-driven cybersecurity and Intelligence Treats Assessment by The Securities and Exchange Commission of Thailand (SEC) - National Director Conference 2021 "Leadership behind Closed Door" by IOD
13) Mr. Auttapol Rerkpiboon	- Internal Lecture and Discussion Session on 2022 Pre-Strategy Review - Internal Lecture and Discussion Session on 2022 Strategy Review - Internal Lecture and Discussion Session on 2022 Strategic Retreat - Internal Lecture about GRC on the following topics: 1) Learning from the World Economic Forum 2021 2) Personal Data Protection Act, B.E. 2562 (PDPA) Implementation Plan 3) How organization's culture becomes anti-virus for organization? 4) Strategic Risk Management
14) Mr. Veerathai Santiprabhob	- Internal Lecture and Discussion Session on 2022 Pre-Strategy Review - Internal Lecture and Discussion Session on 2022 Strategy Review - Internal Lecture and Discussion Session on 2022 Strategic Retreat - Internal Lecture about GRC on the following topics: 1) Learning from the World Economic Forum 2021 2) Personal Data Protection Act, B.E. 2562 (PDPA) Implementation Plan 3) How organization's culture becomes anti-virus for organization? 4) Strategic Risk Management - Advanced Audit Committee Program by IOD - National Director Conference 2021 "Leadership behind Closed Door" by IOD - Special Lecture on Upstream Insight for PTTEP Executives: Navigating through Uncertainty: Upstream Transformation, Greener Pastures – Better Future, Corporate Strategies for Resilience & NOC's: What is the Path Forward? by IHS Markit
15) Mr. Montri Rawanchaikul	- Internal Lecture and Discussion Session on 2022 Pre-Strategy Rev - Internal Lecture and Discussion Session on 2022 Strategy Review - Internal Lecture and Discussion Session on 2022 Strategic Retreat - Internal Lecture about GRC on the following topics: 1) Strategic Risk Management - Special Lecture on Upstream Insight for PTTEP Executives: Navigating through Uncertainty: Upstream Transformation, Greener Pastures – Better Future, Corporate Strategies for Resilience & NOC's: What is the Path Forward? by IHS Markit

Currently, 12 of the Company's directors have participated in IOD's Director Certification Program (DCP), 4 have attended the IOD's Director Accreditation Program (DAP). Totally, there are 12 out of 15 directors (80%) who have attended the two mentioned programs. In addition, the Company regularly provided them with information on new and updated seminars and trainings. The details of the training courses attended by the directors are disclosed in Attachment 1: "Information of the Board of Directors, Management, Controlling Persons, and Corporate Secretary".

(4) Performance Appraisal of the Board

The Good Corporate Governance and Business Ethics of the PTTEP Group (CG&BE) stipulates that there should be an annual performance appraisal of the Board derived from Board Performance Target and Performance Appraisal Form. This allowed the Company's directors to review their performance, key issues, and obstacles which they had faced during the year as well as to enhance their directorship efficiency.

The 4 types of Board's performance appraisal are:

1) Individual self-appraisal and individual cross-appraisal by other directors, including four evaluation topics, namely (1) qualifications, (2) independence, (3) roles and responsibilities, and (4) training and self-development.

2) Appraisal of the entire Board, including 6 evaluation topics, namely (1) corporate policies and strategic planning, (2) Board performance, (3) management governance and cooperation, (4) Board meetings, (5) Board structure and qualifications, and (6) training and self-development.

3) Appraisal of the sub-committees, which includes questions on each of the sub-committee's performance, efficiency according to the roles and responsibilities stated in their charters.

4) Appraisal of the Chairman, which includes questions about the efficiency of the Chairman's performance, according to the roles and responsibilities of the Chairman as stated in the SEC's Corporate Governance Code for Listed Companies 2017 (CG Code) and the CG&BE of PTTEP Group under Section 6.3: Roles of the Board of Directors and Management. This includes topics, such as acting as the Chairman of the Board's meetings and the Annual General Shareholders' Meeting, setting agenda for the Board's meetings, and enhancing relationship between the Board and the management.

In 2021, Board Performance Target was established, covering three aspects, namely the building of the Company's stability, growth and appropriate return to the Shareholders, the PTTEP's Corporate Governance assessment results, and directors' meeting attendances and the efficiency of directors' performance. The performance appraisal form was also reviewed according to the SEC's CG Code. The 2021 performance appraisal form comprised four types of Board's performance appraisal with a scoring scale of 1 to 3 (1 = need improvement, 2 = meets standard, and 3 = good).

However, the Board of Directors and Management relationship appraisal questions were adjusted to cover more on their cooperation than relationship and the Corporate Governance. Also, the Sustainable Development Committee's appraisal questions were adjusted to reflect their broader duties and responsibilities on sustainable development.

Results of the 2021 Board performance appraisal can be summarized as follows:

1) Self-appraisal average score was 2.90, increased from 2.86 in 2020 (total score = 3). Individual cross-appraisal by other directors, the average score was 2.92, increased from 2.87 in 2020 (total score = 3).

2) Average scores from self-appraisal of the entire Board was 2.89, increased from 2.86 in 2020 (total score = 3).

In addition, the 2021 self-appraisal of the entire Board included an assessment part of the cooperation between the Board and management. The same set of questions was evaluated by management to further develop their relationships and cooperation and to promote two-way communication.

3) The 2021 appraisal scores of the four sub-committees were as follows:

3.1) Appraisal score of Audit Committee was 3.00, increased from 2.94 in 2020 (total score = 3).

3.2) Appraisal score of Nominating and Remuneration Committee was 2.98, increased from 2.86 in 2020 (total score = 3).

3.3) Appraisal score of Corporate Governance and Sustainable Development Committee was 2.65, decreased from 2.92 in 2020 (total score = 3).

3.4) Appraisal score of Risk Management Committee was 2.93, decreased from 2.95 in 2020 (total score = 3).

4) 2021 appraisal of the Chairman of the Board was 2.88, decreased from 2.94 in 2020 (total score = 3).

PTTEP reported scores to the Board for acknowledgment. Recommendations from the Board's appraisal will be used in the future for efficiency improvement of the Board, sub-committees, Chairman, and management in several aspects, such as focusing more on direction towards new business and sustainable development. The directors increase emphasis on self-development by attending applicable training and studying business trends and technologies from seminars, business visits, and exchanging knowledge with experts in other industries as well as holding the Directorship in other companies in order to enhance the Board's performance efficiency and initiation to further promote the Company's long-term sustainable growth.

(5) Performance Appraisal of the Chief Executive Officer (CEO)

The Board assigned the Nominating and Remuneration Committee to be responsible for conducting the CEO's performance appraisal according to the CEO's Performance Agreement as determined by the Committee. The appraisal was measured by the Corporate KPIs. The appraisal outcome must also be approved by the Board to ensure checks and balances as well as to allow the Company to monitor the performance of the CEO. In addition, it will help promote the Company's Good Corporate Governance and greater operational efficiency in the future.

8.1.2 Meeting Attendance and Individual Directors' Compensation

(1) The Board's Meetings

The Board's monthly meetings and agenda are scheduled and set in advance each year by the Board itself. There are 12 normal meetings annually held every Friday each month. The Board members have been informed of the 2022 meeting schedule since September 2021. Meetings related to the Company's strategic planning, to which the Board has greatly committed its time and priority, are commonly held off-site, whereas additional meetings will be held when deemed appropriate. In 2021, there were 19 Board meetings. The Board usually receives meeting invitations from the Company Secretary, along with agenda and important documents related to the meetings, for review at least 7 working days prior to the meeting date, except in those urgent cases with insufficient information. In addition, the meeting documents are delivered to the directors through dedicated software to facilitate and speed up their reviews as well as to promote a paperless process.

Generally, the Company's Chairman, the CEO, the Secretary to the Board of Directors, and the Company Secretary are responsible for agenda proposals for Board meetings; however, in practice, the Company's directors are also eligible to make

the proposals. The Board's meeting agenda items are clearly classified, including monthly items of performance review as well as budget execution.

During each of the meetings, which usually lasts approximately 3 - 4 hours, the Chairman allocates an adequate time to each agenda to provide an opportunity for directors to express their opinions independently. The Company's executives are also invited to attend the meetings to provide necessary information as well as to acknowledge the policies and issues being raised. The Secretary to the Board of Directors and the Company Secretary administer provide advice to the Board on related rules and regulations for proper practices, take minutes of the meetings, as well as keep complete filing of all the necessary meeting information and documents.

The Board's resolutions are based on a majority vote, where one director has one vote. Should a director have a stake in one of the issues, he or she will not be allowed to attend the meeting and/or to exercise his or her vote on that issue. In the circumstance where the voting is tied, the Chairman of the meeting is entitled to cast the decisive vote.

The issues which require an approval of no less than three-fourths of the total vote of the Company's eligible shareholders attending the meeting are as follows:

- 1) The sale or transfer of whole or important parts of business of the Company to other persons
- 2) The purchase or acceptance of transfer of businesses of other public limited companies or private companies to the Company
- 3) The making, amending, or concealing of contracts relating to the leasing out of the businesses of the Company, wholly or certain important parts, the assignment to any other persons to manage the businesses of the Company or the amalgamation of the businesses with other persons with objectives towards profit and loss sharing
- 4) To amend the Memorandum or Articles of Association
- 5) To increase or reduce the registered capital, issue debentures, amalgamate, and dissolve the Company
- 6) In case where the Company or one of the subsidiaries agrees to enter connected transactions, or disposition or acquisition of the Company's or the subsidiary's assets, as determined by the Securities and Exchange law and notifications in relation to such transaction

The minutes of the Board's meetings cover all significant matters. For issues seeking approval, all resolutions are unanimous. The names of the persons attending or absent from the meetings, the names of the meetings' attendants, board opinions, questions, management answers, or clarifications are recorded in detail, while the minutes are systematically filed and kept safely. All directors of the Board usually attend every meeting unless an absence is deemed necessary, in which case the director in question must provide the Board's Chairman with an application for leave, which must be communicated to all the Board members prior to the meeting and will be subsequently recorded in the report of individual directors' meeting attendance. In 2021, the majority of the Board members attended every meeting. The directors who were unable to attend the meeting informed the Chairman of the reasons in advance.

In 2021, non-executive directors held one meeting in the absence of the management. The purpose of the meeting was to discuss and clarify ongoing issues from corporate performance of 2021. The results were summarized for and acknowledged by the CEO for further consideration.

Meeting Attendance of PTTEP Directors in 2021

Director's Name	Board of Directors	Independent Directors Committee	Non-Executive Directors Committee	Corporate Governance and Sustainable Development Committee	Audit Committee	Nominating and Remuneration Committee	Risk Management Committee	Annual General Shareholders' Meeting 2021
	Total number of meetings	Total number of meetings	Total number of meetings	Total number of meetings	Total number of meetings	Total number of meetings	Total number of meetings	Total number of meetings
1. Mr. Krairit	19 Times	4 Times	1 Time	4 Times	14 Times	8 Times	13 Times	1 Time
2. Mr. Achporn	18/18	4/4	1/1	-	-	-	-	1/1
3. Admiral Tanarat	19/19	4/4	1/1	-	14/14	8/8	-	1/1
4. Lieutenant General Nimit Suwannarat	19/19	4/4	1/1	4/4	-	8/8	-	1/1
5. Mr. Pitipan	14/19	4/4	1/1	-	-	7/8	13/13	1/1
6. Mr. Bundhit	19/19	4/4	1/1	4/4	-	8/8	13/13	1/1
7. Ms. Panchun	19/19	4/4	0/1	-	-	8/8	-	1/1
8. Mr. Patchara	19/19	4/4	1/1	-	14/14	-	13/13	1/1
9. Mr. Dechapiwat	19/19	-	1/1	-	-	8/8	-	1/1
10. Mr. Atikom	13/19	3/4	0/1	-	8/14	-	-	1/1
11. Mrs. Angkarat	19/19	-	1/1	-	-	-	13/13	1/1
12. Mr. Auttapol	19/19	4/4	1/1	4/4	14/14	-	-	1/1
13. Mr. Veerathai	19/19	-	1/1	-	-	-	-	1/1
Santiprabhob	19/19	4/4	1/1	4/4	-	-	12/13	1/1

¹ Mr. Krairit Euchukanonchai was elected as a director in place of Mr. Praiya Phinyawat effective from February 1, 2021, and was elected as Chairman from February 15, 2021, and was elected as Chairman of the Independent Directors from May 21, 2021.

Director's Name	Board of Directors	Independent Directors Committee	Non-Executive Directors Committee	Corporate Governance and Sustainable Development Committee	Audit Committee	Nominating and Remuneration Committee	Risk Management Committee	Annual General Shareholders' Meeting 2021
	Total number of meetings	Total number of meetings	Total number of meetings	Total number of meetings	Total number of meetings	Total number of meetings	Total number of meetings	Total number of meetings
14. Mr. Wattanapong Kurovat ²	19 Times	4 Times	1 Time	4 Times	14 Times	8 Times	13 Times	1 Time
15. Mr. Montri Rawanchaikul ³	12/12	-	1/1	-	-	-	8/8	-
	5/5	-	-	-	-	-	-	-
Resignation of Former Directors during 2021								
1. Mr. Prajya Phinyawat ⁴	1/1	-	-	-	-	-	-	-
2. Mr. Twarath Sutabutr ⁵	7/7	-	-	-	-	-	4/4	1/1
3. Mr. Phongsthorn Thavisin ⁶	14/14	-	-	-	-	-	-	1/1

² Mr. Wattanapong Kurovat was elected as a director in place of Mr. Twarath Sutabutr and was elected as Risk Management Committee effective from May 1, 2021.

³ Mr. Montri Rawanchaikul was elected as Chief Executive Officer and Director effective from October 1, 2021.

⁴ Mr. Prajya Phinyawat ends his PTTEP Directorship and Chairmanship due to age of 70 effective from February 1, 2021.

⁵ Mr. Twarath Sutabutr resigned from directorship effective from May 1, 2021.

⁶ Mr. Phongsthorn Thavisin retires from his term of being CEO and Director, effective from September 30, 2021.

Number of PTTEP Shares held by the Directors, their Spouses/Cohabiting Couple and Minor Children
as of December 31, 2021

Director's Name		Number of Ordinary Shares		
		As of December 31, 2020	As of December 31, 2021	Increase/(Decrease) during the Year
1.	Mr. Krairit Euchukanonchai ¹	N/A	-	-
2.	Mr. Achporn Charuchinda	-	-	-
3.	Admiral Tanarat Ubol	-	-	-
4.	Lieutenant General Nimit Suwannarat	-	-	-
5.	Mr. Pitipan Tepartimargorn	-	-	-
6.	Mr. Bundhit Eua-arporn	-	-	-
	Spouse/Cohabiting Couple	4,587	4,587	-
7.	Ms. Penchun Jarikasem	10,000	-	10,000
8.	Mr. Patchara Anuntasilpa	-	-	-
9.	Mr. Dechapiwat Na Songkhla	-	-	-
10.	Mr. Atikom Terbsiri	-	-	-
11.	Mrs. Angkarat Priebjrivat	-	-	-
12.	Mr. Auttapol Rerkpiboon	-	-	-
	Spouse/Cohabiting Couple	500	500	-
13.	Mr. Veerathai Santiprabhob	-	-	-
14.	Mr. Wattanapong Kurovat ²	N/A	-	-
15.	Mr. Montri Rawanchaikul ³	52,050	52,050	-
	Spouse/Cohabiting Couple	8,900	8,900	-

¹ Mr. Krairit Euchukanonchai was elected as a director in place of Mr. Prajya Phinyawat, effective from February 1, 2021, and was appointed as Chairman of the Board of Directors effective from February 15, 2021.

² Mr. Wattanapong Kurovat was elected as a director and member of the Risk Management Committee in place of Mr. Twarath Sutabutr, effective from May 1, 2021.

³ Mr. Montri Rawanchaikul was elected as a director effective from September 8, 2021 and was appointed as Chief Executive Officer in place of Mr. Phongstorn Thavisin, effective from October 1, 2021. The number of ordinary shares above is as of the effective date.

Director's Name	Number of Ordinary Shares		
	As of December 31, 2020	As of December 31, 2021	Increase/(Decrease) during the Year
Former Directors Resigning during 2021			
1. Mr. Prajya Phinyawat ¹	15,000	15,000	-
2. Mr. Twarath Sutabutr ²	-	-	-
3. Mr. Phongsthorn Thavisin ³	101,037	101,037	-

(2) Remuneration of the Board and Members of the Sub-Committees

PTTEP has a sound and transparent policy in regard to remuneration of the Company's directors of the Board and sub-committees. The Nominating and Remuneration Committee, who is responsible for the policy, reviews the remuneration with prudence by taking into consideration remuneration of listed and comparable companies in the industry, performance of PTTEP, duties and responsibilities of the directors, overall economic situation, and the shareholders' opinions. The 2021 Annual General Shareholders' Meeting (AGM) approved the following remunerations for members of the Board and sub-committees, as proposed by the Nominating and Remuneration Committee.

Remuneration Rates for Members of the Board

- 1) Monthly allowance of THB 40,000 per person per month in a full-month payment
- 2) Meeting allowance of THB 50,000 per person per a meeting attendance
- 3) Bonus for the Board if there is a dividend in that year, totaling 0.2% of the Company's consolidated net profit in that year, but no more than THB 60 million per year.
- 4) 25% increase in all of the above for the Chairman

Remuneration Rates for Members of the Sub-Committees

The Company's sub-committees received the following remuneration:

- 1 Meeting allowance of THB 45,000 per person per a meeting attendance
- 2) 25% increase for the sub-committee's Chairman

Other Remuneration for PTTEP Directors

- None -

¹ Mr. Prajya Phinyawat ends his PTTEP Directorship and Chairmanship due to age of 70, effective from February 1, 2021. The number of ordinary shares above is as of the effective date.

² Mr. Twarath Sutabutr resigned from PTTEP Directorship effective from May 1, 2021. The number of ordinary shares above is as of effective date.

³ Mr. Phongsthorn Thavisin retires from his term of being CEO and Director, effective from 1 September 30, 2021. The number of ordinary shares above is as of the effective date.

Remuneration of Members of the Board and Sub-Committees in 2021

Director's Name	Remuneration							
	Board of Directors		Audit Committee	Corporate Governance and Sustainable Development Committee	Nominating and Remuneration Committee	Risk Management Committee	2021 Bonus Paid in 2022	Total
	Monthly Allowance	Meeting Allowance	Meeting Allowance	Meeting Allowance	Meeting Allowance	Meeting Allowance		
1. Mr. Krairit Euchukanonchai	550,000	1,125,000	-	-	-	-	4,500,337	6,175,337
2. Mr. Achporn Charuchinda	480,000	950,000	787,500	-	-	-	3,934,426	6,511,926
3. Admiral Tanarat Ubol	480,000	950,000	-	225,000	360,000	-	3,934,426	5,949,426
4. Lieutenant General Nimit Suwannarat	480,000	700,000	-	-	315,000	585,000	3,934,426	6,014,426
5. Mr. Pitipan Teparitimargorn	480,000	950,000	-	180,000	360,000	585,000	3,934,426	6,489,426
6. Mr. Bundhit Eua-arporn	480,000	950,000	-	-	450,000	-	3,934,426	5,814,426
7. Ms. Penchun Jarikasem	480,000	950,000	585,000	-	-	731,250	3,934,426	6,680,676
8. Mr. Patchara Anuntasilpa	480,000	950,000	-	-	360,000	-	3,934,426	5,724,426
9. Mr. Dechapiwat Na Songkhla	480,000	650,000	360,000	-	-	-	3,934,426	5,424,426
10. Mr. Atikom Terbsiri	480,000	950,000	-	-	-	585,000	3,934,426	5,949,426
11. Mrs. Angkarat Priebrivat	480,000	950,000	630,000	180,000	-	-	3,934,426	6,174,426
12. Mr. Autapol Rerkpiboon	480,000	950,000	-	-	-	-	3,934,426	5,364,426
13. Mr. Veerathai Santiprabhob	480,000	950,000	-	180,000	-	540,000	3,934,426	6,084,426
14. Mr. Wattanapong Kurovat	320,000	600,000	-	-	-	405,000	2,640,916	3,965,916
15. Mr. Montri Rawanchaikul	120,000	250,000	-	-	-	-	991,691	1,361,691
Former Directors Resigning during 2021								
1. Mr. Praiya Phinyawat	50,000	62,500	-	-	-	-	417,696	530,196
2. Mr. Twarath Sutabutr	160,000	350,000	-	-	-	180,000	1,293,510	1,983,510
3. Mr. Phongsthorn Thavisin	360,000	700,000	-	-	-	-	2,942,735	4,002,735
TOTAL	7,320,000	13,937,500	2,362,500	765,000	2,205,000	3,611,250	60,000,000	90,201,250

Remarks:

- 2021 Directors' Bonus to be proposed for approval from the Annual General Meeting of Shareholders for the year 2022 at the rate of 0.2% of the Company's net profit from the 2021 consolidated financial statements of the Company to be approved by the shareholders in 2022. If paid Dividend to shareholders, the payment will be made according to the term of service as the director and the chairman of the board receive a 25% higher bonus, but no more than THB 60 million per year.
- PTTEP provides the Chairman with a corporate car to carry out corporate-related purposes while in the chairmanship.

8.1.3 Corporate Governance Concerning Subsidiaries and Associated Companies

Details are disclosed in the “Structure and Business Operations” section, under the “Operational Policy of the PTTEP Group” topic.

8.1.4 Monitoring of the Compliance with Corporate Governance Policies and Practices

(1) Conflict of Interest Prevention Policy

PTTEP is committed to preventing all potential conflicts of interest to give the Company’s stakeholders’ confidence that our business management is efficient, transparent, and in compliance with the Good Corporate Governance and Business Ethics of PTTEP Group under the following principles:

- 1) Directors, management, and employees shall treat the interests of the PTTEP Group as priority and shall not participate or be involved in all activities which may lead to any conflicts of interest.
- 2) Directors, management, and employees shall self-review and disclose, at least on an annual basis, their transactions that have led to a conflict of interest with the Company.
- 3) Directors, management, and employees who have conflict of interest shall not participate in considering or voting on any matters in which they have vested interest, and such conflict of interest shall be completely disclosed to the Company.
- 4) Directors, management, and employees shall strictly adhere to the laws and regulations as required by the Stock Exchange of Thailand, particularly in relation to connected transactions.

The Company has established conflict of interest preventive measures as follows:

- 1) Directors, management, employees, and related persons must avoid financial involvement or engagement in a relationship with outsiders which may result in the PTTEP Group’s loss of benefits, conflicts of interest, or operational inefficiency.
- 2) Directors, management, employees who may have a potential conflict of interest on bidding, selection process, and awarding of the transaction, must report to their supervisors or those participating in the given process through conflict of interest electronics reporting system. They must also withdraw themselves from participating in such process or conflicted transactions of PTTEP.
- 3) Directors, management, and employees shall report to the Company through conflict of interest electronics reporting system regarding the information of persons having close relations and working within the PTTEP Group and the company in which PTTEP has invested. This is to prevent potential conflict of interest which may arise.
- 4) Directors, management, and employees must notify the Company immediately should there be any suspicion or the uncertainty of what they or their related persons are involved in, or that their shares in the business with transactions with the Company, may lead to a conflict of interest.

Directors, management, and employees must self-review their conflicts of interest on an annual basis. To review their conflicts of interest related to any particular matter in the procurement process, management and employees who are directly involved in the procurement process must self-review and disclose their transactions which may lead to a conflict of interest at least every 6 months. Such declaration will enable the supervisors to consider a re-assignment of duty of management, employees who have a conflict of interest to prevent such conflicts of interest from occurring.

(2) Prevention of Insider Trading

Details are disclosed in the “Corporate Governance” section, under the “Prevention of Insider Trading” topic.

(3) Anti-Corruption

Importance

The PTTEP's Board places importance on operating with transparency and fairness under corporate governance with zero tolerance on any form of corruption whether directly or indirectly. PTTEP has proper governance on all relevant functions pursuant to the Good Corporate Governance and Business Ethics of PTTEP Group or CG&BE which is the PTTEP Group's regulations binding all across the organization, from the directors, management, to all employees of PTTEP and its subsidiaries, who are required to sign a commitment form agreeing to observe and conform with such regulations. Also, our measures encourage those related to the PTTEP Group, including suppliers and joint-venture partners, to abide by the CG&BE and uphold similar best practices for anti-corruption at the same level with PTTEP's standards.

PTTEP believes that efficient anti-corruption measures require a sound governance structure together with a clear management system, adequate and proper risk management and internal controls, good monitoring for strict and ongoing compliance, independent audit and explicit guidelines as stated in the CG&BE. It also requires all directors and management to lead on good governance (CG Leader). The PTTEP Board of Directors assigned the Corporate Governance and Sustainable Development Committee to monitor compliance of the CG&BE as well as the Anti-Corruption Policy. Corporate Governance and Shareholder Engagement Section, under the Corporate Governance, Compliance, and Internal Control Department, Corporate Secretary Division, are a central function to support and drive the compliance of the CG&BE and PTTEP Group's anti-corruption measures. At least every quarter, updates are to be provided to the Corporate Governance and Sustainable Development Committee and the Board of Directors. The CG&BE has been prepared in writing under the internal control principles and published and distributed to all relevant stakeholders in Thai, English, and Burmese, as well as distribution the full version of the CG&BE on the Company's website for further study by interested parties' downloading. Finally, a “Standard of Practice for Anti-Corruption” was rolled out for the management and employees to conduct themselves properly under various circumstances where corruption risks exist – another internal control measure of PTTEP.

In addition, to establish a good standard for transparent business execution and reduce the risk of conflicts of interest, the PTTEP Group constantly adheres to the No Gift Policy and explicitly announces the Policy to outsiders that the PTTEP Group personnel will not accept gifts, entertainment, or any other benefit on any occasion. Integrity & Ethics has also been made as one of the corporate values for cultivation across the organization.

Scope of the PTTEP Group's Anti-Corruption Policy

PTTEP specifies that the CG&BE represents the PTTEP Group's anti-corruption policy. Its contents embrace the principles, guidelines, and clear examples of all matters related to anti-corruption measures. These include governance structure stated under Corporate Governance; guidelines for conflicts of interest, procurement and contract; anti-money laundering; political neutrality; use and protection of information and assets; and specific guidelines for anti-corruption practices under Business Ethics. The CG&BE is clearly imposed on the directors, management, and employees of PTTEP and its subsidiaries, as well as their business partners, all of whom agreed in writing to comply with the CG&BE and encourage joint-venture partners to adapt suitable corporate governance and suitable business ethics.

their business partners, all of whom agreed in writing to comply with the CG&BE and encourage joint-venture partners to adapt suitable corporate governance and suitable business ethics.

PTTEP defined corruption based on applicable rules and legislation, domestic and international. It focuses on intention as a prime consideration: any given action for in the interests of the PTTEP Group must not accompany with intention to use one's or others' authority for wrongful gain, which is unlawful and/or against the PTTEP Group's regulations. This also includes all corrupt practices undertaken as a giver or recipient, or through an agent. PTTEP recognizes that certain activities, including not-for-profit donation, sponsorship, and facilitation payment, pose vulnerability for corruption. Therefore, in defining "corruption", these activities are mentioned so that practitioners may exercise extra precaution. PTTEP also provides appropriate guidelines for employees when facing such situations in the Standard of Practices for Anti-Corruption to reduce corruption risks. In addition, PTTEP does not make donations to support political parties for election campaigns, both at the local and national levels, which is in line with guideline and the principle of political neutrality under our business ethics.

Measures and Principles for Implementation

Implementation of anti-corruption measures involves an internal control system, risk management, compliance oversight, audit, and promotion of corporate culture and ethics, each of which is under the responsibility of relevant functional units. Therefore, PTTEP defined the "Three Lines Model" of internal control and risk management as follows:

1) The First Line Roles are made up of various functional units responsible for overseeing their respective work while they apply proper risk management, internal control, and full compliance with all applicable laws and regulations. The people in this First Line Roles are required to have knowledge and understanding of internal regulations and relevant laws related to their works. Moreover, they must improve their competencies and attend the necessary trainings to ensure that they are adequately knowledgeable and ready to perform duties in their respective jobs and efficiently confront various situations.

2) The Second Line Roles are made up of those units responsible for overall legislation, regulations, and policies adopted by the Company and for defining regulations and criteria as well as monitoring the compliance. For instance, the units in charge of governance, risk management, internal control, and compliance (GRC) come under the Human Resources, Corporate Affairs, and Assurance Group. There is a proactive and explicit integration of management as stated in the Governance, Risk Management, and Compliance Management System Manual (GRC MS Manual) to enable goal achievement while having proper risk management according to applicable corporate regulations and code of ethics. At the same time, business processes are improved for efficiency and adequate internal control through reduced redundancy. The work scope contains the following 9 key components: (1) leadership and commitment; (2) policies, objectives, and plans; (3) organization and resources; (4) GRC assessments; (5) controls and responses; (6) monitoring and assurance; (7) audit; (8) continual improvement; and (9) communication and culture.

3) The Third Line Roles are made up of audit functional unit and external auditors, responsible for independently auditing the overall performance of various management systems under the First and Second Line Roles.

PTTEP requires the Internal Control Section to regularly conducts internal control assessment on potential fraud risks, which include risks of asset misappropriation, corruption, fraud, and fraudulent financial reporting, to evaluate and ensure the adequacy of the Company's internal control system in accordance with the Office of the Securities and Exchange Commission (SEC)'s regulations. The Company's Vice Presidents, from each of the functional groups, are required to do self-assessment of fraud risks considering 3 main factors, namely, motivation/pressure, opportunity to fraud, and

attitude/necessity to fraud. The results of the Assessment indicated that PTTEP has an adequate and appropriate level of internal control. The majority of the function groups have carefully assessed taking into consideration these 3 factors and appropriately adjusted their internal control measures in time.

Continuous Communication and Knowledge Development and Training

The Corporate Governance and Sustainable Development Committee has defined a clear plan for cultivating the CG&BE of the PTTEP Group and the Anti-Corruption Policy for everyone across the organization through various ongoing activities encompassing target groups at all levels and of all age groups. Activities were designed to match target groups' interests and knowledge levels, and their implementation expanded to external stakeholders, including suppliers. Performance indicators of target groups inside and outside PTTEP were clearly defined to ensure proper policy implementation for the most concrete results. This year 2021 relevant actions included the following:

Measures for Internal Parties

1) Organized induction sessions for new directors, management, and employees regarding the governance, risk management, and compliance (GRC) providing them with basic knowledge and understanding for acknowledgment and compliance.

2) Organized GRC promotion for the Board. The topics of 2021 were as follows:

- Learning from the World Economic Forum 2021
- A brief of preparation to comply with Personal Data Protection Act, B.E. 2562
- How organization's culture becomes anti-virus for organization?
- Strategic Risk Management

3) Organized GRC basic knowledge training courses (GRC 101) for staff who worked with the Company for 2-3 years. Contents cover corporate governance and business ethics, risk management, internal control, and compliance, with an emphasis on anti-corruption and relevant matters so that employees have correct understanding and duly apply them to their work.

4) Arranged training courses for supervisor level up regarding Good Corporate Governance and Business Ethics (CG&BE) under the concept of "CG&BE Train the Trainer". The objectives are to build ethical leadership with an understanding on CG&BE, be a role model, enable to advise and promote their subordinates to be aware and conduct their work ethically.

5) Jointly organized the PTT Group CG Day 2021, an annual activity of the PTT Group's flagship companies for all personnel of the PTT Group and representatives of entities dealing with governance and anti-corruption, suppliers, and customers of the PTT Group. Known this year as "PTT Group CG Day 2021: The Power of Business Integrity", the activity was held on December 22, 2021, as a virtual event to adapt to the COVID-19 pandemic. This event clearly demonstrated the unity and commitment among the PTT Group companies in carrying out businesses with correct and transparent manners, and free from all types of corruption.

6) Established communication on conflicts of interest, guidance on giving and acceptance of gifts, corporate tokens, representation, or other benefits which may be computed into a monetary value, and the complaint handling together

with the provision on protection so that management and employees may recognize an importance of corruption prevention measures and confidently file complaints through the Company's defined channels with a good understanding of relevant procedures and protection. The number of complaints were disclosed annually as a summary along with punished cases. (Details are shown under the "Whistleblowing Reporting and Protection Procedures" topic) This is part of the campaign for all to be part in building corporate culture with transparency and corruption-free practices.

7) Instituted other ongoing communications to educate across the organization such as CEO Message regarding No Gift Policy, encouraging employees to participate in various anti-corruption activities e.g. promoting Anti-Corruption Day and International Anti-Corruption Day through multiple channels, such as communication signboards, e-mails, and newsletter, etc.

Measures for External Parties

PTTEP has a clear intention to become a leading company in the realm of Corporate Governance (CG) demonstrating strong commitment and expanding good governance to external parties. This is evidenced by PTTEP having a written clear policy covering external stakeholders, for example, vendors, joint venture partners, and representatives of the PTTEP Group. The Company also encourages these external stakeholders to conduct businesses ethically and not to be involved with corruption through the following activities:

1) Notifying all suppliers about the No Gift Policy and request for their cooperation not to give or offer gifts, souvenirs, or other benefits on any occasions to the directors, management, and employees of the PTTEP Group. PTTEP also communicated and invited suppliers with the top 100 contract values to engage in online training (including post-test) on anti-corrupt practices. A total of 93 percent in actual attendance successfully passed the test.

2) Announcing to external parties the No Gift Policy explicitly on PTTEP's website and installing communicating signboards in office premises near spots where visitors can clearly see, both in Thailand and other countries.

3) Advocating to society a culture of good governance and anti-corruption. This year 2021 PTTEP took actions and participated in various key activities. Details are shown under the "Collective Efforts with the Public to Counter Corruption" topic.

4) Establishing channels for external parties to inquire in case of questions or recommendations on good corporate governance and business ethics by emailing to Corporate Secretary Division (corporatesecretary@pttep.com)

Monitoring the Implementation of Anti-Corruption Measures

The Board of Directors has assigned the Corporate Governance and Sustainable Development Committee to monitor implementation concerning anti-corruption measures, which is part of the CG&BE. The Company Secretary, as this Committee's Secretary, gathers such outcomes and reports to the Committee at least quarterly. Besides, since the oversight of compliance with anti-corruption measures of the PTTEP Group is jointly done by several functional units (Second Line Roles and Third Line Roles), reports are made to the applicable sub-committees, namely the Risk Management Committee and the Audit Committee. All implementation results are reported to the Board of Directors and summarized for the Shareholders in the Annual Report.

Furthermore, the Corporate Governance and Sustainable Development Committee monitors the outcomes of the CG&BE plan annually and assesses such outcomes against relevant KPIs to ensure goal achievement.

Audit

PTTEP designates the Internal Audit Division to perform fraud auditing tasks, which include corruption, and undertaking further examination when complaints are received. Currently, the Internal Audit Division has an Internal Audit Guideline – Fraud Audit that covers fraud risk assessment, prevention, detection and investigation of fraud, as well as practical guidelines used in the investigation process for complaints of fraud.

PTTEP has implemented its Continuous Control Monitoring System to monitor and inspect any irregular transactions that occur in PTTEP's work processes. The system has been implemented on the Procure to Pay process, and covered warehousing and inventory management, targeting the risk of non-compliance with regulations or work procedures that may possibly lead to fraud and corruption. When an irregular transaction has been detected, the system will send a notice directly to management, enabling them to investigate and promptly resolve the matter. Moreover, in 2021, there were more initiatives to apply technology to prevent corruption, for example, developing GRC One Assurance Digital Report which will enable management to receive GRC information timely and support their important decision making, developing AI to analyze Audit Finding Database in order to predict behaviors and prevent corruptions, and implementing Robotic Process Automation (RPA) to reduce accounting errors.

Collective Efforts with the Public to Counter Corruption

PTTEP acknowledges the significance of our role as a listed company to build confidence of our shareholders and stakeholders that the Company's management is transparent, fair, and free from fraud and corruption. The Company as one of the State Enterprises has a responsibility to lead by example and to encourage society to adapt better anti-corruption standards. In 2021, the Company proactively took several measures and participated in several activities to counter corruption. For instance, Thailand's National Anti-Corruption Day which was on September 6, 2021, and International Anti-Corruption Day (Thailand) which was on December 9, 2021, both of which are online activities.

The Private Sector Collective Action Against Corruption (CAC) certified PTTEP as a member of Thailand's CAC consecutively for the third time in the official certification announcement arranged in the 4th quarter of 2020. PTTEP has dedicated to improving and strengthening corruption prevention in our operation continuously. This Certification confirms our commitment to operate with transparency and further build trust for our stakeholders.

4) Whistleblowing Reporting and Protection Procedures

PTTEP's Board of Directors has established the Reporting and Whistleblowing Regulation for the PTTEP Group to ensure that the complaint-handling process is effective, transparent, fair, and comparable to international standards. This Regulation is meant to provide appropriate and fair protection for whistleblowers and those cooperating with the Company in good faith. This mechanism gives an opportunity for both internal and external parties of the organization to report any suspicious misconduct or wrongdoing that might be in violation of laws, the Good Corporate Governance and Business Ethics (CG&BE), anti-corruption policies, and other related regulations, as committed by the Board, management, employees, or representatives of the PTTEP Group.

PTTEP sets clear procedures and timeframe for investigation of complaints as prescribed in the Regulation to ensure the transparency and fairness of the complaint-handling process. The examples are as follows:

- The Corporate Governance Section, Corporate Secretary Division, as a case coordinator according to the Reporting and Whistleblowing Regulation, and a subsidiary case coordinator preliminary evaluates the information and adequacy of the evidence before forwarding the complaint to the Company's investigator within 7 working days.

- The investigators prescribed in the Regulation must complete the investigation within 30 working days. If the period is extended due to necessity, the extension can be made only with the approval of the authorized person (not more than 7 working days at a time for non-complex cases and not more than 30 working days at a time for complex cases). The investigator shall not have vested interests in the complaint. Every complaint coming through the whistleblowing channels is summarized and reported to the Corporate Governance and Sustainable Development Committee and/or Audit Committee (as the case may be), and subsequently reported to the Company's Board of Directors.

The whistleblowing channels of the PTTEP Group are as follows:

1) Send mail to PTTEP director, supervisor, or the Corporate Governance Section, Corporate Secretary Division:

PTT Exploration and Production Plc.
555/1 Energy Complex Building A, 33rd Floor,
Vibhavadi Rangsit Road, Chatuchak, Bangkok 10900

2) Send e-mail to the supervisor or the Corporate Governance Section, Corporate Secretary Division (cg hotline@pttep.com)

3) Report through the whistleblowing system, which is available on PTTEP's website (www.pttep.com). The system will assign an individual Report Number and PIN to the whistleblowers to ensure security and prevent forbidden access by unauthorized personnel, as well as to allow the whistleblowers to perform a follow-up on the progress of the reported complaint and make inquiries. This system serves as a necessary tool for preventing and monitoring the risks of corruption.

There is also a formulation of the protection of whistleblowers and involved persons including the remedy for any person who is affected by the complaint in this Regulation. Whistleblowers and those cooperating with the Company in good faith shall receive appropriate and fair protection from the PTTEP Group, such as no change of job positions/titles, no threat or unfair treatment, etc. The Complaint investigation shall be conducted on a confidential basis and not disclosed to irrelevant persons.

In 2021, PTTEP received a total of 20 complaints through the channels according to the Whistleblowing Regulation and Human Resources Management Policy. After a preliminary review on the clarity and adequacy of these complaints, 10 cases were accepted for further investigation. As of December 31, 2021, the investigation of 9 cases were completed while 1 case is under investigation process (Completed in Quarter 1/2022). A summary of complaints is shown in the table below.

Topic	2019	2020	2021
Number of whistleblowing cases	7	10	20
Whistleblower			
• External reporter	2	1	8
• Internal reporter	2	4	4
• Anonymous reporter	3	5	8
Number of accepted cases after considering evidence and witnesses	3	5	10
Number of wrongdoing cases	1	2	3

Topic	2019	2020	2021
Type of wrongdoings			
• Health and safety	-	-	-
• Business integrity			
- Non-compliance with regulation	-	-	-
- Conflict of Interest	-	1	-
- Corruption, Fraud, Bribery	-	-	-
- Use of asset and information	-	-	1
- Others	-	-	-
• Human Resources			
- Inappropriate manner	1	1	-
- Sexual harassment	-	-	2
- Non-sexual harassment	-	-	-
- others	-	-	-
• Others	-	-	-
Consequences of wrongdoings			
• Verbal Warning	-	1	-
• Written Warning	-	-	3
• Suspension	-	-	-
• Termination with severance pay	-	-	-
• Termination without severance pay	1	1	-

After completing the investigation of these 9 accepted cases pursuant to the Regulation, there were 6 cases that no offenses have been found while there were 3 cases of wrongdoing. The details are as follows:

1) One case was related to the use and protection of information and assets which has been considered a disciplinary offense pursuant to the Good Corporate Governance and Business Ethics Regulation. PTTEP has given a written warning to the offender.

2) Two cases were related to inappropriate behavior of staff (sexual harassment) which has been considered a disciplinary offense pursuant to the Human Resources Management Policy and Business Ethics on Human Resources. PTTEP has given written warnings to the offenders.

The Corporate Governance Section prepared and reported the results of the complaint investigation to related parties. The findings of the cases were used to carry out further improvements to the Company's internal control measures.

For more details of the Reporting and Whistleblowing Regulation and Whistleblowing System, please visit PTTEP website at <https://www.pttep.com/en/Aboutpttep/Corporategovernance/ReportingAndwhistleblowingregulations.aspx>

8.2 The Audit Committee Report

PTTEP is determined to conduct our E&P business with a long-term strategy to achieve sustainable growth, under our vision of “Energy Partner of Choice” to operate globally for reliable energy supply and sustainable value to all stakeholders by emphasizing the importance of fair and good corporate governance as well as benefits for the shareholders and stakeholders. The Audit Committee and the Internal Audit Division, in line with this direction, are appointed by the Board to govern, oversee and review the Company’s processes and their conformity to the Good Corporate Governance and Anti-Corruption policy, ensure that the Governance, Risk management, and Compliance (GRC) management remains effective in the rapidly changing business environment as well as closely monitor the Company’s work processes and goals as we strive towards a sustainable future.

The Audit Committee consisted of 4 independent directors. Mr. Achporn Charuchinda was the Chairman of the Audit Committee. Mr. Dechapiwat Na Songkhla, Mrs. Angkarat Priebjriwat and Ms. Penchun Jarikasem were members of the Audit Committee. All directors had sufficient knowledge and experiences to review the accuracy and reliability of the financial statements.

In 2021, The Audit Committee Meetings were held 14 times including a co-meeting with the Risk Management Committee. The details of individual directors’ attendance were disclosed in the 56-1 One Report 2021 in the “Summary of Board’s Performance in the Past Year” section, under the “Meeting Attendance of PTTEP Directors in 2021” topic.

The Audit Committee also had meetings with the management, the Company’s internal and external auditors to discuss related matters and gave beneficial recommendations to PTTEP. In addition, there was the meeting with the Risk Management Committee to share information to ensure that their duties on monitoring the Company’s activities were appropriately performed against dynamic risks. In 2021, the Committee’s activities according to the Audit Committee Charter were summarized as follows:

1) Review of Financial Reports

The Committee reviewed the Company’s quarterly and annual financial statements together with the management and the external auditors from PricewaterhouseCoopers ABAS Limited (PwC) attended all meetings. The review is to ensure that the Company’s accounting system and the statements are accurate and reliable, the statements disclosed complete, sufficient, and timely information and complied with all relevant laws and regulations as well as generally accepted accounting standards. The Committee also provided recommendations in regard to the Company’s Management’s Discussion and Analysis (MD&A) to cover an analysis of the relevant factors affecting the Company’s operation and financial statements.

2) Review of the Internal Control System

The Committee reviewed and endorsed the assessment results of the Company’s internal control system including an assessment questionnaire required by the Securities and Exchange Commission of Thailand (SEC), which found that the Company had a proper internal control system. This included internal control related to financial objectives and processes with high fraud risk. The Company also improved internal control continuously to align with its operations and relevant laws and regulations as well as had sufficient controls on subsidiaries. The Committee promoted a proactive approach in internal auditing

while taking into account the key risks and crucial lessons learned, and also continued to encourage a continuous implementation of the preventive controls which helped to prevent or reduce the business risks which may have an unfavorable impact on the Company.

3) Review of Connected Transactions or Transactions with Potential Conflicts of Interest

The Committee reviewed the connected transactions or transactions with potential conflicts of interest prior to the Board's consideration to ensure that they were reasonable and beneficial to the Company. For most connected transactions with the parent company, the joint venture companies which are third parties have reviewed the conditions of the transactions in order to safeguard the benefits of minority shareholders. The Committee also reviewed the disclosure of the transactions in the annual report and viewed that the transactions were correctly and completely disclosed as well as the prices and conditions were fair. Moreover, the transactions were appropriately approved by the management or the Board of Directors prior to their commencement.

4) Review of Compliance with related Laws and Regulations

The Committee reviewed the PTTEP Group's compliance with the Securities and Exchange laws, SET's Regulations, and/or other related laws, both Thai laws and the laws of other countries in which the PTTEP Group operates or invests. The Committee also recommended the management to ensure compliance with laws and regulations of new processes or process improvement such as Centralized Inventory Transformation Project. Moreover, the Committee acknowledged the compliance report prepared by Compliance Function, in addition to the audit results related to compliance with related laws and regulations which is reported by the Internal Audit Division. The Committee also followed up on the progress of relevant action plans.

5) Oversight of Internal Audit Activities

The Committee reviewed and approved annual audit plan, long-term audit plan, and audit results as well as followed up on the progress of action plans in response to audit findings. The Committee also reviewed the performance against the audit plan, the independence of auditors, key performance indicators of the Internal Audit Division, and assessed the performance of Head of the Internal Audit Division. Moreover, the Committee reviewed the Audit Committee Charter and Audit Charter on an annual basis.

The Committee gave precedence to digital technologies and promoted the adoption of it in the audit process. This enabled audit work to adapt to transformation in the digital era, additionally, supported audit work to be more accurate, complete, and efficient as well as better analysis which led to precise and timely problem-solving. The example was the implementation of the Continuous Control Monitoring System on Procure to Pay Process and Warehouse and Inventory Management Process. Moreover, in 2021, the Internal Audit Division enhanced the Audit Management System (TeamMate+) which automatically and efficiently generates reports leading to faster and more reliable report analysis.

The Committee also promoted personal development of internal audit staff especially training in digital technologies to adopt in audit work and ensure that internal audit activities are appropriate and effective.

6) Nomination of/Meeting with the External Auditor

For the appointment of the external auditor for 2021, the State Audit Office of the Kingdom of Thailand (SAO) requested the Company to outsource the external auditor in accordance with the State Fiscal and Financial Disciplines Act, B.E. 2561 (2018), Section 71, requiring the SAO or the external auditor endorsed by the SAO to audit the financial reports of the government agency. The Company then proposed Ms. Amornrat Pearmpoonvatanasuk, Certified Public Accountant Registration No. 4599 or Mr. Boonrueng Lerdwiseswit, Certified Public Accountant Registration No. 6552, the auditors from PricewaterhouseCoopers ABAS Limited (PwC), to serve as the Company's external auditor. The Committee considered that PwC is a leading company with reliable performance and independence; furthermore, the audit fee is reasonable compared to other companies in the same business. Therefore, the Committee agreed to propose PwC to be the Company's external auditor. The SAO subsequently endorsed PwC as PTTEP's external auditor. In addition, the Committee met with the external auditor to acknowledge the audit plan and observations as well as key audit matters in the auditor's report, and also met separately with the external auditor in the absence of the management to acknowledge additional opinions from the auditor.

The Committee also assigned the management to set criteria of obtaining approval from the Committee for significant non-audit services transactions engaging the company and its affiliated which the external auditors worked for. This is to ensure the external auditor's independence. Additionally, the Committee had an opinion on clear disclosure of non-audit fee in the annual report so that shareholders can obtain the information.

7) Oversight of Fraud Prevention

The Committee encouraged the improvement of the Company's internal control system to ensure optimal control over fraud prevention. For example, the Committee promoted procurement through a competitive bidding process and supported the use of analysis of past procurement reports for preparing annual procurement plans in advance. As a result, the proportion of bidding transactions is continuously higher than direct negotiation transactions every year. The Committee also encouraged staff whistleblowing, which allowed a person to raise a suspicious misconduct or a potential fraud. In addition, the Committee was responsible for verifying the results of the Company's self-assessment relating to the anti-corruption process required by CAC and the Corporate Governance Code for Listed Companies (2017). The Company is also a certified member of Thai Private Sector Collective Action against Corruption (CAC), reflecting our determination to stand strongly and prominently against corrupt practices.

In conclusion, in 2021, the Committee conducted its work thoroughly, methodically, and strictly according to the Audit Committee Charter and reported the results of all meetings to the Board on a regular basis. The committee provided opinions and recommendations that enhanced the Company's good corporate governance. This approach ensures that the Company is able to deliver the best possible performance in comparison with our industrial peers.

In addition, the Committee is confident in the competency of the Internal Audit Division, which consists of personnel with various qualifications, skills and experiences, enabling them to perform their duties in auditing to cover various aspects efficiently.

The Committee's overall opinion regarding the work in 2021 is that the Company's financial reports were accurate, in compliance with generally accepted accounting standards and with International Financial Reporting Standards. The Company also conducted the operations in compliance with the relevant laws and obligations. In addition, the Company has proper risk management, fraud risk management, internal controls, internal audit, and corporate governance.

The Committee's performance was graded "Very Good" by themselves, the Board of Directors, and related agencies.

(Signed) *Achporn Charuchinda*

(Mr. Achporn Charuchinda)

Chairman of the Audit Committee

8.3 The Sub-Committees Report

8.3.1 The Corporate Governance and Sustainable Development Committee Report

PTTEP places importance on effective execution relating to sustainable development and adherence to good Corporate Governance and Business Ethics as well as the constant betterment of its corporate governance to ensure its alignment with the best practices for listed companies. The Committee is responsible for governing and promoting sustainable development and the corporate governance of PTTEP at all levels. The Committee comprises at least three directors, most of whom are independent directors.

In 2021, the Committee convened four times, with all incumbent directors attending every meeting and providing useful recommendations for improving the Company's performance. The duties and responsibilities of the Committee this year can be summarized as follows:

1) Considered 2021 sustainable development's target and work plan which covered three key elements under our SD framework as follows:

- High Performance Organization (HPO)
- Governance, Risk Management, and Compliance (GRC)
- Stakeholder Value Creation (SVC)

The Committee promoted and encouraged the Company to establish its proactive targets and work plans in terms of sustainable development by focusing on greenhouse gas management, greenhouse gas reduction and offsetting initiatives. Moreover, Net Zero target setting in the near future and its relevant work plan was also driven by the Committee in response to the dynamic situations and global sustainable trends while also remaining the Company's competitiveness and the ability for business expansion.

2) Monitored progress and drove the Company's operations to deliver a concrete and tangible outcome under our sustainability strategy and enhanced sustainable development operations to become dominant within the industry. Key SD activities under the Committee's advice are summarized as follows: 1) Monitored operations and studying of additional greenhouse gas reduction and offsetting initiatives together with their effective measurement, and exploration of business opportunities for low carbon energy and technology areas. The Committee also advised on greenhouse gas management which may lead to a Net Zero target and establishment of its strategy. Moreover, the Committee supported Digital Transformation of the Company to increase effectiveness as well as operating cost reductions. 2) Advised and monitored operations under our smart assurance strategy, which focused on the integration of and technology implementation in working processes, and GRC in common sense strategy. 3) Advised on how to improve operations under the strategies of the Circular Model for E&P and Ocean for Life. The Committee provided advice on communication matters in order to increase awareness of sustainability and supported effectiveness and efficiency assessment of such communication to ensure complete and timely information receipt among employees and all stakeholders. Moreover, the Committee supported social responsibility projects and encouraged studying and comparing SVC operations between the Company and other leading companies in order to escalate operations of PTTEP. These actions were conducted to ensure that the operations, both current and in the future, are in line with the strategy of the Company and create mutual value for stakeholders in a genuine and sustainable way.

3) Promoted business operations of the PTTEP Group and performance of the Board, management, and all employees in all operating areas to be in line with the Good Corporate Governance and Business Ethics (CG&BE) of the PTTEP Group. The Committee supported the improvement of CG&BE activities to allow continuity of working during working from home. For example, improvement of reporting systems to allow conflicts of interest declaration as well as the CG&BE commitment form signing for new employees via online channels, online training arrangements for the supervisory level in order to promote a role model creation and ability to advise their subordinates, communicating and encouraging its vendors to attend online training regarding anti-corruption and participating in understanding evaluations after the training. Moreover, the Committee also emphasized awareness building among employees, so that they are more aware of conflicts of interest, harassment, and No Gift Policy as well as building culture of diversity in response to business dynamics and new business targets.

4) Considered and reviewed the implementation of the Corporate Governance Code (CG Code) by means that are deemed suitable to the PTTEP Group's businesses and conducive to strengthening long-term business values. The Company also established corporate governance reporting in accordance with the SEC's CG Code and international standards as well as incorporating the CG Report into the annual report for stakeholders.

The Corporate Governance and Sustainable Development Committee constantly reported the results of all meetings to the Board for its acknowledgment. In 2021, the Committee executed its assigned tasks in accordance with its charter and amendments with prudence, competence, and independence. The Committee properly provided straightforward opinions for enhancement and betterment of corporate governance and business ethics of the organization and the optimal benefit of PTTEP, its shareholders, and stakeholders.

(Signed) *Tanarat Ubol*

(Admiral Tanarat Ubol)

Chairman of the Corporate Governance
and Sustainable Development Committee

8.3.2 The Nominating and Remuneration Committee Report

PTTEP still focuses on the “Execute and Expand” business strategy with the aim to achieve its goals and target work plan by reviewing and adjusting the work plan continuously to be congruent with the current business situation and to create value added from current projects as well as expand investment opportunities in both E&P related business and new business for the Company’s sustainable growth. The Nominating and Remuneration Committee has hence been focusing on organization readiness and organization restructuring to respond to business transformation, development of executives’ competencies, and nomination of the Company’s leaders by developing an executive succession plan. Also, the Committee has been nominating directors who are qualified, knowledgeable, and experienced fitting its core business to provide long-term competitiveness.

The Nominating and Remuneration Committee convened 8 times in 2021, summarized as follows:

- 1) Considered the principles for 2021 Board Performance Target in which the Board shall focus on monitoring and providing feedback to the management to best achieve PTTEP’s Corporate Key Performance Index (Corporate KPIs) as well as measuring the stakeholders’ perspectives towards the Company including the Corporate Governance Report of Thai listed companies (CGR) and criteria and requirements of Dow Jones Sustainability Indices (DJSI).
- 2) Set Board Target Skill Mix of the nominees in replacement of the directors who are due to retire by rotation in 2022 in the areas of Organization Change and Development, Legal, and International Market and Collaborations. Focusses on organization transformation to accommodate energy transition and readiness for investment expansion in new business, develop the full potential in commercial, marketing, and international business collaborations, set internal control and reporting systems for both domestic and international projects and also manage human resources internationally in order to promote PTTEP to be a truly multinational company.
- 3) Nominated to the Board of Directors suitable candidates with appropriate Skill Mix for consideration on election of directors and sub-committee members when positions were vacated, with due consideration for Board composition, competency, experiences that useful to PTTEP, the number of companies they were serving, and potential conflicts of interest. Also, it reviewed the principles allowing shareholders to nominate qualified director nominees in accordance to the Company’s Target Skill Mix for considerations by the Board of Directors and consequently the Annual General Shareholders’ Meeting so that major and minor shareholders are treated fairly and suitably.
- 4) Considered the Board, Sub-Committees, and Chairman’s performance assessment and report the result of the assessment to the Board of Directors.
- 5) Considered the qualifications and selection process for qualified candidates to be the Company’s leader and developed appropriate executive succession plans to accommodate the organization’s growth and to be aligned with the business environment in both short and long terms. Also, considered the CEO’s performance appraisal and remuneration.
- 6) Screened and commented to the Board of Directors on the organization restructuring and work process to support long-term corporate growth.
- 7) Reviewed the remuneration policy and organization’s salary structure based on the same industry in order to maintain competitiveness and attract high-potential of both Thai and foreigners to join the Company to support the “Execute and Expand” strategy to be accomplished.

8) Reviewed the remuneration policy and criteria for the Board and Sub-Committees on appropriate principles based on their responsibilities and consistent with long-term corporate strategy as well as being comparable to other companies in the same industry. Moreover, the Committee took the business environment into account in considering appropriate remuneration to create incentives for the Board to direct the organization to achieve its short and long-term goals together with being adaptive to the changing technology.

The Nominating and Remuneration Committee prudently and freely executed their duties to the best of their ability by providing comments for the best interest of all shareholders and stakeholders. The results of all meetings were regularly reported to the Board of Directors throughout 2021.

(Signed) *Bundhit Eua-arporn*

(Mr. Bundhit Eua-arporn)

Chairman of the Nominating and Remuneration Committee

8.3.3 The Risk Management Committee Report

PTTEP realizes the importance of risk management and commits to its efficiency and effectiveness to enable PTTEP in achieving the vision, mission, strategy, and business objectives for sustainable growth as well as short-term and long-term value creation. In 2021, it was still very challenging for PTTEP to manage risks due to the severe Coronavirus Disease 2019 (COVID-19) pandemic, oil price volatility, and the unrest situations in the countries where PTTEP has invested in i.e. The Republic of the Union of Myanmar (Myanmar) and The Republic of Mozambique (Mozambique). In addition, there are other risk factors such as declining demand for fossil fuels, import of Liquefied Natural Gas (LNG) replacing domestic gas production, disruptive technology, global warming and climate change as well as cyber security, etc. Therefore, PTTEP's Board of Directors appointed the Risk Management Committee. As of December 31, 2021, the Committee comprised 6 members, 4 of whom were independent directors. The Committee played a vital role in overseeing that PTTEP's risk management is in line with PTTEP's Board of Directors' directions to ensure that the risks are most effectively and efficiently managed.

In 2021, the Committee convened 13 times, which included a meeting with the Audit Committee. The duties and responsibilities of the Committee can be summarized as follows:

1) Governed strategic risk management in response to the dynamic changing of internal and external environment to ensure that PTTEP continues to implement its strategic plans. In the short term, the Committee considered preventive measures and mitigations to the intensity of the COVID-19 pandemic as well as oil price hedging guideline to reduce the impact on net profit from oil price volatility. In the long term, the Committee considered the implementation of PTTEP to maintain the strengths of E&P business for energy security while exploring investment opportunities in environmentally friendly energy. Moreover, the Committee considered the 2022 Work Program and Budget, 5-year (2022-2026) investment plan, and ensure the alignment with the corporate direction and sustainable development framework.

2) Closely monitored for the smooth and efficient risk management of the existing projects in accordance with Execute strategy such as (1) transition of G1/61 Project (Erawan Field) and G2/61 Project (Bongkot Field) by providing recommendations to mitigate the impact of G1/61 Project gas production shortfall due to no clarity on the site access e.g. accelerating gas production from other projects to provide energy security to the country, etc., (2) unrest situations in Myanmar and Mozambique to ensure that PTTEP has measures to cope with the situations and mitigate potential impacts. In addition, the Committee also considered exploration period extension for the exploration projects such as Malaysia - Sarawak SK 405B Project by assessing risks and economic returns.

3) Considered investment projects in order to expand in E&P and new business for energy transition including Merger & Acquisition, new exploration and establishment of subsidiaries to ensure the alignment with Expand strategies such as the acquisition of a participating interest in Oman Block 61 Project, establishment of subsidiaries to support investment in electricity and renewable energy businesses. The committee therefore assessed both risks and potential opportunities for value creation as well as provided recommendations to mitigate risks and monitor risks after investing. In addition, the Committee considered the divestment projects for portfolio rationalization.

4) Reviewed and endorsed the amendment of documents related to the enterprise risk management i.e. Risk Governance Framework, RMC Charter, Risk Appetite Statement, and Enterprise Risk Management Policy to be

in line with international standards and changing organizational contexts such as corporate strategies and practices in order to ensure risk governance is efficiently and effectively in place.

5) Furthermore, Risk Management Committee consistently oversaw enterprise risk management to ensure the businesses were operated within PTTEP's risk appetite, particularly risks related to exploration and production operations, oil price, distribution, financial, cyber security, environment, and legal, including emerging risk. The outcomes of Risk Management Committee meetings were reported to the Board on monthly basis.

In summary, during the year 2021, the Committee independently performed its duties relating to PTTEP risk management prudently, and competently for PTTEP to efficiently manage risks in order to achieve our objectives and goals for fair and maximum benefit to PTTEP, shareholders, and other stakeholders for long-term sustainability. In this regard, PTTEP has been selected as a member of the 2021 Dow Jones Sustainability Indices (DJSI) for the 8th consecutive year in the DJSI World Oil and Gas Upstream & Integrated Industry and achieved the best industry score in the area of Risk and Crisis Management for the 2nd consecutive year.

(Signed) *Penchun Jarikasem*

(Ms. Penchun Jarikasem)

Chairman of the Risk Management Committee

8.3.4 The Independent Directors Committee Report

Independent directors play a significant role in ensuring the best interests of the Company, shareholders, and stakeholders. Independent directors ensure governance, policies, and strategies implementation, together with transparency and efficient operations. This is to be certain of the equal distribution of benefits to all shareholders. PTTEP has therefore set a requirement to have independent directors more than half of the Board of Directors or enough number to influence decision making of the whole Board of Directors. Currently, the Independent Directors Committee comprises 10 directors from the total 15 Board of Directors.

In 2021, PTTEP continued to focus on growing its businesses under the Execute and Expand strategies, putting efforts to continuously review and assure achievements in the changing business environment in order to increase its competitiveness and ensure sustainable growth. The independent directors provided useful recommendations and independent comments in 4 meetings with 8 agenda items in response to the business environment and strategies. The essence of the meetings can be summarized below:

- 1) Independently considered the appointment of Chairman of the independent directors committee and Vice Chairman of the independent directors committee in accordance with the Independent Directors Committee Charter.
- 2) Considered the agenda items related to policies and investment strategies in relations to overall the PTT Group's business i.e. LNG business and real estate, by taking into account the changing business environment. The consideration is made without influence from major shareholders and leads to the decision making of the whole Board of Directors. Monitoring on implementation has been continuously conducted to ensure equal benefits to all shareholders and the Company.
- 3) Considered the outcomes of corporate governance appraisal related to independent directors in accordance with domestic and international best practices so as to review and drive CG in substance and better corporate governance in the Company.
- 4) Considered the Independent Directors Committee Report in the 56-1 One report for distribution to all stakeholders.

The Independent directors fully executed their duties and promoted transparency in the meeting. In the event that a Director is shown to have a conflict of interest with any of the agenda items, he must abstain from expressing an opinion and voting on the agenda items and leave the meeting room when the issue is discussed to allow the other Directors to express their opinions freely. An exception can be made if the other Directors voted unanimously to allow the Director to stay in the meeting room to provide information for the agenda so that the Board can deliberately make a decision. However, the Director is not allowed to vote or decide on an issue having conflict of interest. This is to ensure that the decisions are made for the best interest of the Company without diminishing shareholders' rights, especially minority shareholders and all stakeholders.

(Signed) *Krairit Euchukanonchai*

(Mr. Krairit Euchukanonchai)

Chairman of the Independent Directors Committee

9. Internal Controls and Connected Transactions

9.1 Internal Controls

PTTEP places great emphasis on continuous development of the internal control system by employing the Committee of Sponsoring Organizations of the Treadway Commission (COSO) or COSO 2013 Framework to our business activities adequately and appropriately. This is to provide reasonable assurance that (1) the Company's operations including utilization of resources is efficient and effective, and the safeguarding of its assets, (2) reporting for both financial and non-financial reports are accurate, reliable, and timely, and (3) all business operations are in compliance with relevant laws and regulations. PTTEP also establishes the Internal Control Unit reporting to the Governance, Compliance, Internal Control, and Subsidiary Management Department to be responsible for governing and supporting our business operations in alignment with the Internal Control Policy as well as to assess the efficiency of the internal control system throughout the organization, which is subsequently reported and reviewed by the Audit Committee every year.

9.1.1 Sufficiency and Suitability of the Internal Control System

PTTEP assesses its internal control system annually based on the five components of the COSO 2013 Framework, namely (1) Control Environment, (2) Risk Assessment, (3) Control Activities, (4) Information and Communication, and (5) Monitoring Activities. It also employs the Self-Assessment Form provided by the Office of the Securities and Exchange Commission of Thailand (SEC). The 2021 assessment results are as follows:

1. Control Environment

PTTEP has established a sufficient and suitable control environment which promotes effective and efficient business operations. The Board of Directors ("Board") and management team also continuously cultivate an ethical working attitude and atmosphere where the Company's internal control system is conducted according to the Good Corporate Governance and Business Ethics of the PTTEP Group (CG&BE) in order to achieve the ultimate objectives: Growth, Prosperity, Stability, Sustainability, and Dignity. The main activities conducted by our control environment can be summarized as follows:

- PTTEP has specified a written principle of Good Corporate Governance and Business Ethics (CG&BE) as its highest internal regulation of the PTTEP Group. The Board as well as management and employees at all levels are required to sign the commitment form to formally acknowledge and strictly conform to the CG&BE accordingly. They are also required to self-assess their conflicts of interest annually. Moreover, Integrity & Ethics are also embedded as one of the PTTEP's corporate values (*EP SPIRIT*) to emphasize that CG&BE principles shall be implemented as a fundamental concept of our transparent and auditable business operations. All employees will also receive a formal communication regarding our CG&BE along with its booklet to be used as a reference since the very beginning of their employment.
- PTTEP emphasizes the communication of good practices, according to the CG&BE and the consequential penalties in case of a breach to ensure that it is well understood by the management and employees, both domestically and internationally, through email communications and other activities such as email alerts regarding blackout periods for stock trading to prevent insider trading issues, induction programs for new directors and employees, as well as live training and e-learning. PTTEP also publicizes the CG&BE on its website for external stakeholders' communication and demonstrates a strong will to encourage our business alliances including joint-venture partners, suppliers/vendors, and

company representatives to operate their businesses with integrity and to avoid involvement in any form of corruption. In addition, online training and examination are also specifically arranged for our vendors to ensure that PTTEP's anti-corruption practices are well-understood. The Company also has a clear stance to fight against corruption together with the public sector and civil society by continually participating in anti-corruption activities such as being certified by Thai Private Sector Collective Action Against Corruption (CAC) for the 3rd consecutive term, as well as supporting the International and National Anti-Corruption Day.

- PTTEP monitors and assesses whether our business ethics (on par with the code of conduct) are being followed by the Second Line Roles and the Third Line Roles to ensure that the management and employees can effectively integrate ethical conduct into their work courses. To exemplify, the business ethics on Procurement and Contract has the Supply Chain, Procurement, and Contracts unit perform the second line roles, whereas the Internal Audit Division plays the third line roles to independently audit operations to ensure conformance to internal regulations and efficiency of the Company's internal control system in accordance with the international standards. Additionally, PTTEP is regularly evaluated by external independent parties such as assessments by the Corporate Governance Report of Thai Listed Companies held by the Thai Institute of Directors Association (IOD), the Dow Jones Sustainability Indices (DJSI), the ASEAN Corporate Governance Scorecard, and the Thai Private Sector Collective Action against Corruption (CAC).

- PTTEP establishes clear segregation of duties (SoD) between the Board and management. The Board's duty is to develop corporate goals and strategies without performing routine operations as the management do, and to oversee and follow up on the business performance of the management to achieve strategic plans, operational direction, objectives, and specified policies. The Board also ensures that strategies and policies are practical and suitable enough to allow the management team to smoothly and efficiently operate under the business environment at the particular time and thus enable for the Company's sustainable growth, where the management would report our operational performance to the Board on a regular basis. The Board also places high importance on the execution of Governance, Risk Management and Compliance (GRC), which is one of the key aspects under our SD Framework, for both domestic and international assets by approving the GRC strategy, work plan, and long-term goals, as well as appointing the Corporate Governance and Sustainability Development Committee to oversee and provide advice concerning GRC-related operations. The Company has moreover extended GRC standard to our overseas operations. This can be exemplified by the conduct of GRC Maturity Assessment during 2021 for Malaysia Asset, which the Company acquired in 2019, in order to formulate appropriate improvement plans relative to GRC. Furthermore, the Board has assigned the Audit Committee to oversee and raise observations on the Company's internal control system, internal audit system, and financial reports, as well as the appointment of the external auditor which are in line with the roles and duties set out in the Audit Committee Charter.

- PTTEP's organization structure is appropriately designed in accordance with our main business of exploration and production, with flexible and efficient collaboration that are in line with internal control principles, such as SoD and checks and balances, so as to support corporate strategic plans and ensure our resource utility management. In 2021, to appropriately support our business growth, the Company conducted organizational restructuring in related areas; for instance, the reorganization to support asset transitions and the establishment of new business units, including the Middle East Commercial Section and Planning Section as well as the Non-E&P Business Management Department.

- PTTEP has appropriate reporting-line structures and hierarchy of authorities of the Company's business requirements and responsibilities of the management and employees, which are clearly defined and documented in the Company's Functional Description and the Delegation of Authority and Signatures (DAS). In 2021, PTTEP conducted DAS Transformation Project which concerns the revision and clarity enhancement of DAS contents, based on appropriate internal control principles, to support the Company's rapid growth in both E&P and non-E&P sectors. Moreover, the Company has DAS Digitalization project underway to support PTTEP's New Way of Working, as well as the enhancement of the Delegation Workflow system to allow authority delegation appointment of appropriate representatives, when required, for maintaining proper operations and integrity in accordance with company orders.

- PTTEP has an extensive set of human resource management regulations and policies which focus on attracting, developing, and retaining employees to support short-term and long-term organizational growth. In 2021, the Company also focused on personnel development areas to support new businesses, such as liquefied natural gas (LNG). In addition, PTTEP has specified 11 new soft skills that the employees shall develop to keep up with the dynamic business environment, as well as to utilize technology for the enhancement of work efficiency and the support for corporate sustainability. Examples of soft skills are innovative thinking, digital literacy, and operational performance of sustainability.

- PTTEP also continuously reviews current and future manpower demands to support business growth and future expansion by specially focusing on the development of existing employees. In addition, specific development plans for high potentials, management succession plans, job rotation, and promotion plans have also been developed. Additionally, employee engagement gives importance; a survey is regularly carried out to obtain current employee satisfaction levels and to create improvement plans for higher levels of employee engagement.

- PTTEP has an established process of employee performance appraisal where the factors such as achievability, practicality, and alignment with current corporate strategy have been taken into account. Employees and their supervisors are encouraged to periodically review their KPI targets, progress, or any limitations so that appropriate revisions could be agreed. The Company also maintains a pay-for-performance compensation system to retain highly competent individuals. Consequently, employees' merit increases, bonuses, as well as promotions are subject to their performance appraisal results to complement and retain those with outstanding performance and compatible attitudes to corporate values (*EP SPIRIT*). From 2019, the Company has also introduced the implementation of its 360 Degree Evaluation System as a tool to assess a given employee's behavioral attributes against *EP SPIRIT*. The 360 Degree Evaluation is also an essential part of an individual's KPIs as it helps to reflect an employee's performance on all-round aspects by including evaluations from peers and subordinates apart from direct supervisors.

- PTTEP has established both Internal Control Policy and the Internal Control Standard. These documents have been consistently communicated to the management and employees through training courses, activities, and publications such as the GRC program, to ensure accurate understanding of the principles, roles, and responsibilities of each individual in relation to the internal control system. Moreover, PTTEP, which is defined as a state enterprise under the State Fiscal and Financial Disciplines Act, B.E. 2561 (2018), appointed its Internal Control Committee as stipulated by the Ministry of Finance's Rule on Internal Control Standard and Guidelines for Government Agency, B.E. (2018) in order to ensure that the Company's operations are in compliance with the mentioned laws and regulations.

2. Risk Assessment

PTTEP places importance on risk management by appointing the Risk Management Committee, which is responsible for setting policy, risk appetite, and risk metrics & limits, as well as oversee the effectiveness of the company-wide risk management. The Company has also applied the ISO 31000 Risk Management and COSO Enterprise Risk Management (ERM) concepts company-wide as well as the assessment of key risks related to our businesses, including fraud risk or risks which may arise as a result of significant changes to the Company, to appropriately manage such risks in a timely manner. These risk management approaches can be summarized as follows:

- PTTEP has specified a Risk Governance Framework and documents related to risk management including Risk Appetite Statement, Corporate Level Risk Metrics & Limits, and Enterprise Risk Management Policy to clearly define roles, responsibilities, and authorities relevant to risk management at all levels across the Company, including the Board, the Risk Management Committee, and the management, as well as supporting and operational business units. It is also ensured that the contents under each document are updated and aligned with the dynamic business environment as well as being communicated on a regular basis.

- PTTEP regularly communicates its Risk Management Standard, Guidelines, Process, and Tools to the management and employees through various channels, such as training to employees as well as Risk Coordinators, workshops, and email communication to enhance personnel's understanding and to ensure that they can apply the concepts and practices to their work responsibilities in order to ensure the Company's objective achievement.

- PTTEP develops a Business Continuity Management Policy, Business Continuity Management Standard and Corporate Business Continuity Procedure. In 2021, the policy, standard, and procedure were reviewed and revised for more appropriate practices. Furthermore, the Company continuously develops and improves the Business Continuity Management System in alignment with the ISO 22301:2019 standard as demonstrated by the certifications possessed by critical assets, namely the recertifications of PTTEP Myanmar Asset and PTTEP Petroleum Development Support Base (PSB) in Songkhla as well as maintaining the certifications for PTTEP Headquarters in Bangkok and S1 Project. As for our operations during the time of the Coronavirus-19 (COVID-19) outbreak, PTTEP has been able to maintain smooth operations in accordance with the Business Continuity Management Policy as specified.

- PTTEP manages risk throughout the organization based on four risk categories, namely Strategic Planning and Management, Investment and Divestment Decision Making, Capital Project Management, Operations and Business Process, and Environmental, Social, and Governance (ESG). In addition, the Company has developed its new web-based risk register system for relevant units to identify and assess risk at all levels, ranging from corporate, functional group, division, and department levels to asset/project levels.

- Risk mitigation plans are developed, executed, and monitored to reduce the levels of risk through various measures. Key Risk Indicators (KRIs) are also prepared to provide early warnings of risk to prevent and timely develop mitigation plans for risks that can potentially obstruct the Company from achieving its business objectives. Furthermore, to cope with the corporate digital transformation scheme, PTTEP is also developing the risk management chatbot with the aim to compile a more complete set of risks relative to the Company.

- PTTEP appointed a Hedging Committee to oversee and manage petroleum price risk and financial risk more efficiently.

- At the corporate level, PTTEP assesses business activities that face high exposure to fraud risk, which comprises asset misappropriation, corruption, fraudulent practices, and misstatement of financial reporting. The Company considers historical information, incentives and/or pressure, opportunities, and rationalization of fraud to evaluate the likelihood and develop its Corporate Risk Profile.

- At the process level, process owners are responsible for managing both fraud and operational risk arising from processes under their responsibilities and developing internal controls corresponding to such risks with the aim to effectively improve our internal control system.

- PTTEP performs risk assessment from all-round factors that may impact corporate performance, including (1) internal factors such as strategic risk, exploration, development, and production risk, investment risk of existing and new projects, etc. and (2) external factors from volatility risk in oil prices, foreign-exchange rates, interest rates, etc. The Company has, continuously from 2020, assessed possible risks that may affect our operations, both in short and long term, which may result from the continuous COVID-19 outbreak as well as the situation in Myanmar in 2021 in which PTTEP operates in.

- PTTEP's Audit Committee assigned the Internal Audit Division to carry out audits on high-risk areas which can lead to fraud. The Internal Audit Division is also responsible for undertaking an investigation of any suspected fraud cases upon receipt of a report, or as requested by the Audit Committee and/or the Chief Executive Officer (CEO).

- PTTEP regularly monitors and reviews strategic plans to ensure that business goals remain reasonable and consistent with the changing situations. The Company closely monitors changes in key factors that may affect PTTEP, such as oil prices, global and domestic economies, geopolitics, foreign exchange rates, laws and regulations, government policies, and technological advancements. This is to ensure that PTTEP is able to respond to the risks that have arisen from such factors or any emerging risks from our new operations in a timely manner and is able to adjust its operation to the disruption of technologies and alternative energy which play more important role in the energy industry.

3. Control Activities

PTTEP has adequate control activities which are able to mitigate risks to acceptable levels for their respective business environments or activities of each unit. Control activities have been established to mitigate risks and these are also periodically reviewed and improved. For instance, deployment of control is done through the practices and regular reviews of policies and work procedures, or usage of technology. The Company also encourages employees to be strictly and constantly aware of the importance of conformance to the control activities and compliance with related laws and regulations to ensure that our internal control system is as effective as designed. Our key control activities can be summarized as follows:

- PTTEP has extensive sets of written policies and work procedures which the management and employees must strictly comply with, whereas the management and supervisors are responsible for overseeing and monitoring compliance with such policies and work procedures. In 2021, to ensure higher work efficiency within the organization, the Company developed and updated corporate policies, standards, and guidelines to improve work efficiency, such as documents related to digital and technology management, Risk Management Committee Charter, Compliance Policy, Human Rights Policy, Insider Trading Prevention Standard, and the Personal Data Protection Standard for Employees.

- PTTEP recognizes the significance of control activities at the process level, including SoD, review, and authorization of transactions, to ensure that the Company's business operations are efficient and able to prevent fraudulent acts. In 2021, the Company carried out a number of business process improvements to achieve higher levels of work efficiency and effectiveness as well as to develop and revise process controls through control self-assessment (CSA) such as Non-E&P Business Management and Sustainable Development Management processes. In addition, the Company regularly monitors contractors/suppliers to ensure that they comply with contract agreements by using control measures such as Contract Management Procedure review and improvement, random implementation assessment against the procedure, and random contractual compliance assessment. During the year, PTTEP moreover improved our financial model, which was used to support the analysis of our contractors/suppliers' financial strength, to be more concise and align with internal standards.

- PTTEP develops general controls over IT system and physical equipment security, including data backup and recovery, to ensure business continuity from any disruption. This IT security policy was announced across the organization in keeping with good corporate governance. The Company has also continuously utilized various information system activities that would ensure operational security and flexibility, especially to support the work-from-home scheme during the lockdown period from the COVID-19 outbreak, such as setting up the Cybersecurity Operation Center, which operates 24 hours, implementation of Multi-factor Authentication, and Phishing Email Reporting and Training. In 2021, PTTEP put in place the E-meeting Guidelines and Practices for the Board as well as adopted the Cybersecurity Capability Maturity Model (C2M2) Framework to more effectively assess risks related to IT system.

- PTTEP appoints its IT Steering Committee to provide IT strategic directions, goals, strategies, policies, and standards, including investment direction in the IT Master Plan and Roadmap to mitigate IT risk to an acceptable level.

- PTTEP governs its subsidiaries, associated companies, and joint ventures by assigning the Company's management and employees to manage these entities. The Company has developed the Subsidiary Directors' Guidelines for the assigned persons to ensure standardized Subsidiary Directors' Roles and Responsibilities. As for the governance of PTTEP and our subsidiaries, PTTEP's DAS is the reference for E&P businesses while the assigned directors from PTTEP are in charge of non-E&P businesses. The Internal Audit Division also has the responsibility to audit Assets/Projects in which the Company has invested. In 2020, PTTEP established the Non-E&P Business Management Department to systematically monitor the performance as well as changes in policies and operations of our new investments to ensure alignment with PTTEP's standards.

- PTTEP regularly reviews policies, standards, and work procedures to ensure that work processes and defined control activities are effectively and efficiently managed against relative risk when changes occur. In 2021, the Company revised policies, standards, and work procedures for greater efficiency, such as the issuance and communication of the Personal Data Protection Standard for Employees which expresses our commitment to safeguarding the personal data of both employees and external related parties, including notification of the data owner's rights. This is to ensure our employees are aware of their duties to comply with internal and external laws and regulations. For internal regulations, the owners of those documents are responsible for ensuring compliance with the stated requirements. Another example is the revisions of the Management System Document, including regulations, policies, standards, procedures, and guidelines, so as to enhance operational efficiency.

4. Information and Communication

PTTEP realizes the significance of information and communication, particularly the quality of data processing systems, to provide accurate, complete, up-to-date, and timely information which is appropriate and sufficient to support business operations and make effective decisions. The Company has effective internal and external communication systems in place to support the functioning of the internal control system as well as a special communication channel to allow our stakeholders to confidentially report their concerns or complaints. Our key information and communication activities can be summarized as follows:

- PTTEP validates data and information from internal and external sources after being reviewed by the responsible units before making decisions. In addition, the Company imposes the confidentiality and accessibility of usage as well as protection of information in both physical and digital formats, including data classification to prevent the disclosure of the Company's sensitive or confidential information.
- PTTEP has developed a Corporate Reference Document Center or "FindMe" as the information technology infrastructure to store and manage important business documents through a single access channel. This includes documents related to digital and technology management, such as Data Security Management Guideline and Data Quality Management Guideline.
- For internal communication, PTTEP has effective and efficient internal channels to ensure that the management and employees can access essential information for their work requirements, especially during the work-from-home period under the COVID-19 outbreak. To exemplify, online meetings and information exchanges via Cloud heavily rely on digital internal communication applications. The Company communicates objectives and responsibilities of internal control through internal meetings and emails. PTTEP has also set up the "Call Tree" network for communication when any crisis arises. From 2020, the Company has organized a taskforce team to specially monitor the COVID-19 outbreak situation and act as a centralized team to communicate response measures for alignment of practices throughout the Company. This arrangement exists most importantly for the purpose of continual business operations and ultimately to ensure the achievement of our business objectives. Moreover, the Company's management has arranged Online Live Townhalls, both at corporate and function group levels, as another centralized communication means to stress the importance of internal control during the new working method.
- For external communication, PTTEP established business units which are responsible for communicating with each specific group of stakeholders, such as Investor Relations, Corporate Communication, and Corporate Secretary units. This is to ensure that information disclosed to external stakeholders is accurate, complete, sufficient, transparent, timely, and regularly communicated. In 2021, the Company continually provided updated information to our stakeholders, particularly on the progress of our Execute and Expand strategy as well as activities relative to Corporate Social Responsibility (CSR), in areas such as Ocean for Life Strategy and innovations in collaboration with AI and Robotics Ventures Company Limited (ARV). The Company also provided information publications for analysts, fund managers, and shareholders to enhance better understanding of the E&P business of which the majority was completed via digital media since the beginning of the COVID-19 outbreak, for instance, Digital Roadshow and Virtual Conference.

- PTTEP maintains the availability of our whistleblowing channels for employees and external stakeholders to accurately, completely, and timely report wrongdoings by our directors, the management, employees, or third parties acting on behalf of the Company. Based on the PTTEP Reporting and Whistleblowing Regulation, complaints can be reported through various channels such as letter, email, and reporting system on the Company's website. From 2020, the Company enhanced its Whistleblowing System to fulfill the coverage of complaints management by our overseas operations.

5. Monitoring Activities

PTTEP regularly monitors and assesses the effectiveness of our internal control system through ongoing evaluations which are built into the Company's daily operating activities along with separate evaluations to ensure that the system is sufficient and suitable for the current business environment and dynamic risk factors. Subsequently, once the deficiencies are identified, improvement plans will be developed and responsible parties will be assigned to respond with timely resolutions. For separate evaluations, the Company has developed control self-assessment evaluations (CSA) on an annual basis at both corporate and business process levels. In addition, the Internal Audit Division, which has a direct reporting line to the Audit Committee, has the responsibility for performing independent audits correspondingly. PTTEP's monitoring activities can be summarized as follows:

- PTTEP performs two levels of CSA, namely (1) corporate and (2) process levels. For the corporate level, evaluation is conducted by management review through an online survey. In 2021, the methodology for this corporate-level survey was adjusted for the main purpose of utilizing analytical results for further improvements in the internal control system and relative measures. While at the process level, related process owners are required to assess controls of their processes. Consequently, Continuous Control Self-Assessment (CCSA) system will be conducted as a continuous monitoring tool at least twice a year.

- The Governance, Compliance, Internal Control, and Subsidiary Management Department are responsible for monitoring, reviewing, and reporting of (1) compliance with external laws and regulations and (2) compliance with internal regulations and policies in high-risk areas. Such reports are to be submitted to the CEO on a monthly basis and to the top management every quarter. Additionally, the report of item (1) shall be presented to the Audit Committee Meeting at least twice a year. In case there is any non-compliance case with significant impact on the PTTEP Group, the management shall report such matter to the Board of Directors as appropriate.

- PTTEP requires all employees to at least once a year submits the annual conflicts of interest disclosure and at least twice per year for employees under the Procurement Unit or declare whenever there is an involvement in such activities. In 2021, the Company introduced the online PTTEP CG&BE Report System to enhance the efficiency of conflicts of interest reporting and information compilation.

- The Internal Audit Division (CIA) is responsible for auditing and providing recommendations for improvement to ensure that the defined controls have been complied with. The CIA is also responsible for providing recommendations or developing improvement plans to resolve any issues identified and then subsequently communicate with responsible parties, including the Internal Control unit, to further support the remediation, and regularly report the findings and improvement progress to the Audit Committee. Moreover, in 2021, the CIA also enhanced the Audit Management System to include automated action tracking for higher efficiency in monitoring and implementation of improvement plans.

- In addition to the established Continuous Control Monitoring System (CCMS) for Procure to Pay process, the CIA also extended CCMS to inventory management process in 2020 where the system shall notify the responsible parties in case any irregular transactions are detected for appropriate modifications. Furthermore, PTTEP's whistleblowing channel is another method of monitoring and assessing the Company's CG&BE implementation.

Board of Directors' Evaluation of PTTEP's Internal Control System

For the year 2021, the Board of Directors evaluated PTTEP and its subsidiaries' internal control system, subsequent to the Audit Committee's review. It can be concluded that the PTTEP Group's internal control system based on the aforementioned five components, including relative developments during 2021, is sufficient and suitable. The PTTEP Group assigned an adequate and appropriate proportion of human resources to efficiently operate business in accordance with its internal control system which enables the effective and sufficient monitoring and prevention of possible misconducts including asset misappropriation by any unauthorized directors or management individuals, including entering into transactions with persons with potential conflicts of interest or related parties.

9.1.2 Internal Control Deficiencies

-None-

9.1.3 Audit Committee's Evaluation in case it is different from the Board of Directors

-None-

9.1.4 Audit Committee's opinion on the position of the Head of the Internal Audit Division

The Audit Committee deems that the Head of the Internal Audit Division has an educational background, work experiences, and necessary knowledge that is sufficient enough to perform duties. Details are disclosed in the "Other significant Information" section, under the "Head of the Internal Audit Division" topic.

9.1.5 Practices for the appointment, transfer, removal, of the Head of the Internal Audit Division

The Audit Committee has a duty to endorse the appointment, transfer, removal, promotion, and performance appraisal of the Head of the Internal Audit Division. Details are disclosed in the "Other Significant Information" section, under the "Head of the Internal Audit Division" topic.

9.2 Connected Transactions

9.2.1 Connected transactions at PTTEP and our subsidiaries with other entities that may result in conflicts of interest in the fiscal year ending December 31, 2021, are as follows:

Connected Person	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
PTT Public Company Limited ("PTT")	- PTT, the Company's major shareholder, (directly) holds 63.79% of the Company's registered and paid-up capital. - PTT's executives who serve as PTTEP's directors are: - Mr. Auttapol Rerkpiboon - Mr. Atikom Terbsiri	Petroleum product sales: crude oil; natural gas; liquefied petroleum gas; and condensate - Total income - Accounts receivable	4,712.23 504.21	Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.

Connected Person	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
		Other income includes: - Income from infrastructure services to support petroleum development such as warehouse, helicopter, and accommodation for PTT personnel at Arthit and Bongkot projects - Income from maintenance of natural gas meters - Income from charges to PTT for working areas at Arthit and Bongkot projects' production platforms based on the Gas Sales Agreement - Income from charges to PTT for gas receiving areas, working areas, and accommodation on platforms based on the Greater Bongkot South field's Gas Sales Agreement		Conditions and price setting for other income follow normal business operations, at an arm's length basis for non-related persons or operations.

Connected Person	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
		- Income from the jetty and warehouse rentals at Songkhla base - Income from the Company's personnel seconded to PTT - Income from services provided by AI and Robotics Ventures Company Limited ("ARV") (a subsidiary of PTTEP) - Income from service charges for management's drivers based on the agreement between PTT and PTTEP Services (a subsidiary of PTTEP) - Income from office building rental and facility management provided by Energy Complex Company Limited ("EnCo") (a subsidiary of PTTEP) - Total income - Accounts receivable	12.07 4.15	

Connected Person	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
		Purchase of petroleum products and related expenses, manpower charges for PTT personnel seconded to the Company and subsidiaries, and other expenses ▪ Total expenses ▪ Accounts payables including rental deposit for office building/service provided by EnCo	5.92 1.29	• Conditions and price setting for the purchase of petroleum products, related equipment, related services, and other expenses follow normal business operations, at an arm's length basis for non-related persons or operations. • Manpower rates are based on the actual rates PTT pays to employees seconded to PTTEP.
		Deferred compensation that is the Company's obligation based on the Arthit Project's Gas Salesreemnt ▪ Accounts payables	1.76	• Conditions and price setting follow normal business operations at an arm's length basis for non-related persons or operations.
Energy Complex Company Limited ("EnCo")	• PTT, the Company's major shareholder, holds 50% of EnCo's registered and paid-up capital. • PTTEP, EnCo's major shareholder, holds 50% of EnCo's registered and paid-up capital.	Income from the following services: • Dividend income • Income from the Company's personnel seconded to EnCo • Income from services provided by ARV (a subsidiary of PTTEP) ▪ Total income ▪ Accounts receivable	0.05 0.02	• Manpower rates are based on the actual rates the Company pays to employees seconded to EnCo.

Connected Person	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
		The Company signed a loan contract with EnCo under the following conditions: • Expiration date is June 30, 2022 • Reference interest rate follows the loan contract between EnCo and Krungthai Bank Public Company Limited, dated April 2, 2009 (contract amendment is included.) • EnCo paid the remaining loan including interest on July 30, 2021 ▪ Interest income ▪ Loans outstanding	0.20 -	• The mentioned contract follows the conditions of the loan contract signed by EnCo and Krungthai Bank Public Company Limited, dated April 2, 2009 (contract amendment is included.) with the financial support of all of EnCo's shareholders proportionately.
		Expenses from the following services: • The Company has signed a 3-year lease agreement with EnCo to rent the office building, storage, and common areas at the Energy Complex. The Company is eligible to extend its lease agreement for another 3 years. • The hotel fee at THE EnCony Residential Hotel located in Rayong Province ▪ Total lease and service expenses ▪ Accounts payable	18.39 0.0034	• The leasing rate is based on the market rate of the office building lease and follows normal business operations, at an arm's length basis for non-related persons or operations.

Connected Person	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
PTT Digital Solutions Company Limited ("PTT Digital")	- PTT, the Company's major shareholder, holds 20% of PTT Digital's registered and paid-up capital. - PTTEP holds 20% of PTT Digital's registered and paid-up capital.	Income from the following services: - Income from the Company's personnel seconded to PTT Digital - Dividend income - Income from office building rentals and facility service, such as water, electricity, air conditioning, and parking provided by EnCo (a subsidiary of PTTEP) - Total income 4.62 - Accounts receivable 0.62		- Manpower rates are based on the actual rates the Company pays to employees seconded to PTT Digital. - Conditions and price setting follow normal business operations at an arm's length basis for non-related persons or operations.
		The Company and subsidiaries have signed a contract with PTT Digital for IT services and communications. - Total expenses 30.74 - Accounts payables including rental deposit for office building/service provided by EnCo 5.54		Conditions and price setting follow normal business operations at an arm's length basis for non-related persons or operations.

Connected Person	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
PTT Energy Resources Company Limited ("PTTER")	PTT, the Company's major shareholder, holds 100% of PTTER's registered and paid-up capital.	Income from office building rentals and facility service, such as water, electricity, air conditioning and parking provided by EnCo (a subsidiary of PTTEP) - Total income - Accounts receivable	0.15 0.0013	Conditions and price setting follow normal business operations at an arm's length basis for non-related persons or operations.
		Rental deposit for office building/service provided by EnCo (a subsidiary of PTTEP) Accounts payable	0.03	Conditions and price setting follow normal business operations at an arm's length basis for non-related persons or operations.
PTT Energy Solutions Company Limited ("PTTES")	- PTT, the Company's major shareholder, holds 40% of PTTES's registered and paid-up capital. - GC, TOP, and IRPC, whose major shareholder is PTT, hold 20%, each of PTTES's registered and paid-up capital.	Income from office building rentals and facility service, such as water, electricity, air conditioning and parking provided by EnCo (a subsidiary of PTTEP) - Total income - Accounts receivable	0.01 0.0001	Conditions and price setting follow normal business operations at an arm's length basis for non-related persons or operations.
		Rental deposit for office building/service provided by EnCo (a subsidiary of PTTEP) Accounts payable	0.0026	Conditions and price setting follow normal business operations at an arm's length basis for non-related persons or operations.

Connected Person	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
Business Services Alliance Company Limited ("BSA")	PTT, the Company's major shareholder, holds 25% of PTTER's registered and paid-up capital. <u>Remark:</u> BSA is a wholly-owned subsidiary as PTT holds all common shares of BSA.	Income from office building rentals and facility service, such as water, electricity, air conditioning and parking provided by EnCo (a subsidiary of PTTEP) - Total income - Accounts receivable		Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
			0.14 0.01	

Connected Person	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
		Expenses from the following services: - Manpower charges for BSA personnel seconded to PTT Global LNG Company Limited ("PTTGL") (a subsidiary of PTTEP) - Manpower charges for BSA personnel providing services, based on the agreement between BSA and EnCo (the subsidiary of PTTEP) at (1) Energy Complex, (2) PTT headquarters, (3) PTT Research and Technology Institute in Wang Noi District, Phra Nakhon Si Ayutthaya Province, and (4) PTT Research and Technology Institute in Wang Chan District - Total expenses - Accounts payables including rental deposit for office building/service provided by EnCo	0.85 0.12	Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.

Connected Person	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
IRPC Public Company Limited ("IRPC")	PTT, the Company's major shareholder, holds 45.05% of IRPC's registered and paid-up capital.	Income from office building rentals and facility service, such as water, electricity, air conditioning and parking provided by EnCo (a subsidiary of PTTEP) - Total income - Accounts receivable	1.47 0.01	Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
		Service fee for equipment inspection of "Pressure Transmitter Yokogawa Model & Pressure Gauge Precision Range" which is used for measurement of gas pressure for S1 Project - Total expenses - Accounts payable	0.0004 -	Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
		Rental deposit for office building/service provided by EnCo (a subsidiary of PTTEP) Accounts payable	0.31	Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
Dhipaya Insurance Public Company Limited ("TIP")	PTT, the Company's major shareholder, holds 13.33% of TIP's registered and paid-up capital.	Income from office building rentals and facility service, such as water, electricity, air conditioning and parking provided by EnCo(a subsidiary of PTTEP) - Total income - Accounts receivable	0.0008 -	Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.

Connected Person	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
		Expenses for the Company and subsidiaries' assets insurance, and our employees' health and life insurance ▪ Total expenses ▪ Accounts payables	10.43 0.0006	• Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
Thai Oil Public Company Limited ("TOP")	• PTT, the Company's major shareholder, holds 45.03% of TOP's registered and paid-up capital.	Income from the following services: • Income from office building rentals and facility service such as water, electricity, air conditioning, and parking provided by EnCo (a subsidiary of PTTEP) • Income from services provided by ARV (a subsidiary of PTTEP) ▪ Total income ▪ Accounts receivable	1.01 0.32	• Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
		Rental deposit for office building/service provided by EnCo (a subsidiary of PTTEP) ▪ Accounts payables	0.43	• Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.

Connected Person	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
PTT Global Chemical Public Company Limited ("GC")	PTT, the Company's major shareholder, holds 45.18% of GC's registered and paid-up capital.	Income from the following services: - Income from meeting room rentals - Income from office building rentals and facility service, such as water, electricity, air conditioning, and parking provided by EnCo (a subsidiary of PTTEP) - Total income 2.33 - Accounts receivable 0.03		Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
		Mercury analysis fees for PTTEP SP Gas Processing Plant - Total expenses 0.01 - Accounts payable 0.0004		Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
		Rental deposit for office building/service provided by EnCo (a subsidiary of PTTEP) Accounts payable 0.54		Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
		Income from office building rental and facility service, such as water, electricity, air conditioning and parking provided by EnCo (a subsidiary of PTTEP) - Total income 0.20 - Accounts receivable 0.0020		Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
PTT Natural Gas Distribution Company Limited ("PTT NGD")	PTT, the Company's major shareholder, holds 52% of PTT NGD's registered and paid-up capital.			

Connected Person	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
		Rental deposit for office building/service provided by EnCo (a subsidiary of PTTEP) Accounts payable	0.04	Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
PTT Retail Management Company Limited ("PTTRM")	- PTT, the Company's major shareholder, holds 75% of PTOR's registered and paid-up capital. - PTOR, the major shareholder of PTTRM, holds 100% of PTTRM's registered and paid-up capital.	Income from office building rental and facility service, such as water, electricity, air conditioning and parking provided by EnCo (a subsidiary of PTTEP) - Total income - Accounts receivable	0.06 0.01	Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
		Expenses for drinking water for EnCo (a subsidiary of PTTEP) - Total expenses - Accounts payables including rental deposit for office building/service provided by EnCo	0.0006 0.0067	Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
PTT Tank Terminal Company Limited ("PTT Tank")	PTT, the Company's major shareholder, holds 100% of PTT Tank's registered and paid-up capital.	Income from office building rentals and facility service, such as water, electricity, air conditioning and parking provided by EnCo (a subsidiary of PTTEP) - Total income - Accounts receivable	0.11 0.08	Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.

Connected Person	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
Trans Thai-Malaysia (Thailand) Limited ("TTM")	PTT, the Company's major shareholder, holds 50% of TTM's registered and paid-up capital.	Rental deposit for office building/service provided by EnCo (a subsidiary of PTTEP) Accounts payables	0.0049	Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
		Income from the following services: - Income from warehouse rentals at Songkhla base - Income from office building rentals and facility service such as water, electricity, air conditioning, and parking provided by EnCo (a subsidiary of PTTEP) - Total income - Accounts receivable	0.01 0.0017	Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
PTT International Trading Pte. Ltd. ("PTTT")	PTT, the Company's major shareholder, holds 100% of PTTT's registered and paid-up capital.	Petroleum product sales: crude oil - Total income - Accounts receivable	82.62 -	Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
		Expense from oil price hedging contracts - Total expenses - Accounts payable	15.84 1.69	Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.

Connected Person	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
PTT International Trading London Ltd. ("PTTT LDN")	PTT, the Company's major shareholder, holds 100% of PTTT LDN's registered and paid-up capital.	Petroleum product sales: crude oil - Total income - Accounts receivable	57.69 12.47	Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
Global Power Synergy Company Limited ("GPSC")	- PTT, the Company's major shareholder, holds 22.81% of GPSC's registered and paid-up capital. - Co-director is Mr. Atikom Terbsiri.	Income from the following services: - Income from manpower charges based on the agreement between GPSC and PTTEP Services (a subsidiary of PTTEP) - Income from office building rentals and facility service such as water, electricity, air conditioning, and parking provided by EnCo (a subsidiary of PTTEP) - Total income - Accounts receivable	1.02 0.21	Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
		Rental deposit for office building/service provided by EnCo (a subsidiary of PTTEP) Accounts payable	0.08	Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.

Connected Person	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
PTT Global LNG Company Limited ("PTTGL")	- PTT, the Company's major shareholder, holds 50% of PTTGL's registered and paid-up capital. - PTTEP, PTTGL's major shareholder, holds 50% of PTTGL's registered and paid-up capital.	Income from the following services: - Income from accounting, tax, and financial operations services provided by PTTEP - Income from financial services provided by PTTEP Treasury Center Company Limited (a subsidiary of PTTEP) - Income from the Company's personnel seconded to PTTGL - Income from service charges for management's drivers provided by PTTEP Services (a subsidiary of PTTEP) - Income from office building rentals and facility service such as water, electricity, air conditioning, and parking provided by EnCo (a subsidiary of PTTEP) - Income from subleasing office areas of approximately 320 sq.m. - Income from providing facility services and others - Total income - Accounts receivable	0.87 0.19	Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.

Connected Person	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
		Rental deposit for office building/service provided by EnCo (a subsidiary of PTTEP) Accounts payable	0.02	Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
PTTGL Investment Limited ("PTTGLI")	- PTT, the Company's major shareholder, holds 50% of PTTGL's registered and paid-up capital. - PTTEP, PTTGL's major shareholder, holds 50% of PTTGL's registered and paid-up capital. - PTTGL, the major shareholder of PTTGLI, holds 100% of PTTGLI's registered and paid-up capital.	PTTEP Treasury Center Company Limited (a subsidiary of PTTEP) signed a loan contract with PTTGLI under the following conditions: - Expiration date is July 2, 2024 - Interest rates refer to the loan contract between PTTEP TC, PTT TCC, and PTTGLI dating on December 13, 2019 (The interest rates as at December 31, 2021 = 6M Libor plus 1.8% per year) - Interest income - Accrued interest - Loans outstanding	0.97 0.38 41.50	The mentioned contract follows the conditions and price setting of the normal business operations, at an arm's length basis for non-related persons or operations with the financial support of all PTTGL's shareholders proportionately.

Connected Person	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
		The Company and subsidiaries signed contracts with PTTGLI for the following services: - Accounting, Tax, and Financial Operations services provided by PTTEP - Financial services provided by PTTEP Treasury Center Company Limited - Total income - Accounts receivable	0.04 -	Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
PTT LNG Company Limited ("PTTLNG")	PTT, the Company's major shareholder, holds 100% of PTTLNG's registered and paid-up capital.	Income from office building rentals and facility service, such as water, electricity, air conditioning and parking provided by EnCo (a subsidiary of PTTEP) - Total income - Accounts receivable	0.08 0.0011	Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
		Rental deposit for office building/service provided by EnCo (a subsidiary of PTTEP) Accounts payable	0.02	Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.

Connected Person	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
PTT Oil and Retail Business Public Company Limited ("PTTOR")	PTT, the Company's major shareholder, holds 75% of PTTOR's registered and paid-up capital.	Income from the following services: - Income from sublease of office space on Floor 6, EnCo building A and Floor 18, EnCo building B (total 1,927 sq.m.) and other facility services, such as water, electricity, air conditioning, and parking - Income from providing facility services and others - Income from office building rentals and facility service, such as water, electricity, air conditioning, and parking provided by EnCo (a subsidiary of PTTEP) - Total income 2.73 - Accounts receivable 0.74		Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
		Purchase of petroleum products and related expenses - Total expenses 65.74 - Accounts payables including rental deposit for office building/service provided by EnCo 9.19		Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.

Connected Person	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
PTT Treasury Center Company Limited ("PTT TCC")	PTT, the Company's major shareholder, holds 100% of PTT TCC's registered and paid-up capital.	PTTGLI (a subsidiary of PTTEP), a borrower, signed a loan contract with PTT TCC under the following conditions: - Expiration date is July 2, 2024 - Interest rates refer to the loan contract between PTTEP TC, PTT TCC, and PTTGLI dating on December 13, 2019 (The interest rates as at December 31, 2021 = 6M Libor plus 1.8% per year) - Interest expenses - Accrued interest - Loans outstanding	0.49 0.19 20.75	The mentioned contract follows the conditions and price setting of the normal business operations, at an arm's length basis for non-related persons or operations with the financial support of all PTTGL's shareholders proportionately. (PTTGL, the major shareholder of PTTGLI, holds 100% of PTTGLI's registered and paid-up capital.)
Alpha Com Company Limited ("Alpha Com")	- PTT, the Company's major shareholder, holds 100% of PTT Global Management Company Limited ("PTTGM")'s registered and paid-up capital. - PTTGM holds 100% of Siam Management Holding Company Limited ("SMH")'s registered and paid-up capital. - SMH holds 100% of Alpha Com's registered and paid-up capital.	Income from office building rentals and facility service, such as water, electricity, air conditioning and parking provided by EnCo (a subsidiary of PTTEP) - Total income - Accounts receivable Rental deposit for office building/service provided by EnCo (a subsidiary of PTTEP) - Accounts payable	0.0028 - 0.0021	- Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations. - Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.

Connected Person	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
EVME PLUS Company Limited ("EVME Plus")	PTT, the Company's major shareholder, holds 100% of PTT Global Management Company Limited ("PTTGM")'s registered and paid-up capital.	Income from office building rentals and facility service, such as water, electricity, air conditioning and parking provided by EnCo (a subsidiary of PTTEP)		Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
	PTTGM holds 100% of Siam Management Holding Company Limited ("SMH")'s registered and paid-up capital.	- Total income - Accounts receivable	0.01 0.0038	
	SMH holds 100% of Alpha Com's registered and paid-up capital.	Deferred income from ozone service		Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
	Alpha Com holds 100% of ARUN PLUS Company Limited ("ARUN PLUS")	Accounts payable	0.0001	
	ARUN PLUS holds 100% of EVME Plus			

Remark: Please see historical data of 2020 and 2019 for a 3-year comparison from the Company's website.

9.2.2 Preconditions and Reasons for Connected Transactions

PTTEP's Audit Committee reviewed the connected transactions which were recorded during the fiscal year ending December 31, 2021, as summarized above and considered them to be indispensable, fair, and justifiable in terms of conditions and prices, and/or within the arm's length basis. The transactions were also approved by the management or the PTTEP's Board of Directors (Board) according to the Company's policy prior to execution.

9.2.3 Policy and Future Possibility of Connected Transactions

1) Policy for Connected Transactions

PTTEP treats connected transactions as normal business transactions without any intentions to transfer benefits between or among the Company and related companies, or persons. The Company strictly adheres to securities and exchange laws and regulations, including those imposed by the Capital Market Supervisory Board, the Stock Exchange of Thailand, and other related supervisory agencies, regarding connected transactions to ensure that, with reasonable business terms and conditions, and use of the market reference prices, for instance, the Company's shareholders and stakeholders will be treated equally and in their interests, in accordance with the Company's good corporate governance policy.

2) Future Possibility of Connected Transactions Potentially Leading to Conflicts of Interest

PTTEP will continue to have connected transactions with related entities in the future. Most of these transactions include normal business, office building-leasing, and supporting business transactions, which can be summarized as follows:

1) Sales of petroleum products and purchases of fuel: Since the transactions are a normal part of the Company's business and are executed under conditions and requirements as stated in the contracts, they will continue due to their necessity to the operations.

2) Lease of office buildings: Since leasing of office buildings is reasonable and necessary for the Company's business operations, the transactions will be continued.

3) Hiring of information and technology services: Since it remains reasonable and necessary for the Company to be supported with information and technology services to operate our business, the transactions will be continued.

Attachment 1: Information of the Board of Directors, Management, Controlling Persons and Corporate Secretary

1. PTTEP's Board of Directors

As of December 31, 2021, PTTEP's Board of Directors consists of 15 directors. Details of 15 current directors and 3 directors retiring from the office during the year 2021 are as below.

Mr. Krairit Euchukanonchai

Chairman and Chairman of the Independent Directors

Age : 66

Starting Date: February 1, 2021

Education

- Master of Business Administration (Banking and Finance), North Texas State University, Texas, USA
- Bachelor of Science, Chulalongkorn University

Training of Thai Institute of Directors Association

- Role of the Chairman Program (RCP)16/2007
- Director Certification Program (DCP) 59/2005

Other Training

- Certificate, Executive Program on Energy Literacy for a Sustainable Future (Class 12), Thailand Energy Academy (TEA)
- Citibank's Training Courses in many countries

% of Shareholding

None

Family Relationship among Executives

None

Working Experiences in the 5 Preceding Years

• Other Listed Companies

2015 - Present	Vice Chairman, Chairman of the Board of Executive Directors, Chairman of the Risk Oversight Committee, Krungthai Bank Public Company Limited
2014 - Present	Independent Director, Chairman of the Audit and Risk Oversight Committee, Advanced Info Service Public Company Limited
2018 - 2020	Chairman, Chairman of Independent Directors, PTT Public Company Limited

• Other Companies

2020 - Present	Chairman, INFINITAS by Krungthai Co., Ltd
1998 - Present	Chairman, V. Group Honda Cars Co., Ltd. and its Subsidiaries

• Other Organizations

Apr. 2021 - Present	Commissioner (Finance), The Securities and Exchange Commission
2020 - Present	Commissioner (Finance), Office of Insurance Commission
2017 - 2019	Chairman, Mass Rapid Transit Authority of Thailand

Mr. Achporn Charuchinda

Independent Director, Chairman of the Audit Committee, Member of the Nominating and Remuneration Committee

Age : 68**Starting Date :** January 1, 2013**Education**

- L.L.B., Faculty of Law, Thammasat University
- Thai Barrister-at-Law, Institute of Legal Education of the Thai Bar Association

Training of Thai Institute of Directors Association

None

Other Training

- Director's Briefing - Corporate Strategy beyond the Crisis, a Chairman/Board Perspective, Bain & Company, Inc.
- Law Drafting Certificate, Republic of India
- The National Defense Course (Class 46), National Defense College

% of Shareholding

None

Family Relationship among Executives

None

Working Experiences in the 5 Preceding Years**• Other Listed Companies**

2012 - 2015 Member of the Legal Committee, Thai Airways International Public Company Limited

• Other Companies

2013 - 2016 Director, Thai Smile Airways Company Limited

• Other Organizations

2020 - Present Executive Board, Life Insurance Fund

2018 - Present Advisory Board, The Crown Property Bureau

2018 - Present Special Advisory Committee, Highland Research and Development Institute (Public Organization)

2017 - Present Member, The Risk Oversight Committee, The Bank of Thailand

2015 - Present Member, Constitution Drafting Committee

2003 - Present Member of the Council of State, The Office of the Council of State

2017 - 2020 Board Member, Office of Insurance Commission

2017 - 2019 Chairman, National Reform Committee in Justice Process, National Reform Committee

2017 - 2019 Board Member in Legal, The National Economic and Social Development Board (NESDB)

2015 - 2020 Board Member, The National Economic and Social Development Board (NESDB)

2015 - 2018 Board Member, Highland Research and Development Institute (Public Organization)

2013 - 2017 Board Member, The Bank of Thailand

Apr. - Oct. 2016 Director, Thailand Tobacco Monopoly, Ministry of Finance

Admiral Tanarat Ubol

Vice Chairman of the Independent Director Committee, Chairman of the Corporate Governance and Sustainable Development Committee, Member of the Nominating and Remuneration Committee

Age : 67

Starting Date : September 1, 2014

Education

- Master of Public and Private Management, National Institute of Development Administration
- Bachelor of Science in Electrical Engineering, The National Defense Academy of Japan, Japan

Training of Thai Institute of Directors Association

- Board Matters and Trends (BMT) 4/2017
- Strategic Board Master Class (SBM) 1/2017
- Anti-Corruption: Leadership Role of the Board
- How to Develop a Risk Management Plan (HRP) 9/2016
- Risk Management Program for Corporate Leaders (RCL) 26/2016
- Boards that Make a Difference (BMD) 1/2016
- Ethical Leadership Program (ELP) 1/2015
- Director Certification Program (DCP) 204/2015

Other Training

- Director's Briefing - Corporate Strategy beyond the Crisis, a Chairman/Board Perspective, Bain & Company, Inc.
- 22nd World Petroleum Congress (WPC), Istanbul, Turkey
- Maritime Joint Force Commander Course (Admiral Level), Hawaii, USA
- Advanced Security for Senior Executive, Hawaii, USA
- National Institute for Defense Studies (Japan) Class 45
- National Defense Course (Class 51) National, Defense College

% of Shareholding

None

Family Relationship among Executives

None

Working Experiences in the 5 Preceding Years**• Other Listed Companies**

None

• Other Companies

2014 - 2015 Chairman, Bangkok Dock Company Limited

Apr. - Sep. 2015 Director, Thai Aviation Industries Company Limited

• Other Organizations

2015 - Present Royal Thai Navy Retired, Office of the Permanent Secretary for Defence

2014 - 2015 Chief of Staff, Royal Thai Navy

2014 - 2015 Chairman, Frigate Squadron Project, Royal Thai Navy

Apr. - Sep. 2015 Director, Equipment Control and Industry Development Committee Defence Industry Department, Ministry of Defence

Apr. - Sep. 2015 Deputy Chief of Joint Staff, Royal Thai Armed Forces Headquarters

Lieutenant General Nimit Suwannarat

Independent Director, Member of the Nominating and Remuneration Committee, Member of the Risk Management Committee

Age : 50

Starting Date : September 1, 2014

Education

- Master of Arts in International Relations, Chulalongkorn University
- Master of Science in Electrical Engineering (Communications and Signal Processing), University of Minnesota, Minneapolis, USA
- Bachelor of Science in Electrical Engineering, Virginia Military Institute, Lexington, Virginia, USA

Training of Thai Institute of Directors Association

- Director Certification Program (DCP) 216/2016

Other Training

- Director's Briefing - Corporate Strategy beyond the Crisis, a Chairman/Board Perspective, Bain & Company, Inc.
- Public Key Infrastructure (Certification Authority, Digital Signature) Course, Ottawa, Canada
- Electronic Commerce Course, Orlando, Florida, USA
- Computer Emergency Response Team, Carnegie Mellon, Pennsylvania, USA
- National Crisis Management Course, APCSS, Hawaii, USA
- Command and General Staff College (Class 83), Royal Thai Army
- Joint Staff Course, Joint Staff College
- Intermediate Certificate Course in Political Leadership in the New Era (Class 2), King Prajadhipok's Institute

% of Shareholding

None

Family Relationship among Executives

None

Working Experiences in the 5 Preceding Years**• Other Listed Companies**

None

• Other Companies

None

• Other Organizations

Oct. 2021 - Present	Special Advisor, Office of the Permanent Secretary for Defence
Jun. 2019 - Present	Advisor to the Prime Minister, The Prime Minister's Office
2018 - Present	Deputy Chief of Office, Office of Military Affairs Coordination to the Ministry of Foreign Affairs, Office of Policy Planning Ministry of Defence, Ministry of Defence
Apr. - Sep. 2018	Staff Officer to the Minister of Defence, Ministry of Defence
2017 - Mar. 2018	Commanding Officer, 1 st Development Regiment, Royal Thai Army
2016 - 2017	Senior Operation Officer, Defence Industry and Energy Center, Office of the Permanent Secretary for Defence
2015 - 2016	Commanding Officer of the 1 st Field Artillery Regiment, King's Guard, Royal Thai Army

Mr. Pitipan Tepartimargorn

Independent Director, Member of the Risk Management Committee, Member of the Corporate Governance and Sustainable Development Committee, Member of the Nominating and Remuneration Committee

Age : 65

Starting Date : November 1, 2015

Education

- M.A. Political Science (Public Administration), Thammasat University
- B.E. Electrical Engineering (Second Class Honors), King Mongkut's Institute of Technology Ladkrabang

Training of Thai Institute of Directors Association

- Anti-Corruption: Leadership Role of the Board
- Anti-Corruption for Executive Program (ACEP) 4/2012
- Director Certification Program (DCP) 138/2010

Other Training

- Director's Briefing - Corporate Strategy beyond the Crisis, a Chairman/Board Perspective, Bain & Company, Inc.
- Strategic Human Resource Management, Harvard University, USA
- NIDA – Wharton Executive Leadership Program, The Wharton School, University of Pennsylvania, USA
- Senior Executive Program (SEP), Sasin Graduate Institute of Business Administration
- Advance Political and Electoral Development Program (Class 3), Office of The Election Commission of Thailand
- PTT Executive Leadership Program, General Electrics, Crotonville, USA
- Capital Market Leadership Program (CMA19), Capital Market Academy (CMA)

% of Shareholding

None

Family Relationship among Executives

None

Working Experiences in the 5 Preceding Years

• Other Listed Companies

Oct. 2018 - Nov. 2019	Chairman of the Nomination and Remuneration Committee, Thai Airways International Public Company Limited
May - Jul. 2019	Chairman of the Labour Relations Committee, Thai Airways International Public Company Limited
Apr. - Nov. 2019	Member of the Corporate Plan Steering and Monitoring Committee, Thai Airways International Public Company Limited
May 2018 - Apr. 2019	Member of the Risk Management Committee, Thai Airways International Public Company Limited
Feb. 2018 - Nov. 2019	Member of the Nomination and Remuneration Committee, Thai Airways International Public Company Limited
Aug. 2018 - Apr. 2019	Member of the U-Tapao Aircraft Repair Center Project Governance and Thai Airways Business Development Project at U-Tapao Airport Sub-Committee, Thai Airways International Public Company Limited
Jan. 2018 - Apr. 2019	Member of the Human Resources Committee, Thai Airways International Public Company Limited
Dec. 2017 - Nov. 2019	Director, Thai Airways International Public Company Limited
Mar. - Aug. 2018	Member of the Recruitment of THAI's President Committee, Thai Airways International Public Company Limited
Oct. 2015 - Sep. 2016	Chief Operation Officer, Upstream Petroleum and Gas Business Group, PTT Public Company Limited

- **Other Companies**

Apr. - Oct. 2016 Chairman, PTT Energy Resources Co., Ltd.
 2014 - 2016 Director and Chairman of the Remuneration Committee, Sakari Resources Limited

- **Other Organizations**

Sep. 2019 - Present Senior Advisor of the Governing Board, Kamnoetvidya Science Academy (KVIS)
 Feb. 2018 - Present Chairman of the Executive Committee, Vidyasirimedhi Institute of Science and Technology (VISTEC)
 Jul. 2015 - Present Chairman of the Personnel Management Committee, Vidyasirimedhi Institute of Science and Technology (VISTEC)
 May 2015 - Present Council Member, Vidyasirimedhi Institute of Science and Technology (VISTEC)
 Dec. 2017 - Sep. 2019 Vice Chairman of the Governing Board, Kamnoetvidya Science Academy (KVIS)
 Oct. 2014 - May 2019 Director, The Civil Service Sub-Commission on Development of Human Resource Management (HRM), The Office of the Civil Service Commission (OCSC)

Mr. Bundhit Eua-arporn

Independent Director, Chairman of the Nominating and Remuneration Committee

Age : 56

Starting Date : August 1, 2017

Education

- Ph.D., Imperial College of Science Technology and Medicine, University of London, UK
- M.Eng., Chulalongkorn University
- B.Eng., Chulalongkorn University

Training of Thai Institute of Directors Association

- IT Governance and Cyber Resilience Program (ITG 17/2021)
- Director Certification Program (DCP) 110/2009

Other Training

- Director's Briefing - Corporate Strategy beyond the Crisis, a Chairman/Board Perspective, Bain & Company, Inc.
- The Executive Program in Energy Literacy for a Sustainable Future (Class 6), Thailand Energy Academy (TEA)
- Power of the Kingdom (Bhumipalung Phandin) (Class 3), Chulalongkorn University Executive Program
- Temasek Foundation-NUS Programme for leadership in University Management

% of Shareholding

Spouse 0.00012% (4,587 Shares)

Family Relationship among Executives

None

Working Experiences in the 5 Preceding Years**• Other Listed Companies**

Apr. 2021 - Present	Independent Director, Bangkok Bank Public Company Limited
2016 - Present	Executive Board Member, Banpu Power Public Company Limited

• Other Companies

Nov. 2018 - Present	Chairman of the Board, AI and Robotics Ventures Company Limited (ARV)

• Other Organizations

Aug. 2021 - Present	Member of Nominating Committee of the Energy Regulatory Commission
2016 - Present	President, Chulalongkorn University
Aug. - Sep. 2017	Board Member, National Reform Committee in Energy, National Reform Committee
2015 - 2016	Honorary Board Member, Thailand Institute of Scientific and Technological Research
2013 - 2016	Dean, Faculty of Engineering, Chulalongkorn University

Ms. Penchun Jarikasem

Independent Director, Chairman of the Risk Management Committee and Member of the Audit Committee

Age : 66

Starting Date : February 1, 2018

Education

- M.Sc. (Business Administration) Thammasat University
- Bachelor of Arts, Faculty of Arts, Chulalongkorn University

Training of Thai Institute of Directors Association

- IT Governance and Cyber Resilience program (ITG15/2020)
- Board Matters and Trends (BMT) 6/2018
- Risk Management Program for Corporate Leaders Class (RCL) 13/2018
- Ethical Leadership Program (ELP) 11/2018
- Role of Chairman Program (RCP) 36/2015
- Advanced Audit Committee Programs (AACP) 7/2012
- Director Certification Program (DCP) 113/2009
- Director Accreditation Program (DAP) 75/2008

Other Training

- Director's Briefing - Corporate Strategy beyond the Crisis, a Chairman/Board Perspective, Bain & Company, Inc.
- The Executive Program in Energy Literacy for a Sustainable Future (Class 6), Thailand Energy Academy (TEA)
- Power of the Kingdom (Bhumipalung Phandin) (Class 3), Chulalongkorn University Executive Program
- Senior Executive Program no.77 (SEP 77), London Business School (LBS), UK
- Capital Market Leadership Program (CMA4), Capital Market Academy (CMA)

% of Shareholding

None

Family Relationship among Executives

None

Working Experiences in the 5 Preceding Years**• Other Listed Companies**

2016 - Present	Chairperson of the Audit Committee, Osotspa Public Company Limited
2016 - Present	Independent Director, Osotspa Public Company Limited

• Other Companies

Apr. 2018 - Present	Chairman of the Audit Committee, Ritta Holdings Company Limited
Mar. 2018 - Present	Independent Director, Ritta Holdings Company Limited

• Other Organizations

Dec. 2020 - Present	Subcommittee on Finance and Accounting of the Energy Conservation Fund
May - Dec. 2020	The working group established to resolve accounting issues of the Energy Conservation Fund from fiscal years 2014 to 2018, The Energy Conservation Promotion Fund
2017 - Present	Advisory Committee for Fund Raising and Listed Company Oversight, The Securities and Exchange Commission (SEC)
Dec. 2018 - Dec. 2020	Sub-Committee on Consideration of Debt Securities, Derivatives and Structured Products, The Securities and Exchange Commission (SEC)
2018 - Sep. 2019	Chairman of the Sub-committee for Finance and Accounting State Railway of Thailand
Apr. 2018 - Sep. 2019	Director, State Railway of Thailand
2016 - Dec. 2018	Sub-Committee for Finance and Budgeting Improvement, Office of The Public Sector Development Commission (OPDC)

Mr. Patchara Anuntasilpa

Director, Member of the Nominating and Remuneration Committee

Age : 50

Starting Date : November 1, 2018

Education

- Master Degree in Business Administration (MBA), Shenandoah University, USA
- Bachelor Degree in Business Administration, Bangkok University

Training of Thai Institute of Directors Association

- Director Certification Program (DCP) 221/2016

Other Training

- The Executive Program in Energy Literacy for a Sustainable Future (Class 16), Thailand Energy Academy (TEA)
- Director's Briefing - Corporate Strategy beyond the Crisis, a Chairman/Board Perspective, Bain & Company, Inc.
- Top Executive Program, Royal Thai Police
- The Program for Junior Executives on Justice Administration, Class 23, Judicial Training Institute
- Top Executive Program in Commerce and Trade (TEPCoT), Class 11, Commerce Academy, University of the Thai Chamber of Commerce
- Super Series Program: Leadership & Effective Corporate Culture (Class 2), Institute of Research and Development for Public Enterprises (IRDP) in collaboration with Judge Business School, University of Cambridge
- Capital Market Leadership Program (CMA24), Capital Market Academy (CMA)
- Financial Analysis Program, Haas School of Business, University of California at Berkeley, USA
- Resource Management for National Defense #7, Office of the Army Comptroller
- Executive Program (Additional Program) #3, Office of the Civil Service Commission (OCSC)
- Foreign Affairs Executive Program #3, Ministry of Foreign Affairs
- Fundamentals of Public Procurement, United Nations Development Programme: UNDP, Denmark
- WTO Advanced Regional Workshop on Government Procurement for Asia and Pacific Economies, World Trade Organization: WTO, The People's Republic of China

- Executive Program for Senior Management in collaboration with Kellogg School of Management, Maxwell School of Citizenship and Public Affairs and Schulich School of Business by Fiscal Policy Research Institute Foundation

% of Shareholding

None

Family Relationship among Executives

None

Working Experiences in the 5 Preceding Years**• Other Listed Companies**

None

• Other Companies

None

• Other Organizations

Oct. 2020 - Present	Director-General, The Customs Department, Ministry of Finance
Jan. 2022 - Present	Chairman of the Board of Directors, Government Housing Bank
2019 - Jan. 2022	Chairman of the Board of Directors, Government Saving Bank
2019 - Jan.2021	Chairman of the Board of the Government Lottery, The Government Lottery Office, Ministry of Finance
2018 - Sep. 2020	Director-General, The Excise Department, Ministry of Finance
Apr. 2018 - Oct. 2019	Director, State Railway of Thailand
2015 - May 2019	Director, The Government Lottery Office, Ministry of Finance
2017 - Sep. 2018	Director-General, The Treasury Department, Ministry of Finance
2016 - 2017	Deputy Permanent Secretary of the Expense and Debt Cluster, The Expense and Debt Cluster, Ministry of Finance
2015 - 2016	Fiscal Analyst Advisory Level, The Comptroller General's Department, Ministry of Finance

Mr. Dechapiwat Na Songkhla

Independent Director and Member of the Audit Committee

Age : 60**Starting Date :** January 16, 2019**Education**

- Master of Science (National Development and Project Planning) University of Bradford, UK
- Bachelor of Science (Mathematics and Economics) University of Surrey, UK

Training of Thai Institute of Directors Association

None

Other Training

- Director's Briefing – Corporate Strategy beyond the Crisis, a Chairman/Board Perspective, Bain & Company, Inc.
- National Defense Course (Class 54), National Defense College
- Senior Justice Administration Course (Class 19), College of Justice, Office of the Judiciary
- High Level Executives Course for Strategic Management of Anti-Corruption (Class 1), Office of the National Anti-Corruption Commission
- Rule of Law for Democracy Course (Class 2), The Constitutional Court of the Kingdom of Thailand

% of Shareholding

None

Family Relationship among Executives

None

Working Experiences in the 5 Preceding Years**• Other Listed Companies**

None

• Other Companies

None

• Other Organizations

Oct. 2021 - Present	Advisor to the Prime Minister, The Prime Minister's Office
May 2021 - Present	Director, Srisavarinddhira Thai Red Cross Institute of Nursing, Thai Red Cross
Dec. 2020 - Present	Director, Judicial Administration Commission, Judicial Administration Office
2017 - Sep. 2021	Director, The Budget Bureau
2017 - Sep. 2021	Committee Member by position, The Office of the National Economic and Social Development Council
2017 - Sep. 2021	Committee Member by position, The Government Pension Fund (GPF)
2017 - Sep. 2021	Committee Member by position, Eastern Economic Corridor Policy Committee
2017 - Sep. 2021	Committee Member by position, King Prajadhipok's Institute Council
2015 - 2017	Deputy Director, The Budget Bureau

Mr. Atikom Terbsiri

Director and Member of the Risk Management Committee

Age : 59

Starting Date : October 1, 2019

Education

- Master of Business Administration (Finance & International Business), High Distinction, Armstrong University, USA
- Bachelor of Business Administration, Assumption University

Training of Thai Institute of Directors Association

- Role of the Chairman Program (RCP) 41/2017
- Risk Management Program for Corporate Leaders (RCL) 4/2016
- Director Certification Program (DCP) 125/2009
- Anti-corruption: Leadership Role of the Board

Other Training

- Director's Briefing - Corporate Strategy beyond the Crisis, a Chairman/Board Perspective, Bain & Company, Inc.
- Executive Education Program, Harvard Business School Harvard University, USA
- Advanced Security Management Program (Class 1), National Defence College
- The State, Private Sector and Political Sectors Course (Class 5), National Defence College
- Capital Market Leadership Program (CMA17), Capital Market Academy (CMA)
- The Executive Program in Energy Literacy for a Sustainable Future (Class 6), Thailand Energy Academy (TEA)
- Crisis Management Training for PTT Executives

% of Shareholding

None

Family Relationship among Executives

None

Working Experiences in the 5 Preceding Years**• Other Listed Companies**

2020 - Present	Director, Member of the Nomination and Remuneration Committee, Global Power Synergy Public Company Limited
Sep. 2019 - Present	Chief Operating Officer, Upstream Petroleum and Gas Business Group, PTT Public Company Limited
2015 - Aug. 2019	Member of the Risk Management Committee, Global Power Synergy Public Company Limited
2014 - Aug. 2019	Director, Global Power Synergy Public Company Limited
2014 - Aug. 2019	Chief Executive Officer and the President and Director (Executive), Member of the Risk Management Committee and the Secretary to the Board of Directors, Thai Oil Public Company Limited

• Other Companies

Oct. 2019 - Present	Chairman, PTTLNG Company Limited
2014 - Sep. 2019	Chairman of the Board TOP SPP Company Limited
2014 - Aug. 2019	Chairman of the Board Thailoil Marine Company Limited
2014 - Aug. 2019	Chairman of the Board Thailoil Solvent Company Limited
2014 - Aug. 2019	Chairman of the Board Thailoil Power Company Limited
2014 - Aug. 2019	Chairman of the Board LABIX Company Limited
2014 - Aug. 2019	Chairman of the Board Thai Paraxylene Company Limited

• Other Organizations

Jul. 2020 - Present	Director, The Federation of Thai Industries (Term 2020 - 2022)
May 2019 - Present	Member, Backdoor Listing Transaction Committee, Stock Exchange of Thailand
Jan. 2012 - Present	Executive Director, Thailand Energy Academy
Mar. 2018 - 2020	Director, The Federation of Thai Industries (Term 2018 - 2020)

Mrs. Angkarat Priebjivat

Independent Director, Member of the Audit Committee and Member of the Corporate Governance and Sustainable Development Committee

Age : 66

Starting Date : October 1, 2019

Education

- Ph.D. (Accounting), New York University, USA
- Master of Accounting Program, Thammasat University
- Bachelor of Business Administration (Accounting), (Second Class Honors) Thammasat University

Training of Thai Institute of Directors Association

- National Director Conference 2021 (NDC)
- DCP Series 4/2019: "How to Develop a Winning Digital Strategy"
- Audit Committee Forum 2018: Learn, unlearn and relearn - Audit Committee in the Age of Disruption
- Driving Company Success with IT Governance (ITG) 6/2017
- The Role of Chairman (RCP) 2008
- Audit Committee Program (ACP) 2007
- Director Certification Program (DCP) 2006
- Director Accreditation Program (DAP) 2005
- Monitoring the Internal Audit Function Program (MIA)
- Monitoring the System of Internal Control and Risk Management Program (MIR)
- Anti-Corruption for Executive Program

Other Training

- Management and Staff Roles for Developing Anti-corruption Compliance System, Private Sector Collective Action against Corruption
- Cyber Armor: Capital Market Board Awareness No.2, The Securities and Exchange Commission, Thailand
- Top Risk 2022 and Audit Risk-based Plan, IA Academy
- Technology Audit and Audit Innovation, IA Academy
- Director's Briefing - Corporate Strategy beyond the Crisis, a Chairman/Board Perspective, Bain & Company, Inc.
- IT Security Awareness for Top Management, ACIS Professional Center Co., Ltd
- Corporate Sustainability Development, SBDI Co., Ltd.
- PTT Group AC Forum 2020 "It's time to Reform a Next New Normal", PTT Public Company Limited
- Understanding Thailand Data Protection Law and its Unintended Consequence, ACIS Professional Center Co., Ltd. (ACIS)

- Role of the Board room: Transforming Corporate Compliance into Corruptless Society
- Understanding Cryptocurrency, Blockchain, and Digital Asset and the Opportunities in Thailand, KQ Consulting Co., Ltd.
- Capital Market Leadership Program (CMA4), Capital Market Academy (CMA)
- Certificate in International Financial Reporting Standard (IFRS), The Institute of Chartered Accountants in England and Wales (ICAEW), UK

% of Shareholding

None

Family Relationship among Executives

None

Working Experiences in the 5 Preceding Years**• Other Listed Companies**

Apr. 2021 - Present	Chairperson of Risk Oversight Committee, Member of Audit Committee, Independent Director, TISCO Financial Group Public Company Limited
2008 - Apr. 2021	Chairperson of Audit Committee, TISCO Financial Group Public Company Limited
Apr. 2021 - Present	Chairperson of Risk Oversight Committee, Member of Audit Committee, Independent Director, TISCO Bank Public Company Limited
2013 - Apr. 2021	Chairperson of Audit Committee, Independent Director, TISCO Bank Public Company Limited

• Other Companies

2016 - Present	Director, Member of Audit Committee, TSFC Securities Public Company Limited
Mar. - Aug. 2021	Independent Director, Bioscience Animal Health (Thailand) Co., Ltd.
2014 - Feb. 2021	Chairperson of Risk Management Committee, COL Public Company Limited
2008 - Feb. 2021	Chairperson of Audit Committee, Independent Director, COL Public Company Limited
2018 - 2020	Chairperson of Risk Management Committee, Member of Audit Committee, Independent Director, TOT Public Company Limited

• Other Organizations

Dec. 2020 - Present	Chairperson of Subcommittee on Finance and Accounting of the Energy Conservation Fund
Jun. - Dec. 2020	The working group to resolve accounting issues of the Energy Conservation Fund fiscal years 2014 - 2018, The Energy Conservation Fund
2012 - Present	Member of Audit Committee, Thai Public Broadcasting Service (Thai PBS)
2002 - Present	Member of Government Accounting Standards Committee, The Comptroller General's Department, Ministry of Finance
1992 - Present	Technical Advisor, Listing and Disclosure Department, Stock Exchange of Thailand
2018 - 2020	Member of Risk Management Committee, The Government Pension Fund (GPF)
2018 - 2020	Member of Technical Advisory Committee for Financial Reporting Standards and Member of Advisory Committee for Fund Raising and Listing Department, The Securities and Exchange Commission Board
2018 - 2019	Member of Finance and Accounting Subcommittee, State Railway of Thailand
2014 - 2018	Director, Member of Audit Committee, Tourism Authority of Thailand

Mr. Auttapol Rerkpiboon

Director

Age : 56

Starting Date : August 1, 2020

Education

- Master of Economics Program, National Institute of Development Administration
- Bachelor of Engineering (Civil Engineering), Chulalongkorn University
- Diploma of Petroleum Management, College of Petroleum Studies, Oxford University, UK (British Council Scholarship)

Training of Thai Institute of Directors Association

- Director Certification Program (DCP) 173/2013
- Company Secretary Program (CSP) 14/2005

Other Training

- Director's Briefing - Corporate Strategy beyond the Crisis, a Chairman/Board Perspective, Bain & Company, Inc.
- National Defence Course (Class 58), National Defence College
- Advanced Certificate Course in Politics and Governance in Democratic System for Executives, (Class 14), King Prajadhipok's Institute
- Certificate, Executive Program on Energy Literacy for a Sustainable Future (Class 12), Thailand Energy Academy (TEA)
- Capital Market Leadership Program (CMA20), Capital Market Academy (CMA)
- Executive Program on Rule of Law and Development: RoLD (Class 2), Thailand Institute of Justice: TIJ
- Executive Development Program (EDP), Class 1, Thai Listed Companies Association (TLCA)
- Rule of Law for Democracy (Class 8), College of the Constitutional Court
- NIDA-Wharton Executive Leadership Program 2009, The Wharton School of the University of Pennsylvania, USA
- PTT Executive Leadership, General Electric, GE, New York, USA

% of Shareholding

Spouse 0.00001% (500 Shares)

Family Relationship among Executives

None

Working Experiences in the 5 Preceding Years**• Other Listed Companies**

May 2020 - Present	President and Chief Executive Officer, PTT Public Company Limited
May 2020 - Present	Director, Secretary to the Board, PTT Public Company Limited
Dec. 2015 - Present	Chairman, PTT Oil and Retail Business Public Company Limited
Apr. 2018 - Jul. 2020	Director, Chairman of the Risk Management Committee/ Member of the Nomination and Remuneration Committee, Thai Oil Public Company Limited
Oct. 2017 - May 2020	Chief Operating Officer, Downstream Petroleum Business Group, (Oct. 2017 - Sep. 2018, Acting Senior Executive Vice President, Downstream Business Group Alignment), PTT Public Company Limited
Oct. 2015 - Oct. 2018	Director, Director to the Corporate Governance Committee, Director to the Risk Management Committee, PTT Global Chemical Public Company Limited
Oct. 2015 - Sep. 2017	Senior Executive Vice President - Oil Business Unit, PTT Public Company Limited

• Other Companies

Jun. 2021 - Present	Director, ARUN PLUS Company Limited
Nov. 2015 - Sep. 2017	Chairman, PTT Retail Management Company Limited

• Other Organizations

Oct. 2020 - Present	Advisory Board, The Institute of Industrial Energy
May 2020 - Present	Council of Trustees, Petroleum Institute of Thailand (PTIT)
Jun. 2020 - Present	Committee Member, Ruamchit Normkiao Foundation for Thai Youth under the patronage of H.R.H. the Queen
May 2020 - Present	Committee Member, OUR Khung BangKachao

Mar. 2020 - Present	Expert Committee of NIDA Council, National Institute of Development Administration
Sep. 2019 - Present	Honorary Advisor, National Institute of Development Administration
Nov. 2018 - Present	Honorary advisor, Thai-Laos Business Council
Jul. 2018 - Present	Committee Member, Payment Systems Committee (PSC), The Bank of Thailand
Nov. 2016 - Present	Vice President, Swimming Association Thailand
May 2018 - Jul. 2020	President, The Marketing Association of Thailand
May 2018 - Jul. 2020	Director and Treasurer, The Foundation for Educational of the Marketing Association of Thailand
Oct. 2017 - Sep. 2020	Committee Member, The Royal Automobile Association of Thailand under Royal Patronage

Mr. Veerathai Santiprabhob

Independent Director, Member of the Risk Management Committee, Member of the Corporate Governance and Sustainable Development Committee

Age : 52

Starting Date : October 15, 2020

Education

- Ph.D. in Economics, Harvard University, Cambridge, MA, USA
- A.M. in Economics, Harvard University, Cambridge, MA, USA
- Bachelor of Economics (First Class Honors), Thammasat University

Training of Thai Institute of Directors Association

- Advanced Audit Committee Program (AAP) 41/2021
- Director Certification Program (DCP) 2014
- Director Accreditation Program (DAP) 2007

Other Training

- Director's Briefing - Corporate Strategy beyond the Crisis, a Chairman/Board Perspective, Bain & Company, Inc.
- Capital Market Leadership Program (CMA4), Capital Market Academy (CMA)
- Corporate Strategy Executive Education Program, MIT Sloan School of Management, Cambridge, MA, USA

% of Shareholding

None

Family Relationship among Executives

None

Working Experiences in the 5 Preceding Years**• Other listed companies**

Apr. 2021 - Present	Independent Director and Audit Committee Member, Bangkok Dusit Medical Services Public Company Limited
Apr. 2021 - Present	Independent Director and Audit Committee Member, Univanich Palm Oil Public Company Limited

• Other Companies

None

• Other Organizations

Nov. 2021 - Present	Member of the Independent Oversight Advisory Committee, World Food Programme
Feb. 2021 - Present	Secretary-General and Chairman of the Executive Board of Mae Fah Luang Foundation under Royal Patronage
Oct. 2015 - Sep. 2020	Governor, Bank of Thailand
Oct. 2015 - Sep. 2020	Member of the Board, Office of Insurance Commission
Oct. 2015 - Sep. 2020	Member of the Board, The Securities and Exchange Commission (SEC)
Oct. 2015 - Sep. 2020	Member, National Economic and Social Development Council

Mr. Wattanapong Kurovat

Director and Member of Risk Management Committee

Age : 47

Starting Date : May 1, 2021

Education

- Master of Business Administration (MBA), Western Michigan University, USA
- Bachelor of Political Science, Thammasat University

Training of Thai Institute of Directors Association

- Director Certification Program (DCP) 288/2020
- Director Accreditation Program (DAP) 168/2020

Other Training

- The Role of the Board in IT Governance 2020
- Digital Transformation for CEO (Class 1)
- The Executive Program in Energy Literacy for Sustainable Future (Class 13), Thailand Energy Academy (TEA)
- The Civil Service Executive Development Program: Visionary and Moral Leadership, Class 86, Civil Service Training Institute, Office of the Civil Service Commission
- Chief of Staff Program, (Class 53), Joint Staff College, National Defense Studies Institute

% of Shareholding

None

Family Relationship among Executives

None

Working Experiences in the 5 Preceding Years**• Other Listed Companies**

Apr. 2021	Director and Member of the Nomination and Remuneration Committee, IRPC Public Company Limited
2019 - Mar. 2021	Director and Member of the Risk Management Committee, IRPC Public Company Limited

• Other Companies

None

• Other Organizations

2019 - Present	Director General, Energy Policy and Planning Office
2018 - 2019	Deputy Director General, Energy Policy and Planning Office
2015 - 2018	Director, Power Policy Bureau, Energy Policy and Planning Officed

Mr. Montri Rawanchaikul

Director

Age : 57

Starting Date : October 1, 2021

Education

- Master of Applied Science (Exploration Geophysics), University of New South Wales, Australia
- Bachelor of Science (Physics), Chiang Mai University

Training of Thai Institute of Directors Association

- The Corporate Governance: Regulation and Disclosure Training

Other Training

- Capital Market Leadership Program (CMA 31), Capital Market Academy (CMA)
- Leadership Development Program III (LDP III) by PTT Leadership and Learning Institute
- The Executive Program in Energy Literacy for a Sustainable Future (Class 11), Thailand Energy Academy (TEA)
- Leadership Development Program II (LDP II) by PTT Leadership and Learning Institute
- EP LEAD III Leadership Development Program by IMD

% of Shareholding

Director, Spouse 0.00154% (60,950 Shares)

Family Relationship among Executives

None

Working Experiences in the 5 Preceding Years**• Other Listed Companies**

Oct. 2021 - Present	Chief Executive Officer, PTT Exploration and Production Public Company Limited
Oct. 2021 - Present	Senior Executive Vice President, PTT, Reporting to Chief Operating Officer, Upstream Petroleum and Gas Business Group working on a secondment as Chief Executive Officer, PTT Exploration and Production Public Company Limited
Feb. - Sep. 2021	President, PTT Exploration and Production Public Company Limited
Feb. - Sep. 2021	Senior Executive Vice President, PTT, Reporting to Chief Operating Officer, Upstream Petroleum and Gas Business Group working on a secondment as President PTT Exploration and Production Public Company Limited
Oct. 2020 - Jan. 2021	President and Acting Executive Vice President, Production Asset Group, PTT Exploration and Production Public Company Limited
Oct. 2020 - Jan. 2021	Senior Executive Vice President, PTT, Reporting to Chief Operating Officer, Upstream Petroleum and Gas Business Group working on a secondment as President and acting as Executive Vice President, Production Asset Group, PTT Exploration and Production Public Company Limited
Jan. 2020 - Sep. 2020	Executive Vice President, Production Asset Group, PTT Exploration and Production Public Company Limited
Oct. 2017 - Dec. 2019	Executive Vice President, Strategy and Business Development Group, PTT Exploration and Production Public Company Limited

- Nov. 2017 - Sep. 2018 Executive Vice President, Strategy and Business Development Group and Acting Senior Vice President, New Business Unit, and additional assigned as Project Champion, Spend Smart, PTT Exploration and Production Public Company Limited
- Oct. 2016 - Sep. 2017 Acting Executive Vice President, Strategy and Business Development Group, PTT Exploration and Production Public Company Limited
- Sep. - Oct. 2016 Senior Vice President, International Asset, PTT Exploration and Production Public Company Limited
- Jul. - Aug. 2016 Senior Vice President, attached to Production Asset and Operations Support Group, PTT Exploration and Production Public Company Limited
- Jan. 2015 - Jul. 2016 Senior Vice President, Australia Asset and seconded as General Manager, PTTEP Australasia Limited
- **Other Companies**

Jan. 1998 - Aug. 2004 Project Manager and Business Unit Manager, Fugro Jason Geosystems, Netherland

Jan. 1989 - Aug. 1990 Researcher Assistant Road and Traffic Authority Sydney and Wireline Engineer, Schlumberger, Australia
 - **Other Organizations**

None

Mr. Prajya Phinyawat

Ex-Chairman

Age : 70

Education

- Ph.D. (Civil Engineering), University of Texas at Austin, USA
- M.S. (Civil Engineering), Stanford University, USA
- B.E. (Civil Engineering), Chulalongkorn University

Training of Thai Institute of Directors Association

- Board Matter and Trend (BMT) 4/2017
- The Power of Culture: From Performance Culture to Winning Culture Seminar
- Anti-Corruption: Leadership Role of the Board
- Chairman Forum: "Clean Business: What is the Chairman Role?" 1/2014
- Role of the Chairman Program (RCP) 35/2014
- Director Certification Program (DCP) 14/2002

Other Training

- Director's Briefing – Corporate Strategy beyond the Crisis, a Chairman/Board Perspective, Bain & Company, Inc.
- The 1st PLATTS-PTT Day Academic Seminar by PTT and Platts McGraw Hill Financial
- The Joint State - Private Sector course (Class 15), National Defense College
- Capital Market Leadership Program (CMA7), Capital Market Academy (CMA)
- Certificate of Energy Literacy for a Sustainable Future Program (Class 1/2012), Thailand Energy Academy (TEA)
- CERAWEEK 2019 in Houston, Texas, USA

% of Shareholding

Director 0.00038% (15,000 Shares)

Family Relationship among Executives

None

Working Experiences in the 5 Preceding Years**• Other Listed Companies**

None

• Other Companies

2011 - 2016

Chairman, PTT Asahi Chemical Company Limited

• Other Organizations

2015 - Present

Director of Council, Vidyasirimedhi Institute of Science and Technology (VISTEC)

Mr. Twarath Sutabutr

Ex-Director

Age : 52

Education

- Ph.D. Civil & Environmental Engineering, Massachusetts Institute of Technology (MIT), USA
- M.S. Soil Mechanics, Asian Institute of Technology (AIT)
- B.E. Civil Engineering, Chulalongkorn University

Training of Thai Institute of Directors Association

- Anti-Corruption: Leadership Role of the Board
- Director Certification Program (DCP) 115/2009
- Financial Statements for Directors Program (FSD) 4/2009

Other Training

- Executive Program in International Management, Stanford - National University of Singapore, Singapore
- CERAWEEK 2019, Houston, Texas, USA
- Ministry Spokesperson Program, Institute of Public Relation, The Government Public Relations Department
- Executive Program on the Rule of Law and Development (ROLD), Thailand Institute of Justice (TIJ)
- The Executive Program in Energy Literacy for a Sustainable Future (Class 10), Thailand Energy Academy (TEA)
- Capital Market Leadership Program (CMA 24), Capital Market Academy (CMA)
- International Leadership Program (ILP) by Government of the United Kingdom
- e-Government Executive Program (e-GEP) Class 5, Electronics Government Agency (Public Organization)
- Advance Management Program (AMP) INSEAD, France (Government Officials Development Scholarship, Office of the Civil Service Commission)
- Top Executive Program in Commerce and Trade (TEPCoT) Class 6, University of Thai Chamber of Commerce
- TLCA Executive Development Program (EDP) Class 9, Capital Market Academy
- The Civil Service Executive Program for Senior Civil Servants (Class 61), Office of the Civil Service Commission
- New Wave Leadership Development (Class 3), Office of the Civil Service Commission
- Energy Executive Program (Class 2), Ministry of Energy
- Infrastructure in a Market Economics, Harvard University, Cambridge USA

% of Shareholding

None

Family Relationship among Executives

None

Working Experiences in the 5 Preceding Years**• Other Listed Companies**

2014 - 2015	Director, Thai Oil Public Company Limited
Apr. - Jul. 2015	Director, PTT Public Company Limited

• Other Companies

2021 - Present	Board of Directors PTT Oil and Retail Business Public Company Limited
2021 - Present	Board of Directors Risk Management Committee PTT Oil and Retail Business Public Company Limited
2019 - Present	Board of Director, Dhanarak Asset Development Co., Ltd.

• Other Organizations

Feb. 2021 - Present	Member of The Siam Technology College Council
Mar. 2021 - Present	Committee Member, Commission of the Civil Service (Talent Management)
May 2021 - Present	Member Board of Trustees Khon Kaen University
May 2021 - Present	Regional Advisory Panel for the South East Asia Energy Transition Partnership (ETP)
May 2021 - Present	Asia EDGE Fellow, National Bureau of Asia Research
May 2021 - Present	Special Advisor Teach for Thailand
Jul. 2020 - Present	Governing Board Member, The Renewable Energy and Energy Efficiency Partnership
2019 - Present	Vice President, Chulalongkorn University Alumni Association under the Patronage of His Majesty The King
Nov. 2019 - Present	Executive Committee, Asian Institute of Technology (AIT)
Oct. 2018 - Present	Chief Inspector General, Ministry of Energy
2017 - Dec. 2019	Association President, Asian Institute of Technology (AIT)
2017 - Nov. 2019	Association President, Thai Government Scholarship Students Association, The Office of the Civil Service Commission (OCSC)
2015 - Oct. 2018	Director-General, Energy Policy and Planning Office, The Ministry of Energy
2014 - Feb. 2018	Spokesperson, Ministry of Energy

Mr. Phongsthorn Thavisin

Ex-Director

Age : 62

Education

- B.Sc. (Petroleum and Natural Gas Engineering), The Pennsylvania State University, USA

Training of Thai Institute of Directors Association

- Director Certification Program (DCP) 223/2016

Other Training

- Director's Briefing - Corporate Strategy beyond the Crisis, a Chairman/Board Perspective, Bain & Company, Inc.
- CERAWEEK 2019, Houston, Texas, USA
- Capital Market Leadership Program (CMA 27), Capital Market Academy (CMA)
- Energy Literacy Leadership Program (Class 7), Thailand Energy Academy
- Senior Executive Program (SEP-19), Sasin Graduate Institute of Business Administration of Chulalongkorn University
- Advanced Naval Studies Program (Class 40/2008), Institute of Advanced Naval Studies
- PTT Group EVP Leadership Development
- PTT Executive Leadership, General Electric, GE, New York, USA
- Breakthrough Program for Senior Executive, IMD
- The National Defense Course (2013 - 2014), Thai National Defense College

% of Shareholding

Director 0.00255% (101,037 Shares)

Family Relationship among Executives

None

Working Experiences in the 5 Preceding Years**• Other Listed Companies**

Oct. 2020 - Sep. 2021	Chief Executive Officer, PTT Exploration and Production Public Company Limited
Jan. 2019 - Sep. 2020	President and Chief Executive Officer, PTT Exploration and Production Public Company Limited
Oct. - Dec. 2018	Chief Executive Officer and Acting President, Exploration and Production, PTT Exploration and Production Public Company Limited

Oct. 2018 - Sep. 2020	Senior Executive Vice President working on a secondment as President and Chief Executive Officer of PTT Exploration and Production Public Company Limited
Nov. 2017 - Sep. 2018	President, Exploration and Production and Acting Executive Vice President Business Transformation and Organization Group, PTT Exploration and Production Public Company Limited
Jan. 2016 - Oct. 2017	Chief Operating Officer, Production Asset and Operations Support Group and acting Executive Vice President, Operations Support Group, PTT Exploration and Production Public Company Limited

• Other Companies

None

• Other Organizations

None

Criminal offense record during the past 10 years

- Being adjudged of convicting a crime or being on trial for convicting a crime
No
- Being adjudged bankrupt or a receiver is appointed
No
- Being a management in the company or partnership which is adjudged bankrupt or a receiver is appointed
No

Remark: The name and number(s) of the authorized directors who may sign to bind the Company from October 13, 2021 are Mr. Atikom Terbsiri, Mr. Wattanapong Kurovat and Mr. Patchara Anuntasilpa. Two of the above three directors can sign jointly and affix the Company's seal, or Mr. Montri Rawanchaikul, the Chief Executive Officer, can sign singly.

2. Management

As of January 1, 2022, PTTEP management team had 17 personnel as defined by the Capital Market Supervisory Board. Details are shown below.

Mr. Montri Rawanchaikul Chief Executive Officer

Please see part 1 for details

Mr. Chayong Borisuitsawat Executive Vice President, Human Resources, Corporate Affairs, and Assurance Group

Age : 54

Starting Date : December 2021 - Present

Education

- Bachelor of Engineering (Petroleum Engineering), Chulalongkorn University

% of Shareholding

0.00164% (65,096 shares)

Family Relationship among Directors and Executives

None

Working Experiences in the 5 Preceding Years

Jan. 2020 - Nov. 2021	Executive Vice President, Engineering and Development Group, PTTEP
Nov. 2018 - Dec. 2019	Executive Vice President, Business and Organization Transformation Group, PTTEP
Oct. 2018	Executive Vice President, Operations Support Group, PTTEP
Nov. 2017 - Sep. 2018	Acting Executive Vice President, Operations Support Group, PTTEP
Nov. 2017 - Jul. 2018	Project Champion, SPEND SMART Project, PTTEP
Jul. 2016 - Oct. 2017	Project Champion, SAVE to be SAFE, PTTEP

Ms. Natruedee Khositaphai Executive Vice President, Strategy and Business Development Group

Age : 56

Starting Date : January 2020 - Present

Education

- Master of Business Administration, Sasin Graduate Institute of Business Administration of Chulalongkorn University
- Bachelor of Engineering (Petroleum Engineering), Chulalongkorn University

% of Shareholding

0.00271% (107,457 shares)

Family Relationship among Directors and Executives

None

Working Experiences in the 5 Preceding Years

Jun. - Dec. 2019	Executive Vice President, Corporate Affairs and Assurance Group, PTTEP
Oct. 2018 - May 2019	Acting Executive Vice President, Corporate Affairs and Assurance Group, PTTEP
Oct. - Dec. 2018	Acting Senior Vice President, Corporate Communications and Public Affairs Division, PTTEP
Nov. 2017 - Sep. 2018	Senior Vice President, International Asset, PTTEP
Jul. - Nov. 2017	Acting Senior Vice President, International Asset, PTTEP
May 2016 - Jun. 2017	Vice President, assigned as Project Manager, SAVE to be SAFE Project, PTTEP

Mr. Suksant Ongvises

Executive Vice President, Operations Support Group

Age : 57

Starting Date : January 2020 - Present

Education :

- Bachelor of Engineering (Chemical), University of Newcastle, Australia

% of Shareholding

0.00077% (30,681 shares)

Family Relationship among Directors and Executives

None

Working Experiences in the 5 Preceding Years

Jun. - Dec. 2019	Executive Vice President, Engineering, Development and Operations Group, PTTEP
Oct. 2018 - May 2019	Acting Executive Vice President, Engineering, Development and Operations Group, PTTEP
Mar. 2017 - Oct. 2018	Senior Vice President, Engineering and Construction Division, PTTEP
Apr. - Sep. 2018	Acting Vice President, M3 Development Project, PTTEP
Jul. 2016 - Feb. 2017	Acting Senior Vice President, Engineering and Construction Division, PTTEP

Mr. Sumrid Sumneing

Executive Vice President, Finance and Accounting Group

Seconded from PTT Public Company Limited, Executive Vice President, attached to Chief Financial Officer

(The person supervising Finance and Accounting)

Age : 57

Starting Date : January 2019 - Present

Education

- Master of Business Administration, Kasetsart University
- Bachelor of Accounting, Thammasat University

Training

- Capital Market Leadership Program (CMA 29), Capital Market Academy (CMA)
- Financial & Fiscal Management Program for Senior Executive by The Comptroller General's Department 5/2018
- Executive Development Program (EDP II), Thai Listed Companies Association (TLCA)
- Director Certification Program (DCP) 180/2013
- Leadership Development Program - Center of Creative Leadership (CCL)
- Finance Executive Program (FINEX21), The Thai Institute of Banking and Finance Association

% of Shareholding

0.00033% (13,000 shares)

Family Relationship among Directors and Executives

None

Working Experiences in the 5 Preceding Years

Jun. 2016 - Dec. 2018	Executive Vice President, Corporate Finance and Strategy Group, PTT Public Company Limited
Dec. 2014 - Dec. 2015	Vice President, Financial Strategy and Policy, PTT Public Company Limited

Mr. Piya Sukhumpanumet

Executive Vice President, Geosciences, Subsurface and Exploration Group

Age : 56

Starting Date : December 2021- Present

Education

- Master of Business Administration, Sasin Graduate Institute of Business Administration of Chulalongkorn University
- Bachelor of Geology, Chulalongkorn University

% of Shareholding

0.00226% (89,916 shares)

Family Relationship among Directors and Executives

None

Working Experiences in the 5 Preceding Years

Jun. - Nov. 2021	Executive Vice President, Human Resources, Corporate Affairs, and Assurance Group, PTTEP
Oct. 2020 - May 2021	Acting Executive Vice President, Human Resources, Corporate Affairs, and Assurance Group, PTTEP
Sep. 2016 - Sep. 2020	Senior Vice President, Myanmar Asset, seconded as General Manager, PTTEP International Limited, Union of Myanmar
Jul. - Aug. 2016	Senior Vice President, Technology and Knowledge Management Division, PTTEP

Mr. Nirandorn Rojanasomsith

Executive Vice President, Production Asset Group

Age : 56

Starting Date : August 2021 - Present

Education

- Master of Sciences (Mechanical Engineering), Manhattan College, USA
- Master of Sciences (Computer), Brooklyn College, USA
- Master of Business Administration (Executive), Sasin Graduate Institute of Business Administration of Chulalongkorn University
- Bachelor of Engineering (Mechanical Engineering), Kasetsart University

% of Shareholding

Management, Spouse 0.00375% (149,041 Shares)

Family Relationship among Directors and Executives

None

Working Experiences in the 5 Preceding Years

Feb. - Jul. 2021	Acting Executive Vice President, Production Asset Group, PTTEP
Feb. 2021	Acting Senior Vice President, Thai Offshore Asset, PTTEP
Aug. 2019 - Jan. 2021	Senior Vice President, Thai Offshore Asset, Production Asset and Supply Chain Management Group, PTTEP
Nov. 2017 - Jul. 2019	Senior Vice President, Australia Asset and seconded as General Manager, PTTEP Australasia Pty Ltd, Australia

Ms. Kanita Sartwattayu

Acting Executive Vice President, Engineering and Development Group

Age : 51

Starting Date : December 2021 - Present

Education

- Master of Sciences (Engineering Management), University of Missouri-Rolla, Rolla, USA
- Bachelor of Engineering (Chemical Engineering), Chulalongkorn University

% of Shareholding

0.00152% (60,279 shares)

Family Relationship among Directors and Executives
None

Working Experiences in the 5 Preceding Years

Oct. 2019 - Nov. 2021	Senior Vice President, Development Project Division, PTTEP
Jun. - Sep. 2019	Senior Vice President assigned as Project Head of Asset Transition Project and Acting Senior Vice President, Development Project Division, PTTEP
Oct. 2018 - May 2019	Acting Vice President, M3 Development Project, PTTEP
Oct. 2018 - Jan. 2019	Senior Vice President, Development Project Division, PTTEP
Jul. 2017 - Sep. 2018	Senior Vice President, Business Development 1 Division, PTTEP
Jan. 2016 - Jun. 2017	Acting Senior Vice President, Business Development 1 Division, PTTEP

Mr. Sermsak Satchawannakul

Senior Vice President, Accounting Division

(The person is directly responsible to supervise accounting functions)

Age : 53

Starting Date : October 2020 - Present

Education

- Master of Business Administration, Thammasat University
- Bachelor of Accounting, Thammasat University

Training

- EP LEAD III Leadership Development Program by IMD
- TLCA Executive Development Program by Thai Listed Companies Association
- Financial & Fiscal Management Program for Senior Executive by The Comptroller General's Department 8/2021

Continuing Professional Development (CPD) 2021

- Key Activity Topic#1: Attended the training, seminar and KM courses to fulfil knowledge in relation to current business or professional area - Financial & Fiscal Management Program for Senior Executive by The Comptroller General's Department 8/2021 (Achieved 18 unofficial CPD Hours according to the Federation of Accounting Professions 's relief policy providing to accountants for their professional development in Year 2021)

(An Accountant with criteria specified by Department of Business Development)

% of Shareholding

0.00114% (45,215 shares)

Family Relationship among Directors and Executives
None

Working Experiences in the 5 Preceding Years

Jan. 2019 - Sep. 2020	Vice President, Financial Accounting Department, PTTEP
Jan. 2019	Acting Vice President, Office Facility Management Department, PTTEP
Jul. 2015 - Dec. 2018	Vice President, Myanmar Business Support Department, seconded as Myanmar Business Support Manager, PTTEP International Limited (Yangon Branch), Union of Myanmar

Ms. Orachon Ouiyapapun

Senior Vice President, Finance Division

Seconded from PTT Public Company Limited,
Executive Vice President, attached to Chief Financial
Officer

Age : 58

Starting Date : January 2021 - Present

Education

- Master of Business Administration, King Mongkut's Institute of Technology Ladkrabang
- Bachelor of Business Administration (Human Resource Management), Prince of Songkla University

% of Shareholding

None

Family Relationship among Directors and Executives

None

Working Experiences in the 5 Preceding Years

Oct. 2018 - Dec. 2020	Vice President, Group Financial Planning, PTT Public Company Limited
Nov. 2016 - Sep. 2018	Vice President, Treasury, PTT Public Company Limited
Jun. - Oct. 2016	Vice President, Group Financial Structure and Funding, PTT Public Company Limited
Dec. 2014 - May 2016	Vice President, Affiliates Financial Management, PTT Public Company Limited

Mr. Sakchai Sarawek

Vice President, Managerial Accounting Department

Age : 51

Starting Date : July 2020 - Present

Education

- Master of Science (Accounting Information System), Chulalongkorn University
- Bachelor of Accounting, Thammasat University

% of Shareholding

None

Family Relationship among Directors and Executives

None

Working Experiences in the 5 Preceding Years

Jul. 2018 - Jun. 2020	Vice President attached to International Asset seconded as Senior Manager, Business Support at CPOC, Malaysia
Jul. 2016 - Jun. 2018	Vice President, Accounting Policy and Solutions Department, PTTEP
Nov. 2012 - Jun. 2016	Vice President, attached to Australia Asset, seconded as Finance and Accounting Manager, PTTEP Australasia Limited, Australia

Mrs. Netsuda Pokkasorn

Vice President, Insurance Department

Age : 56**Starting Date :** August 2017 - Present**Education**

- Master of Science (Economics), University of Missouri, USA
- Bachelor of Science (Economics), Chulalongkorn University

% of Shareholding

0.00166% (66,005 shares)

Family Relationship among Directors and Executives

None

Working Experiences in the 5 Preceding Years

Feb. 2011 - Jul. 2017 Manager, Insurance, PTTEP

Mr. Anutra Bunnag

Vice President, attached to Finance Division, assigned as Managing Director, PTTEP Treasury Center

Age : 58**Starting Date :** May 2017 - Present**Education**

- Master of Science (Finance), University of Massachusetts, USA
- Bachelor of Science (Chemistry), University of Bradford, UK

% of Shareholding

None

Family Relationship among Directors and Executives

None

Working Experiences in the 5 Preceding Years

Oct. 2016 - Apr. 2017 Vice President, Treasury Department, PTTEP

Feb. 2011 - Sep. 2016 Vice President, seconded as Vice President, Corporate Administration and Finance Department, Energy Complex Co., Ltd. (EnCo)

Ms. Pratamaporn DeesrinthumVice President, Accounting Policy and Solutions
Department

Age : 49

Starting Date : April 2020 - Present

Education

- Master of Business Administration, Thammasat University
- Bachelor of Accountancy, Chulalongkorn University

% of Shareholding

0.00134% (53,249 shares)

Family Relationship among Directors and Executives

None

Working Experiences in the 5 Preceding Years

Apr. 2018 - Mar. 2020	Vice President, Managerial Accounting Department, PTTEP
Jan. - Apr. 2018	Acting Vice President, Managerial Accounting Department, PTTEP
Jun. - Dec. 2017	Senior Accountant, Thai Offshore Asset, PTTEP

Ms. Nuchanong SangkeawVice President, Capital Market and Financial Planning
Department

Age : 44

Starting Date : August 2020 - Present

Education

- Master in Professional Accounting, The University of Texas at Austin, USA
- Master of Arts (Economic Laws), Chulalongkorn University
- Bachelor of Accounting, Thammasat University

% of Shareholding

0.00012% (4,605 shares)

Family Relationship among Directors and Executives

None

Working Experiences in the 5 Preceding Years

Jan. - Jul. 2020	Acting Vice President, Capital Market and Financial Planning Department, PTTEP
Jul. - Dec. 2019	Acting Vice President, Capital and Investor Relations Department, PTTEP
Nov. 2018 - Jun. 2019	Manager, Investor Relations Section, PTTEP

Mrs. Yada Vudhivorn

Vice President, Tax Department

Age : 42

Starting Date : April 2020 - Present

Education

- Master of Laws, University of London, England
- Master of Laws, Northwestern University, USA
- Bachelor of Laws, Thammasat University

% of Shareholding

0.00013% (5,173 shares)

Family Relationship among Directors and Executives

None

Working Experiences in the 5 Preceding Years

Sep. 2019 - Mar. 2020 Acting Vice President, Tax Department, PTTEP

Aug. 2015 - Aug. 2019 Manager, Tax Planning Section, PTTEP

Mrs. Vanasanan Boonyalerdlak

Vice President, Financial Accounting Department

Seconded from PTT Public Company Limited,
Vice President, attached to Chief Financial Officer

Age : 50

Starting Date : October 2020 - Present

Education

- Master of Business Administration (Finance), Sasin Graduate Institute of Business Administration of Chulalongkorn University
- Bachelor of Accountancy, Chulalongkorn University

% of Shareholding

None

Family Relationship among Directors and Executives

None

Working Experiences in the 5 Preceding Years

Oct. 2017 - Sep. 2020 Vice President, Business Accounting and Services Management, PTT Public Company Limited

Oct. 2016 - Sep. 2017 Managerial Accounting - Gas Business Division Manager, PTT Public Company Limited

PTTEP management team had 1 personnel, as defined by the Capital Market Supervisory Board, who retired or rotated or resign during the Year 2022. Details are shown below:

Mr. Kanok Intharawijitr

Executive Vice President, attached to CEO

Age : 60

Education

- Bachelor of Science (Geology), Chiang Mai University

% of Shareholding

None

Family Relationship among Directors and Executives

None

Working Experiences in the 5 Preceding Years

Dec. 2021 Executive Vice President, attached to CEO

Oct. 2018 - Dec. 2018 Executive Vice President, Geosciences and Exploration Group

Jul. - Sep. 2018 Acting Executive Vice President, Geosciences and Exploration Group

Jan. 2016 - Jun. 2018 Senior Vice President, Geosciences and Technology Division

3. Corporate Secretary

Mrs. Maneeya Srisukhumbowornchai

Senior Vice President, Corporate Secretary Division, assigned as Company Secretary

Age : 47

Starting Date : September 2020 - Present

Education

- Master of Business Administration, Thammasat University
- Bachelor of Accountancy, Chulalongkorn University

Other Training

- Corporate Secretary Program (CSP) by the Thai Institute of Directors (IOD)
- Risk Management Program (Basic) - COSO ERM 2017
- Risk Management Program (Advance) - COSO ERM 2017
- Fundamental for Corporate Secretaries by Thai Listed Companies Association.
- The Executive Program in Anti-Corruption by Office of the National Anti-Corruption Commission

% of Shareholding

None

Family Relationship among Directors and Executives

None

Working Experiences in the 5 Preceding Years

Sep. 2019 - Present	Senior Vice President, Corporate Secretary Division, PTTEP, assigned as Company Secretary
Sep. 2019 - Aug. 2020	Acting Senior Vice President, Corporate Secretary Division, PTTEP, assigned as Company Secretary
Oct. 2018 - Jun. 2019	Acting Vice President, Accounting Policy and Solutions Department, PTTEP
May 2015 - Aug. 2019	Vice President, Tax Department, PTTEP
Jun. 2014 - Apr. 2015	Manager, Tax Compliance, PTTEP

Attachment 2: Directors of Subsidiaries and Associated Companies¹

1. List of PTTEP's Subsidiaries: As of December 31, 2021, there were 86 subsidiaries.

Name (the list only includes directors designated by the PTTEP Group)	Subsidiary														
	PTTEP AU	PTTEP AO	PTTEP AP	PTTEP AB	PTTEP AAA	PTTEP AAO	PTTEP AT	PTTEP AAS	MTA	TTI	PTTEP SBO	PTTEP SKO	PTTEP BL	PTTEP CA	PTTEP CIF
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ms. Kanita Sartwattayu			/	/	/	/	/	/							
Mr. Ryan Hartfield	/	/	/	/	/	/	/	/	/	/					
Ms. Rebecca Johnston									/	/					
Mr. Terapol Phoonsiri											/	/			
Mr. Nirandorn Rojanasomsith											/	/			
Ms. Sirlene Santos Brêtas de Noronha													/		
Ms. Krissana Juisiri														/	/
Ms. Nuchanong Sangkeaw															/

Remark: / = Director

¹ Notification of the Securities and Exchange Commission No. Kor Chor. 17/2551, Re: Determination of Definitions in Notifications Relating to Issuance and Offer for Sale of Securities.

Name (the list only includes directors designated by the PTTEP Group)	Subsidiary														
	CEEAL	PTTEP MZA1	PTTEP FH	PTTEP HK	PTTEP HKO	PTTEP MENA	PTTGLI	PTTEPO	PTTEPH	SHL	PTTEP IH	PTTEP ID	PTTEP AI	JV Marine	PTTEP NL
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Mr. Narongpol Suthapintu	/	/													
Ms. Stella Kattashi	/	/													
Mr. Sakchai Sarawek			/												
Ms. Natruedee Khositaphai				/											
Mr. Sermsak Satchawannakul				/							/				
Mr. Nirandom Rojanasomsith					/									/	
Mr. Terapol Phoonsiri					/										
Mr. Anusorn Tepjitar						/									
Ms. Pratamaporn Deesrinthum						/									
Mr. Luck Tanasomwang							/								
Mr. Krit Limbanyen								/							
Mr. Thanasit VichaiPAIRONGWONG								/							
Ms. Nuchanong Sangkeaw									/						
Mr. Nopadon Chinabutr										/					
Mr. Polasant Kullavanijaya										/					
Ms. Yada Vudhivorn											/				
Mr. Grinchai Hattagam												/			
Mr. Suksant Ongvises													/		
Mr. Soraphol Asavathevakiert														/	
Ms. Kanita Sartwattayu															/
Ms. Pariyachat Oonkhanond															/

Remark: / = Director

Name (the list only includes directors designated by the PTTEP Group)	Subsidiary														
	ATL	PTTEP SVPC	PTTEP SD	PTTEP AG	PTTEP HV	PTTEP HL	PTTEP KV	PTTEP SV	PTTEP SA	PTTEP SMD	PTTEP ML	PTTEP SS	PBC	PKC	PANG
	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Mr. Kittisak Hiranyapraphip	/						/								
Mr. Dittapon Soothi-O-Soth	/								/						
Mr. Direk Wangudomsuk		/			/	/	/	/		/	/			/	/
Mr. Grinchai Hattagam			/							/	/	/			
Mr. Peerapong Chailapo				/											
Ms. Pariyachat Oonkhanond				/											
Mr. Pongtai Wilaireungsuwan									/						
Mr. Sermsak Satchawannakul												/			
Mr. Komson Tachapanich													/		
Mr. Alfredo Coelho Ferreira dos Santos													/		
Mr. Fernando António da Silva Barata Alves													/		

Remark: / = Director

Name (the list only includes directors designated by the PTTEP Group)	Subsidiary														
	PTTEP MEP	CPOC	DGT	PTTEP NH	PTTEP BI	PTTEP NC	NATUNA	PGH	PEC	POC	PGC	PSC	PSP	APT	DGH
	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Mr. Suppakarn Thanatit	/				/										
Mr. Anusorn Tepjitar	/														
Mr. Komson Tachapanich		/						/	/	/	/	/			
Ms. Pariyachat Oonkhanond			/												
Mr. Titi Thongjen			/												/
Mr. Vitoon Chaisomboonpan										/	/				
Mr. Direk Wangudomsuk				/											
Mr. Fernando António da Silva Barata Alves									/	/	/	/	/		
Mr. Alfredo Coelho Ferreira dos Santos									/	/	/	/	/		
Mr. Chalongrut Ya-anan					/										
Ms. Krissana Juisiri						/									
Mr. Ronald Posthumus						/									
Vistra Management Services (Netherlands) B.V.						/		/							
Mrs. Yvonne Maria Wimmers-Thenus							/								
Mr. Marinus Carel Eduard van Gendt								/							
Mr. Grinchai Hattagam							/								
Mr. Chayong Borisuitsawat														/	
Ms. Kanita Sartwattayu														/	/
Mr. Soraphol Asavathevakiet		/													

Remark: / = Director

Name (the list only includes directors designated by the PTTEP Group)	Subsidiary													
	PTTEP Services	PTTEP TC	PTTEPI	PTTEP G7	PTTEPS	OEL	PTTEP BC	PTTEP EH	PTTEP ED	EP-Tech	EnCo	PTTGL	ARV	APICO KL
	61	62	63	64	65	66	67	68	69	70	71	72	73	74
Mr. Adisorn Smathimanant	/													
Ms. Pungjai Jittasevi	/													
Ms. Orachon Ouyiamapun		/					/							
Mr. Anutra Bunnag		/												
Mr. Nopadon Chinabutr			/		/									
Mr. Soraphol Asavathevakiet			/	/		/								
Mr. Nattapong Vattanajaroen					/									
Mr. Komson Tachapanich						/								
Mr. Sermsak Satchawannakul						/					/			
Ms. Yada Vudhivorn							/							
Ms. Natruedee Khositaphai								/				/		
Ms. Kanita Sartwattayu								/	/					
Mr. Kitchai Pitiwiwat									/					
Mr. Bundit Pattanasak										/				
Mr. Nopasit Chaiwanakupt										/				
Mr. Chayong Borisuitsawat											/			
Mr. Thanasit Vichaipairojwong											/			
Mr. Anusorn Wuthijaroen											/			
Ms. Ratchada Lertwanichwatana												/		
Mr. Bundhit Eua-arporn													/	
Mr. Suksant Ongvises													/	
Ms. Chanamas Sasnanand													/	
Mr. Manop Dhamsirianunt													/	
Mr. Piti Akrapipatkul														/
Ms. Worrarat Rattanawong														/

Remark: / = Director

Name (the list only includes directors designated by the PTTEP Group)	Subsidiary											
	ATi	ZeaQuest	Rovula	Varuna	Skyller	Cariva	FEV	FST	Cove	PTTEP SP	APICO	APICO KH
	75	76	77	78	79	80	81	82	83	84	85	86
Mr. Thana Slanvetpan	/	/	/	/	/	/						
Mr. Artid Jivacate	/											
Ms. Suvimol Kunariththiphol		/										
Mr. Sinthu Satawiriya			/		/	/						
Ms. Napabhas Hongsaprabhas				/								
Mr. Nopasit Chaiwanakupt							/					
Mr. Sermsak Satchawannakul							/					
Mr. Napa Medheethunyapong								/				
Mr. Saran Umpuch								/				
Mr. Narongpol Suthapintu									/			
Mr. Anutra Bunnag										/		
Mr. Nopadon Chinabutr										/		
PTTEP IH											/	
PTTEP ID											/	
APICO												/

Remark: / = Director

2. List of PTTEP's Associated Companies: As of December 31, 2021, there were 25 associated companies.

Name (the list only includes directors designated by the PTTEP Group)	Associated Company														
	MGTC	GISCO	PDO	OLNG	E2FSSO	MZ LNG 1	PTT Digital	B8/32 Partners	SPSE	Aerosky	MOZ LNG1 Holding	MOZ LNG1 Financing	AGP	POHOL	BGJV
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Mr. Komson Tachapanich			/	/							/		/	/	
Mr. Vitoon Chaisomboonpan		/													
Mr. Vitoon Chaisomboonpan*			/	/									/	/	
Mr. Suksant Ongvises							/								
Mr. Sermsak Satchawannakul								/							
Mr. Soraphol Asavathevakiet					/			/							
Mr. Dittapon Soothi-O-Soth	/														
Ms. Maylada Chayavadhanangkur*	/														
Ms. Bussaban Cheencharoen									/						
Mr. Fernando António da Silva Barata Alves*		/	/												
Mr. Alfredo Coelho Ferreira dos Santos*				/									/		
Ms. Patchara Romyanan						/									
Ms. Nuchanong Sangkeaw												/			
Mr. Sinthu Satawiriya										/					
Ms. Natruedee Khositaphai															/

Remarks / = Director

* = Alternate Director

Ten associated companies which do not have any directors from PTTEP are:

- 1) TPC, Asia Pacific Marine Service, PL9SB, PDO-S, and MOZ LNG1 Co-Financing which are governed by shareholders' meetings.
- 2) HV JOC, HL JOC, GBRS, and LAL which are governed by the Management Committee.
- 3) QLNG director will be appointed on a rotation annual basis by OLNG shareholders.

Attachment 3: Details of Head of the Internal Audit Division and Head of the Compliance Function

Details of Head of the Internal Audit Division as of January 1, 2022 are as follows:

Ms. Yaninee Wajeepratubjit

Senior Vice President, Internal Audit Division

Starting Date: January 1, 2021

Age: 52

Education:

- Master of Business Administration (Business Administration), Chulalongkorn University
- Bachelor of Accountancy (Accounting), University of the Thai Chamber of Commerce

Trainings:

- Introduction to Data-driven Organization and Big Data Analytic, PTTEP
- Smart Manufacturing 4.0 vs Internal Audit 4.0, KPMG
- Cloud Auditing & RPA Auditing, PwC
- Performance Audit, KPMG
- Management Audit, Deloitte
- The Divestment and Post Merger Integration, EY
- International Asset Audit, EY
- Overview on Laws & Regulations relating to State Enterprises, PTTEP
- Stakeholders in the Supply Chain Management, CP Training Consortium Ltd.
- EP-LEAD III Leadership Development Program, IMD
- GRC Online Training: Anti-Corruption, PTTEP

Work Experience in the Past 5 Years:

Jan. 2021 - Present	Senior Vice President, Internal Audit Division, PTTEP
Nov. 2019 - Dec. 2020	Specialist, attached to President and CEO, in charge of internal audit assignments, PTTEP
Jan. 2019 - Oct. 2019	Acting Senior Vice President, Internal Audit Division, PTTEP
Jul. 2018 - Dec. 2018	Acting Senior Vice President, Enterprise Risk Management and Internal Control Division, PTTEP
Jul. 2015 - Jun. 2018	Vice President, attached to International Asset, seconded as Senior Manager, Business Support Division, CARIGALI-PTTEPI Operating Company Sdn. Bhd. (CPOC), Malaysia, PTTEP

Details of Head of the Compliance Function as of January 1, 2022 are as follows:

Ms. Chalida Srikorakul

Vice President, Governance, Compliance, Internal Control,
and Subsidiary Management Department

Starting Date: January 26, 2021

Age: 53

Education:

- Master of Arts, Linguistics, California State University, Fresno, USA
- Bachelor of Laws, Thammasat University

Work Experience in the Past 5 Years:

Jan. 2021 - Present	Vice President, Governance, Compliance, Internal Control, and Subsidiary Management Department
Dec. 2015 - Dec. 2020	Senior Officer, Subsidiary Secretariat and Governance Department

Trainings:

- Tax Overview & Compliance
- Petroleum Fiscal System and E&P Economic
- International Tax
- Financial Modelling
- Finance for Non-Finance Management
- Corporate Governance
- Overview on LNG Markets and Contracts
- Production Sharing Contract
- Oil and Gas Contracts
- LNG Fundamentals
- Understanding of Gas Sale Agreement
- Petroleum Income Tax

Attachment 4: Asset Revaluation

- None -

Attachment 5: Good Corporate Governance and Business Ethics

The PTTEP Group values the importance of conducting business with the good corporate governance. The Company, therefore, establishes the “Good Corporate Governance and Business Ethics” of the PTTEP Group as the Company’s regulation. The details are disclosed on PTTEP website at <https://www.pttep.com/en/Aboutpttep/Publications/download.aspx?Content=4507>.

Attachment 6: Audit Committee Report

The details are disclosed under the Corporate Governance Milestones section with the “The Audit Committee Report” topic.



Financial Report

Report of Board of Directors' Responsibilities

The financial statements of PTT Exploration and Production Public Company Limited and subsidiaries being consolidated have been prepared in accordance with Thai Financial Reporting Standards under the Accounting Act B.E. 2543, being those Thai Accounting Standards issued under the Accounting Profession Act B.E. 2547 including interpretations and accounting treatment guidance announced by the Federation of Accounting Professions, as well as the financial reporting requirements of the Securities and Exchange Commission under the Securities and Exchange Act B.E. 2535.

The Company's Board of Directors are responsible for the integrity and objectivity of the financial statements of PTT Exploration and Production Public Company Limited and subsidiaries in providing reasonable assurance that the financial statements truly and fairly present financial position, results of operation and cash flows. The books and records of the Company accurately reflect all transactions to safeguard the Company's assets and the control systems are in place to prevent fraud and irregularity. The financial statements have been prepared by adoption of the appropriate accounting policy which is applied on the consistency basis and in accordance with Thai Financial Reporting Standards. In addition, significant information has been adequately disclosed in the notes to financial statements, in which the independent auditor expresses an opinion on the financial statements of PTT Exploration and Production Public Company Limited and subsidiaries in the auditor's report.

(Signed) (Mr. Krairit Euchukanonchai)

Chairman

(Signed) (Mr. Montri Rawanchaikul)

Chief Executive Officer

11 February 2022

Independent Auditor's Report

To the Shareholders of PTT Exploration and Production Public Company Limited

My opinion

In my opinion, the consolidated financial statements and the separate financial statements present fairly, in all material respects, the consolidated financial position of PTT Exploration and Production Public Company Limited (the Company) and its subsidiaries (the Group) and the separate financial position of the Company as at 31 December 2021, and its consolidated and separate financial performance and its consolidated and separate cash flows for the year then ended in accordance with Thai Financial Reporting Standards (TFRS).

What I have audited

The consolidated financial statements and the separate financial statements comprise:

- the consolidated and separate statements of financial position as at 31 December 2021;
- the consolidated and separate statements of income for the year then ended;
- the consolidated and separate statements of comprehensive income for the year then ended;
- the consolidated and separate statements of changes in equity for the year then ended;
- the consolidated and separate statements of cash flows for the year then ended; and
- the notes to the consolidated and separate financial statements, which include significant accounting policies and other explanatory information.

Basis for opinion

I conducted my audit in accordance with Thai Standards on Auditing (TSAs) and the State Audit Standards. My responsibilities under those standards are further described in the Auditor's responsibilities for the audit of the consolidated and separate financial statements section of my report. I am independent of the Group and the Company in accordance with the Code of Ethics for Professional Accountants issued by the Federation of Accounting Professions that are relevant to my audit of the consolidated and separate financial statements and the State Audit Standards as determined by the State Audit Commission, and I have fulfilled my other ethical responsibilities in accordance with these ethical requirements and the State Audit Standards. I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my opinion.

Other matter

The State Audit Standards as described in the basis for opinion section and the auditor's responsibilities for the audit of the consolidated and separate financial statements section are relevant to the particular section of audit on the financial reporting by independent auditor.

Key audit matters

Key audit matters are those matters that, in my professional judgement, were of most significance in my audit of the consolidated and separate financial statements of the current period. These matters were addressed in the context of my audit of the consolidated and separate financial statements as a whole, and in forming my opinion thereon, and I do not provide a separate opinion on these matters.

Key audit matter	How my audit addressed the key audit matter
<i>Impairment assessments of goodwill and long-lived assets</i> As at 31 December 2021, the Group has recognised goodwill net of an allowance for impairment of US Dollar 1,740.80 million, long-lived assets comprising property, plant and equipment net of an allowance for impairment of US Dollar 11,379.66 million, and exploration and evaluation assets net of allowance for impairment of US Dollar 3,121.29 million. The total net value of these assets represents 69% of the total consolidated assets. In 2021, the Group recognised an impairment loss for goodwill in the amount of US Dollar 163 million as disclosed in Note 19 and for property, plant and equipment in the amount of US Dollar 20 million as disclosed in Note 21. The management tests impairment of goodwill annually or whenever there is an indicator of impairment, and impairment of long-lived assets whenever there is an impairment indicator. The impairment test is performed at the cash generating unit (CGU) level.	I carried out the following procedures to assess management's impairment testing of goodwill and long-lived assets: • Evaluated the appropriateness of the impairment indicators that management assessed. • Evaluated the appropriateness of CGUs that the Group identified and the internal impairment assessment process. • Held discussions with the management to understand the basis of the assumptions used to estimate the cash flow and assessed whether the impairment testing process and assumptions had been applied consistently across the Group. • Challenged management's significant assumptions for impairment testing of goodwill and long-lived assets, specifically global oil price trends, petroleum reserve estimates, exploration, development and production plans, cost profiles, growth rate and discount rate. The procedures included comparing key assumptions with external sources and the approved business plan.

Key audit matter	How my audit addressed the key audit matter
Determining the CGUs' recoverable amount (the higher of value in use or fair value less costs of disposal), which includes long-lived assets and goodwill, requires significant management judgement in identifying both the relevant CGUs and valuation assumptions. These assumptions include global oil price trends, estimated petroleum reserves, exploration, development and production plans, cost profiles, growth rate and discount rate applied to the discounted cash flow forecasts. The management considered the following factors to assess whether there were any impairment indicators: • unsuccessful exploration activities during the year • the significant decrease in global oil prices • significant changes to exploration, development and production plans, and • changes to petroleum reserve estimates. I focused on the impairment assessment of these assets due to their significant values. Also, determining the recoverable amount depends on a number of assumptions and management judgements in determining the appropriate level of impairment recognition: • Goodwill of US Dollar 520.46 million from the acquisition of the exploration and production business in Thailand, US Dollar 454.10 million from the acquisition of the exploration and production	• Assessed the reasonableness of the business plan by comparing the plan for 2021 with actual results. • Assessed the discount rate by taking into account publicly available information on other companies in the industry, obtained independently by the auditor's expert, to see whether the discount rate that the management used was within an acceptable range compared to other companies in the industry. • Tested the sensitivity analysis of key assumptions in the management's model. This was done to assess which factors were sensitive to assumptions and the potential impact of a range of possible outcomes from changing in assumption. Based on the results of the procedures performed, I found that the key assumptions that the management used were reasonable and within the acceptable range. They were consistent with supporting evidence.

Key audit matter	How my audit addressed the key audit matter
business in other South East Asia and US Dollar 562.97 million from the acquisition of the exploration and production business in Africa; and Long-lived assets of US Dollar 14,500.95 million. <i>Fair value estimate from the business acquisition of Oman Block 61</i> Refer to Note 34. On 1 February 2021, the Group signed a Sale and Purchase Agreement (SPA) to acquire 20% interest in Oman Block 61 in the Sultanate Oman. The fair value of total consideration transferred on the acquisition date was US Dollar 2,368.38 million. The acquisition was completed on 23 March 2021. The management determined that this acquired participating interest was an investment in a joint operation following the definition in TFRS 11 'Joint arrangements'. The acquired participating interest has an integrated set of activities that constitute a business as defined in TFRS 3 'Business combinations'. As a result, the Group had to apply all business combination accounting principles in TFRS 3 when measuring the fair value of net identifiable assets acquired and performing the purchase price allocation (PPA). The management engaged the external valuer to appraise the fair value of net identifiable assets acquired as at the acquisition date, which was US Dollar 2,710.26 million. This mainly consisted of US Dollar 2,165.71 million in property, plant and equipment and US Dollar 332.30 million in exploration and evaluation assets. The fair value was measured as part of the PPA. The business	I carried out the following procedures to obtain sufficient evidence on the management's fair value measurement of net identifiable assets acquired as at the acquisition date. - Obtained an understanding of the terms and conditions by reading the completed SPA and all related documents. - Evaluated the competency, qualifications, experience and independence of management's experts. - Assessed the appropriateness of assumptions used to estimate the fair value of net identifiable assets acquired on the acquisition date by performing the following procedures: - Tested key assumptions applied in the fair valuation method, especially for global oil price trends, petroleum reserve estimates, exploration, development and production plans, cost profiles, growth rate and discount rate by comparing them with publicly available information, including approved project plans with reference public information. - Assessed the discount rate by taking into account publicly available information on other companies in the industry, obtained independently by the auditor's expert, to see whether the discount rate that the management used was within an acceptable range compared to other companies in the industry.

Key audit matter	How my audit addressed the key audit matter
acquisition resulted in a US Dollar 341.87 million gain on a bargain purchase. The determination of fair value of net identifiable assets acquired as at the acquisition date required significant management judgements regarding the fair valuation method, estimated operating results and projected cash flows including the application of discount rate on those projected cash flows. Key assumptions used to determine the fair value were the global oil price trends, estimated petroleum reserves, exploration, development and production plans, cost profiles, growth rate and discount rate applied to the discounted cash flow forecasts. I focused on the fair value of property, plant and equipment and exploration and evaluation assets acquired due to the significance of this transaction. Also, the external valuer applied the discounted cash flow model in determining the fair value which involved their significant assumptions and judgements when determining the possibility of cash flow forecasts and the discount rate.	- Assessed the fair valuation method under TFRS requirements. • Tested the mathematical accuracy of the fair value of net identifiable assets acquired and the gain on a bargain purchase. Based on the results of the procedures performed, I found that the method and assumptions that the management used to assess the fair value of the business acquisition and gain on a bargain purchase were appropriate.

Other information

The directors are responsible for the other information. The other information comprises the information included in the annual report, but does not include the consolidated and separate financial statements and my auditor's report thereon. The annual report is expected to be made available to me after the date of this auditor's report.

My opinion on the consolidated and separate financial statements does not cover the other information and I will not express any form of assurance conclusion thereon.

In connection with my audit of the consolidated and separate financial statements, my responsibility is to read the other information identified above when it becomes available and, in doing so, consider whether the other information is materially inconsistent with the consolidated and separate financial statements or my knowledge obtained in the audit, or otherwise appears to be materially misstated.

When I read the annual report, if I conclude that there is a material misstatement therein, I am required to communicate the matter to the audit committee.

Responsibilities of the directors for the consolidated and separate financial statements

The directors are responsible for the preparation and fair presentation of the consolidated and separate financial statements in accordance with TFRS, and for such internal control as the directors determine is necessary to enable the preparation of consolidated and separate financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated and separate financial statements, the directors are responsible for assessing the Group's and the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the directors either intend to liquidate the Group and the Company or to cease operations, or has no realistic alternative but to do so.

The audit committee assists the directors in discharging their responsibilities for overseeing the Group's and the Company's financial reporting process.

Auditor's responsibilities for the audit of the consolidated and separate financial statements

My objectives are to obtain reasonable assurance about whether the consolidated and separate financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes my opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with TSAs and the State Audit Standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated and separate financial statements.

As part of an audit in accordance with TSAs and the State Audit Standards, I exercise professional judgement and maintain professional scepticism throughout the audit. I also:

- Identify and assess the risks of material misstatement of the consolidated and separate financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for my opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Group's and the Company's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the directors.
- Conclude on the appropriateness of the directors' use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's and the Company's ability to continue as a going concern. If I conclude that a material uncertainty exists, I am required to draw attention in my auditor's report to the related disclosures in the consolidated and separate financial statements or, if such disclosures are inadequate, to modify my opinion. My conclusions are based on the audit evidence obtained up to the date of my auditor's report. However, future events or conditions may cause the Group and the Company to cease to continue as a going concern.

- Evaluate the overall presentation, structure and content of the consolidated and separate financial statements, including the disclosures, and whether the consolidated and separate financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. I am responsible for the direction, supervision and performance of the group audit. I remain solely responsible for my audit opinion.

I communicate with the audit committee regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that I identify during my audit.

I also provide the audit committee with a statement that I have complied with relevant ethical requirements and the State Audit Standards regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on my independence, and where applicable, related safeguards.

From the matters communicated with the audit committee, I determine those matters that were of most significance in the audit of the consolidated and separate financial statements of the current period and are therefore the key audit matters. I describe these matters in my auditor's report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, I determine that a matter should not be communicated in my report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

PricewaterhouseCoopers ABAS Ltd.



Amornrat Pearmpoonvatanasuk

Certified Public Accountant (Thailand) No. 4599

Bangkok

11 February 2022

Financial Statements

Statement of Financial Position

PTT Exploration and Production Public Company Limited

As at 31 December 2021

		Consolidated financial statements			
		Unit: Thousand US Dollar		Unit: Thousand Baht	
		31 December	31 December	31 December	31 December
		Notes	2021	2020	2021
Assets					
Current assets					
Cash and cash equivalents	11	2,559,189	3,704,003	85,527,810	111,257,372
Short-term investments		-	100,000	-	3,003,707
Trade and other receivables	12	1,000,303	790,763	33,430,040	23,752,181
Inventories	14	420,969	338,105	14,068,739	10,155,695
Current tax assets		59,366	56,168	1,984,024	1,687,122
Derivative assets	7	16,427	4,362	548,990	131,009
Other current assets		120,414	90,847	4,024,240	2,728,786
Total current assets		4,176,668	5,084,248	139,583,843	152,715,872
Non-current assets					
Investments in associates	16	220,880	216,866	7,381,771	6,514,000
Investments in joint ventures	16	210,235	233,344	7,026,037	7,008,969
Long-term loans to related parties	15	41,500	74,945	1,386,921	2,251,134
Property, plant and equipment	17	11,379,664	9,837,537	380,307,143	295,490,745
Right-of-use assets	18	519,711	482,778	17,368,709	14,501,235
Goodwill	19	1,740,803	1,903,803	58,177,427	57,184,639
Intangible assets		135,719	130,453	4,535,718	3,918,436
Exploration and evaluation assets	20	3,121,294	2,886,220	104,313,320	86,693,591
Deferred tax assets	22	1,317,826	1,098,682	44,041,594	33,001,186
Rights to receive reimbursement from decommissioning funds		290,546	265,789	9,710,013	7,983,520
Derivative assets	7	825	49,051	27,581	1,473,344
Other non-current financial assets		109,824	49,636	3,670,310	1,490,925
Other non-current assets	23	179,692	180,094	6,005,282	5,409,499
Total non-current assets		19,268,519	17,409,198	643,951,826	522,921,223
Total assets		23,445,187	22,493,446	783,535,669	675,637,095



(Montri Rawanchaikul)
Chief Executive Officer



(Serm Sak Satchawannakul)
Senior Vice President, Accounting Division

The notes to the consolidated and separate financial statements are an integral part of these financial statements.

Statement of Financial Position

PTT Exploration and Production Public Company Limited

As at 31 December 2021

		Consolidated financial statements			
		Unit: Thousand US Dollar		Unit: Thousand Baht	
Notes		31 December 2021	31 December 2020	31 December 2021	31 December 2020
Liabilities and equity					
Current liabilities					
Trade and other payables	24	1,096,946	893,694	36,659,830	26,843,944
Current portion of long-term liabilities	25	633,346	135,475	21,166,366	4,069,275
Income tax payable		782,837	504,785	26,162,328	15,162,267
Short-term provisions		381,144	150,218	12,737,799	4,512,101
Derivative liabilities	7	49,209	29,675	1,644,539	891,347
Other current liabilities		183,466	159,074	6,131,426	4,778,114
Total current liabilities		3,126,948	1,872,921	104,502,288	56,257,048
Non-current liabilities					
Debentures	25	2,475,802	2,830,375	82,741,041	85,016,153
Long-term loans	25	596,057	594,659	19,920,163	17,861,825
Lease liabilities	25	388,510	371,552	12,983,959	11,160,344
Deferred tax liabilities	22	1,504,258	1,445,792	50,272,138	43,427,363
Provision for employee benefits	28	205,381	265,511	6,863,853	7,975,139
Provision for decommissioning costs	26	2,458,593	3,140,385	82,165,892	94,327,939
Provision for remuneration for the renewal of petroleum production	27	120,727	103,243	4,034,672	3,101,126
Derivative liabilities	7	8,413	674	281,165	20,239
Other non-current liabilities		132,279	69,216	4,420,750	2,079,039
Total non-current liabilities		7,890,020	8,821,407	263,683,633	264,969,167
Total liabilities		11,016,968	10,694,328	368,185,921	321,226,215

The notes to the consolidated and separate financial statements are an integral part of these financial statements.

Statement of Financial Position

PTT Exploration and Production Public Company Limited

As at 31 December 2021

	Notes	Consolidated financial statements			
		Unit: Thousand US Dollar		Unit: Thousand Baht	
		31 December 2021	31 December 2020	31 December 2021	31 December 2020
Liabilities and equity (continued)					
Equity					
Share capital					
Authorised share capital					
Ordinary shares, 3,969,985,400 shares at par value of Baht 1 each	29			3,969,985	3,969,985
Issued and paid-up share capital					
Ordinary shares, 3,969,985,400 shares paid-up at Baht 1 each		150,684	150,684	3,969,985	3,969,985
Share premium		3,439,037	3,439,037	105,417,620	105,417,620
Subordinated capital debentures		156,570	156,570	4,981,992	4,981,992
Retained earnings					
Appropriated					
Legal reserve		15,048	15,048	396,999	396,999
Reserve for expansion		431,231	431,231	16,900,000	16,900,000
Unappropriated		8,306,161	7,672,902	269,709,716	248,775,592
Other components of equity		(70,512)	(66,354)	13,973,436	(26,031,308)
Total equity		12,428,219	11,799,118	415,349,748	354,410,880
Total liabilities and equity		23,445,187	22,493,446	783,535,669	675,637,095

The notes to the consolidated and separate financial statements are an integral part of these financial statements.

Statement of Financial Position

PTT Exploration and Production Public Company Limited

As at 31 December 2021

		Separate financial statements			
		Unit: Thousand US Dollar		Unit: Thousand Baht	
Notes		31 December 2021	31 December 2020	31 December 2021	31 December 2020
Assets					
Current assets					
	11	788,461	1,119,258	26,350,301	33,619,228
		-	100,000	-	3,003,707
	12	611,701	466,349	20,442,990	14,007,770
	15	527,281	78,317	17,621,666	2,352,399
	14	120,098	99,553	4,013,664	2,990,288
		16,584	10,678	554,226	320,749
	7	6,321	-	211,248	-
		45,588	39,483	1,523,537	1,185,944
Total current assets		2,116,034	1,913,638	70,717,632	57,480,085
Non-current assets					
	16	25,577	25,577	854,795	768,271
	16	2,484,787	1,082,369	83,041,306	32,511,191
	15	6,440,835	6,795,975	215,251,993	204,131,135
	17	2,146,452	2,754,254	71,734,200	82,729,723
	18	56,230	52,412	1,879,210	1,574,309
	19	75,158	75,158	2,511,758	2,257,513
		86,554	81,960	2,892,612	2,461,826
	22	789,978	769,779	26,400,973	23,121,899
	7	-	33,516	-	1,006,716
		226	235	7,552	7,073
	23	22,437	20,726	749,862	622,546
Total non-current assets		12,128,234	11,691,961	405,324,261	351,192,202
Total assets		14,244,268	13,605,599	476,041,893	408,672,287

The notes to the consolidated and separate financial statements are an integral part of these financial statements.

Statement of Financial Position

PTT Exploration and Production Public Company Limited

As at 31 December 2021

	Notes	Separate financial statements			
		Unit: Thousand US Dollar		Unit: Thousand Baht	
		31 December 2021	31 December 2020	31 December 2021	31 December 2020
Liabilities and equity					
Current liabilities					
Trade and other payables	24	359,366	301,155	12,009,981	9,045,802
Current portion of lease liabilities	25	30,801	25,617	1,029,366	769,459
Income tax payable		601,185	443,603	20,091,535	13,324,549
Short-term provisions		339,913	135,433	11,359,848	4,068,017
Derivative liabilities	7	1,284	22,656	42,923	680,518
Other current liabilities		135,220	34,067	4,519,035	1,023,265
Total current liabilities		1,467,769	962,531	49,052,688	28,911,610
Non-current liabilities					
Debentures	25	520,170	379,264	17,384,009	11,391,980
Lease liabilities	25	29,393	31,226	982,326	937,917
Provision for employee benefits	28	121,516	188,324	4,061,055	5,656,709
Provision for decommissioning costs	26	1,076,113	1,663,810	35,963,586	49,975,972
Provision for remuneration for the renewal of petroleum production	27	39,711	87,568	1,327,146	2,630,294
Derivative liabilities	7	8,413	-	281,165	-
Other non-current liabilities		28,076	29,893	938,286	897,889
Total non-current liabilities		1,823,392	2,380,085	60,937,573	71,490,761
Total liabilities		3,291,161	3,342,616	109,990,261	100,402,371

The notes to the consolidated and separate financial statements are an integral part of these financial statements.

Statement of Financial Position

PTT Exploration and Production Public Company Limited

As at 31 December 2021

	Notes	Separate financial statements			
		Unit: Thousand US Dollar		Unit: Thousand Baht	
		31 December 2021	31 December 2020	31 December 2021	31 December 2020
Liabilities and equity (continued)					
Equity					
Share capital					
Authorised share capital					
Ordinary shares, 3,969,985,400 shares					
at par value of Baht 1 each	29			3,969,985	3,969,985
Issued and paid-up share capital					
Ordinary shares, 3,969,985,400 shares					
paid-up at Baht 1 each		150,684	150,684	3,969,985	3,969,985
Share premium		3,439,037	3,439,037	105,417,620	105,417,620
Subordinated capital debentures		156,570	156,570	4,981,992	4,981,992
Retained earnings					
Appropriated					
Legal reserve		15,048	15,048	396,999	396,999
Reserve for expansion		431,231	431,231	16,900,000	16,900,000
Unappropriated		6,760,581	6,067,984	225,003,218	202,151,174
Other components of equity		(44)	2,429	9,381,818	(25,547,854)
Total equity		10,953,107	10,262,983	366,051,632	308,269,916
Total liabilities and equity		14,244,268	13,605,599	476,041,893	408,672,287

The notes to the consolidated and separate financial statements are an integral part of these financial statements.

Statement of Income

PTT Exploration and Production Public Company Limited

For the year ended 31 December 2021

	Notes	Consolidated financial statements			
		Unit: Thousand US Dollar		Unit: Thousand Baht	
		2021	2020	2021	2020
Revenues					
Revenue from sales		6,730,860	5,043,170	216,075,359	157,505,983
Revenue from pipeline transportation		93,147	92,350	2,992,712	2,894,695
Other income					
Gain on foreign exchange rates		-	26,062	-	818,411
Gain on remeasuring of financial instruments		-	99,331	-	3,212,765
Gain on debt modification		-	22,307	-	679,959
Gain from a bargain purchase		341,874	-	10,693,779	-
Interest income		16,750	36,729	531,645	1,150,128
Other income		131,594	37,012	4,337,632	1,156,212
Total revenues		7,314,225	5,356,961	234,631,127	167,418,153
Expenses					
Operating expenses		861,495	795,112	27,723,557	24,855,924
Exploration expenses		226,252	104,314	7,109,671	3,239,217
Administrative expenses		355,039	314,117	11,416,409	9,754,165
Petroleum royalties		530,215	410,154	16,994,689	12,798,161
Depreciation, depletion and amortisation		2,202,064	2,086,083	70,293,971	65,249,767
Other expenses					
Loss on foreign exchange rate		37,592	-	1,312,707	-
Loss on remeasuring of financial instruments		234,290	-	7,263,044	-
Impairment loss on assets and goodwill	19, 21	183,000	91,576	6,142,011	2,806,643
Other expenses		-	20,341	-	637,348
Finance costs		202,226	254,476	6,471,932	7,955,860
Total expenses		4,832,173	4,076,173	154,727,991	127,297,085
Share of profit of associates and joint ventures		15,174	41,636	488,626	1,307,226
Profit before income taxes		2,497,226	1,322,424	80,391,762	41,428,294
Income taxes	33	(1,286,688)	(602,880)	(41,528,167)	(18,764,283)
Profit for the year		1,210,538	719,544	38,863,595	22,664,011
		Unit: US Dollar		Unit: Baht	
		2021	2020	2021	2020
Earnings per share					
Basic earnings per share	35	0.30	0.18	9.70	5.65

The notes to the consolidated and separate financial statements are an integral part of these financial statements.

Statement of Comprehensive Income

PTT Exploration and Production Public Company Limited

For the year ended 31 December 2021

	Consolidated financial statements			
	Unit: Thousand US Dollar		Unit: Thousand Baht	
	2021	2020	2021	2020
Profit for the year	1,210,538	719,544	38,863,595	22,664,011
Other comprehensive income (expense)				
Items that will be reclassified subsequently to profit or loss				
Currency translation differences	4,222	(1,863)	5,229,507	(157,383)
Gain on remeasuring of financial assets	-	757	-	26,057
Changes in hedging reserves	578	(38,708)	17,712	(1,233,846)
Income taxes relating to changes in hedging reserves	(116)	7,742	(3,543)	246,769
Share of other comprehensive income (expense) of associates and joint ventures - net of tax	(8,494)	712	(267,960)	20,917
Total items that will be reclassified subsequently to profit or loss	(3,810)	(31,360)	4,975,716	(1,097,486)
Items that will not be reclassified subsequently to profit or loss				
Currency translation differences	-	-	35,010,773	(1,407,506)
Gain (loss) on remeasuring of financial assets	93	(767)	2,695	(26,583)
Share of other comprehensive income (expense) of associates	(580)	(44,146)	10,711	(1,394,988)
Gain from changes in actuarial assumptions of provision for employee benefits	71,723	1,431	2,360,601	44,608
Income taxes resulting from changes in actuarial assumptions of provision for employee benefits	(32,722)	-	(1,082,611)	-
Total items that will not be reclassified subsequently to profit or loss	38,514	(43,482)	36,302,169	(2,784,469)
Other comprehensive income (expense) for the year - net of tax	34,704	(74,842)	41,277,885	(3,881,955)
Total comprehensive income for the year	1,245,242	644,702	80,141,480	18,782,056

The notes to the consolidated and separate financial statements are an integral part of these financial statements.

Statement of Income

PTT Exploration and Production Public Company Limited
For the year ended 31 December 2021

	Notes	Separate financial statements			
		Unit: Thousand US Dollar		Unit: Thousand Baht	
		2021	2020	2021	2020
Revenues					
Revenue from sales		3,122,448	2,596,640	100,005,612	81,100,136
Other income					
Gain on foreign exchange rate		11,531	32,706	321,459	1,030,396
Gain on remeasuring of financial instruments		42,024	-	1,339,605	-
Interest income		372,026	256,409	11,884,659	8,025,652
Other income		160,215	143,099	5,141,000	4,463,782
Dividend income from related parties		71,814	28,930	2,369,985	921,684
Total revenues		3,780,058	3,057,784	121,062,320	95,541,650
Expenses					
Operating expenses		252,177	259,050	8,112,541	8,104,381
Exploration expenses		49	1,263	1,558	39,582
Administrative expenses		345,846	308,115	11,112,486	9,574,528
Petroleum royalties		390,306	324,645	12,500,702	10,139,606
Depreciation, depletion and amortisation		915,885	1,002,202	29,092,125	31,344,017
Other expenses					
Loss on remeasuring of financial instruments		-	8,370	-	282,622
Finance costs		54,524	84,829	1,743,042	2,647,254
Total expenses		1,958,787	1,988,474	62,562,454	62,131,990
Profit before income taxes		1,821,271	1,069,310	58,499,866	33,409,660
Income taxes	33	(545,428)	(335,326)	(17,533,527)	(10,409,785)
Profit for the year		1,275,843	733,984	40,966,339	22,999,875
		Unit: US Dollar		Unit: Baht	
		2021	2020	2021	2020
Earnings per share					
Basic earnings per share	35	0.32	0.18	10.23	5.74

The notes to the consolidated and separate financial statements are an integral part of these financial statements.

Statement of Comprehensive Income

PTT Exploration and Production Public Company Limited

For the year ended 31 December 2021

	Separate financial statements			
	Unit: Thousand US Dollar		Unit: Thousand Baht	
	2021	2020	2021	2020
Profit for the year	1,275,843	733,984	40,966,339	22,999,875
Other comprehensive income (expense)				
Items that will be reclassified subsequently to profit or loss				
Loss on remeasuring of financial assets	(5)	-	(163)	-
Changes in hedging reserves	(3,085)	(32,051)	(101,172)	(1,020,763)
Income taxes relating to remeasuring of financial assets	617	6,410	20,234	204,152
Total items that will be reclassified subsequently to profit or loss	(2,473)	(25,641)	(81,101)	(816,611)
Item that will not be reclassified subsequently to profit or loss				
Currency translation differences	-	-	35,010,773	(1,407,506)
Gain from changes in actuarial assumptions of provision for employee benefits	65,484	-	2,166,547	-
Income taxes resulting from changes in actuarial assumptions of provision for employee benefits	(32,742)	-	(1,083,273)	-
Total items that will not be reclassified subsequently to profit or loss	32,742	-	36,094,047	(1,407,506)
Other comprehensive income (expense) for the year - net of tax	30,269	(25,641)	36,012,946	(2,224,117)
Total comprehensive income for the year	1,306,112	708,343	76,979,285	20,775,758

The notes to the consolidated and separate financial statements are an integral part of these financial statements.

Statement of Changes in Equity
PTT Exploration and Production Public Company Limited
For the year ended 31 December 2021

	Consolidated financial statements										Unit: Thousand US Dollar	
	Retained earnings				Other components of equity							
	Issued and paid-up share capital	Share premium	Subordinated capital debentures	Legal reserve	Reserve for expansion	Unappropriated	Currency translation differences	Remeasuring of financial assets	Cash flow hedge reserve	Share of other comprehensive income (expense)	Total other components of equity	Total equity
Balance as at 1 January 2020	150,684	3,439,037	187,434	15,048	431,231	7,630,675	(50,315)	(757)	29,778	31,068	9,774	11,863,883
Changes in equity for the year												
Interest expenses for subordinated capital debentures	-	-	-	-	-	(10,126)	-	-	-	-	-	(10,126)
Redemption of subordinated capital debentures	-	-	(30,864)	-	-	12	-	-	-	-	-	(30,852)
Income tax for subordinated capital debentures	-	-	-	-	-	2,511	-	-	-	-	-	2,511
Dividends paid	-	-	-	-	-	(671,000)	-	-	-	-	-	(671,000)
Profit for the year	-	-	-	-	-	719,544	-	-	-	-	-	719,544
Other comprehensive income (expense) for the year	-	-	-	-	-	1,286	(1,863)	(10)	(30,966)	(43,289)	(76,128)	(74,842)
Balance as at 31 December 2020	150,684	3,439,037	156,570	15,048	431,231	7,672,902	(52,178)	(767)	(1,188)	(12,221)	(66,354)	11,793,118

The notes to the consolidated and separate financial statements are an integral part of these financial statements.

Statement of Changes in Equity
PTT Exploration and Production Public Company Limited
For the year ended 31 December 2021

		Consolidated financial statements										Unit: Thousand US Dollar	
		Other components of equity											
		Share of other comprehensive income (expense)											
		Retained earnings					Share of other comprehensive income (expense)						
		Issued and paid-up share capital	Share premium	Subordinated capital debentures	Legal reserve	Reserve for expansion	Unappropriated	Currency translation differences	Remeasuring of financial assets	Cash flow hedge reserve	Share of other comprehensive income (expense)	Total other components of equity	Total equity
Note													
	Balance as at 1 January 2021	150,684	3,439,037	156,570	15,048	431,231	7,672,902	(52,178)	(767)	(1,188)	(12,221)	(66,354)	11,799,118
	Changes in equity for the year	-	-	-	-	-	(9,138)	-	-	-	-	-	(9,138)
	Interest expenses for subordinated capital debentures	-	-	-	-	-	(1,662)	-	-	-	-	-	(1,662)
	Income tax for subordinated capital debentures	-	-	-	-	-	(605,341)	-	-	-	-	-	(605,341)
31	Dividends paid	-	-	-	-	-	1,210,538	-	-	-	-	-	1,210,538
	Profit for the year	-	-	-	-	-	-	-	-	-	-	-	-
	Other comprehensive income (expense) for the year	-	-	-	-	-	38,862	4,222	93	462	(8,935)	(4,158)	34,704
	Balance as at 31 December 2021	150,684	3,439,037	156,570	15,048	431,231	8,306,161	(47,956)	(674)	(726)	(21,156)	(70,512)	12,428,219

The notes to the consolidated and separate financial statements are an integral part of these financial statements.

Statement of Changes in Equity
PTT Exploration and Production Public Company Limited
For the year ended 31 December 2021

Consolidated financial statements													Unit: Thousand Baht
Other components of equity													
Other comprehensive income (expense)													
Share of other comprehensive income (expense) of associates and joint ventures													
Total other components of equity													
Total equity													

The notes to the consolidated and separate financial statements are an integral part of these financial statements.

Statement of Changes in Equity
PTT Exploration and Production Public Company Limited
For the year ended 31 December 2021

Consolidated financial statements														Unit: Thousand Baht
	Note	Other components of equity												
		Retained earnings							Share of other comprehensive income (expense)					
		Issued and paid-up share capital	Share premium	Subordinated capital debentures	Legal reserve	Reserve for expansion	Unappropriated	Currency translation differences	Remeasuring of financial assets	Cash flow hedge reserve	Share of associates and joint ventures	Other comprehensive expense	Total other components of equity	
Balance as at 1 January 2021		3,969,985	105,417,620	4,981,992	396,999	16,900,000	248,775,592	(25,685,622)	(26,583)	95,044	(414,147)	(26,031,308)	354,410,880	
Changes in equity for the year		-	-	-	-	-	(293,908)	-	-	-	-	-	(293,908)	
Interest expenses for subordinated capital debentures		-	-	-	-	-	(51,491)	-	-	-	-	-	(51,491)	
Income tax for subordinated capital debentures		-	-	-	-	-	(18,857,213)	-	-	-	-	-	(18,857,213)	
Dividends paid	31	-	-	-	-	-	38,863,595	-	-	-	-	-	38,863,595	
Profit for the year		-	-	-	-	-	1,273,141	-	-	-	-	-	-	
Other comprehensive income (expense) for the year		-	-	-	-	-	-	40,240,280	2,695	14,169	(252,400)	40,004,744	41,277,885	
Balance as at 31 December 2021		3,969,985	105,417,620	4,981,992	396,999	16,900,000	269,709,716	14,554,658	(23,888)	109,213	(666,547)	13,973,436	415,349,748	

The notes to the consolidated and separate financial statements are an integral part of these financial statements.

Statement of Changes in Equity
PTT Exploration and Production Public Company Limited
For the year ended 31 December 2021

	Separate financial statements										Unit: Thousand US Dollar	
	Retained earnings						Other components of equity					
							Other comprehensive income (expense)			Remeasuring of financial assets	Cash flow hedge reserve	Total other components of equity
	Issued and paid-up share capital	Share premium	Subordinated capital debentures	Legal reserve	Reserve for expansion	Unappropriated						
Balance as at 1 January 2020	150,684	3,439,037	156,570	15,048	431,231	6,012,420	-	28,070	28,070	10,233,060		
Changes in equity for the year												
Interest expenses for subordinated capital debentures	-	-	-	-	-	(9,444)	-	-	-	(9,444)		
Income tax for subordinated capital debentures	-	-	-	-	-	2,024	-	-	-	2,024		
Dividends paid	-	-	-	-	-	(671,000)	-	-	-	(671,000)		
Profit for the year	-	-	-	-	-	733,984	-	-	-	733,984		
Other comprehensive expense for the year	-	-	-	-	-	-	-	(25,641)	(25,641)	(25,641)		
Balance as at 31 December 2020	150,684	3,439,037	156,570	15,048	431,231	6,067,984	-	2,429	2,429	10,262,983		

The notes to the consolidated and separate financial statements are an integral part of these financial statements.

Statement of Changes in Equity
PTT Exploration and Production Public Company Limited
For the year ended 31 December 2021

Separate financial statements											Unit: Thousand US Dollar
	Retained earnings					Other components of equity					
	Issued and paid-up share capital	Share premium	Subordinated capital debentures	Legal reserve	Reserve for expansion	Unappropriated	Remeasuring of financial assets	Cash flow hedge reserve	Total other components of equity	Total equity	
Balance as at 1 January 2021	150,684	3,439,037	156,570	15,048	431,231	6,067,984	-	2,429	2,429	10,262,983	
Changes in equity for the year	-	-	-	-	-	(9,138)	-	-	-	(9,138)	
Interest expenses for subordinated capital debentures	-	-	-	-	-	(1,509)	-	-	-	(1,509)	
Income tax for subordinated capital debentures	-	-	-	-	-	(605,341)	-	-	-	(605,341)	
Dividends paid	-	-	-	-	-	1,275,843	-	-	-	1,275,843	
Profit for the year	-	-	-	-	-	32,742	(5)	(2,468)	(2,473)	30,269	
Other comprehensive income (expense) for the year	-	-	-	-	-	-	-	-	-	-	
Balance as at 31 December 2021	150,684	3,439,037	156,570	15,048	431,231	6,760,581	(5)	(39)	(44)	10,953,107	

The notes to the consolidated and separate financial statements are an integral part of these financial statements.

Statement of Changes in Equity
PTT Exploration and Production Public Company Limited
For the year ended 31 December 2021

	Separate financial statements										Unit: Thousand Baht
	Issued and paid-up share capital	Share premium	Subordinated capital debentures	Retained earnings			Other components of equity				
				Legal reserve	Reserve for expansion	Unappropriated	Other comprehensive income (expense)				
							Currency translation differences	Remeasuring of financial assets	Cash flow hedge reserve	Total other components of equity	
Balance as at 1 January 2020	3,969,985	105,417,620	4,981,992	396,999	16,900,000	200,224,793	(24,245,850)	-	922,113	(23,323,737)	308,567,652
Changes in equity for the year											
Interest expenses for subordinated capital debentures	-	-	-	-	-	(294,226)	-	-	-	-	(294,226)
Income tax for subordinated capital debentures	-	-	-	-	-	62,603	-	-	-	-	62,603
Dividends paid	-	-	-	-	-	(20,841,871)	-	-	-	-	(20,841,871)
Profit for the year	-	-	-	-	-	22,999,875	-	-	-	-	22,999,875
Other comprehensive expense for the year	-	-	-	-	-	-	(1,407,506)	-	(816,611)	(2,224,117)	(2,224,117)
Balance as at 31 December 2020	3,969,985	105,417,620	4,981,992	396,999	16,900,000	202,151,174	(25,653,356)	-	105,502	(25,547,854)	308,269,916

The notes to the consolidated and separate financial statements are an integral part of these financial statements.

Statement of Changes in Equity
PTT Exploration and Production Public Company Limited
For the year ended 31 December 2021

	Separate financial statements										Unit: Thousand Baht	
	Note	Issued and paid-up share capital	Share premium	Subordinated capital debentures	Retained earnings			Other components of equity				
					Legal reserve	Reserve for expansion	Unappropriated	Other comprehensive income (expense)				
								Currency translation differences	Remeasuring of financial assets	Cash flow hedge reserve		Total other components of equity
Balance as at 1 January 2021		3,969,985	105,417,620	4,981,992	396,999	16,900,000	202,151,174	(25,653,356)	-	105,502	(25,547,854)	308,269,916
Changes in equity for the year												
Interest expenses for subordinated capital debentures		-	-	-	-	-	(293,908)	-	-	-	-	(293,908)
Income tax for subordinated capital debentures		-	-	-	-	-	(46,448)	-	-	-	-	(46,448)
Dividends paid	31	-	-	-	-	-	(18,857,213)	-	-	-	-	(18,857,213)
Profit for the year		-	-	-	-	-	40,966,339	-	-	-	-	40,966,339
Other comprehensive income (expense) for the year		-	-	-	-	-	1,083,274	35,010,773	(163)	(80,938)	34,929,672	36,012,946
Balance as at 31 December 2021		3,969,985	105,417,620	4,981,992	396,999	16,900,000	225,003,218	9,357,417	(163)	24,564	9,381,818	366,051,632

The notes to the consolidated and separate financial statements are an integral part of these financial statements.

Statement of Cash Flows

PTT Exploration and Production Public Company Limited

For the year ended 31 December 2021

	Consolidated financial statements			
	Unit: Thousand US Dollar		Unit: Thousand Baht	
	2021	2020	2021	2020
Cash flows from operating activities				
Profit before income taxes	2,497,226	1,322,424	80,391,762	41,428,294
Adjustments for:				
Share of profit of associates and joint ventures	(15,174)	(41,636)	(488,626)	(1,307,226)
Depreciation, depletion and amortisation	2,202,064	2,086,083	70,293,971	65,249,767
Allowance for impairment loss on assets and goodwill	183,000	91,576	6,142,011	2,806,643
Allowance (reversal) for decrease in value of inventories to net realisable value	(882)	474	(27,657)	14,824
Write-off of exploration expenses	214,928	62,140	6,763,906	1,943,212
Other amortised expenses	10,976	10,208	350,393	319,349
Loss on disposal of assets	2,256	24,215	77,913	757,335
Income recognised from deferred income	(3,104)	(2,550)	(99,091)	(79,755)
(Gain) loss on remeasuring financial instruments	(15,718)	43,649	(849,979)	1,327,977
(Gain) loss on foreign exchange rates	9,132	(10,229)	291,535	(319,920)
Interest income lower than interest expenses	177,752	212,035	5,693,537	6,631,560
Gain from a bargain purchase	(341,874)	-	(10,693,779)	-
Gain on debt modification	-	(22,307)	-	(679,959)
Other Income	(81,276)	-	(2,727,874)	-
Other expenses	19,176	37,371	607,935	1,169,989
Cash flows before changes in working capital	4,858,482	3,813,453	155,725,957	119,262,090
Changes in working capital				
Trade and other receivables	(229,783)	178,745	(7,335,644)	5,590,373
Inventories	(60,357)	(29,761)	(1,926,848)	(930,782)
Other current financial assets	(1,425)	200,546	(45,499)	6,272,218
Other current assets	(40,122)	6,258	(1,280,852)	195,737
Rights to receive reimbursement from decommissioning funds	(28,656)	(20,987)	(914,816)	(656,390)
Other non-current financial assets	(53,562)	(27,145)	(1,709,928)	(848,981)
Other non-current assets	(5,935)	1,933	(189,468)	60,446
Trade and other payables	124,016	(110,972)	3,959,105	(3,470,724)
Other current liabilities	(20,858)	24,173	(665,861)	756,043
Provisions	(136,019)	(125,779)	(4,342,316)	(3,933,821)
Other non-current liabilities	4,755	(53,139)	151,813	(1,661,964)
Net cash provided by operating activities	4,410,536	3,857,325	141,425,643	120,634,245
Interest received from bank deposits	6,855	24,371	218,854	762,215
Cash paid for income taxes	(989,083)	(1,110,196)	(31,575,682)	(34,722,169)
Net cash flows provided by operating activities	3,428,308	2,771,500	110,068,815	86,674,291

The notes to the consolidated and separate financial statements are an integral part of these financial statements.

Statement of Cash Flows

PTT Exploration and Production Public Company Limited
For the year ended 31 December 2021

	Consolidated financial statements			
	Unit: Thousand US Dollar		Unit: Thousand Baht	
	2021	2020	2021	2020
Cash flows from investing activities				
Cash paid for short-term investments	-	(100,000)	-	(3,127,571)
Cash received from investing in short-term investments	100,000	200,000	3,192,420	6,255,141
Cash received from long-term loans to related parties	33,170	11,086	1,058,929	346,712
Dividend received from related parties	40,746	26,807	1,300,791	838,403
Cash paid for business acquisition	(2,299,492)	-	(73,409,451)	-
Net cash received from asset acquisition	11,968	-	382,071	-
Cash paid for contingent considerations				
from participating interest acquisition in a joint venture	(54,670)	-	(1,745,296)	-
Cash received from investment in joint venture	-	393	-	12,301
Cash paid for investment in associate and joint ventures	(15,506)	(3,138)	(495,014)	(98,150)
Cash received from lease receivables	374	378	11,945	11,814
Interest received from short-term investments	1,850	5,842	59,060	182,728
Interest received from loans to related parties	1,010	2,277	32,243	71,221
Increase in property, plant and equipment	(1,512,174)	(1,093,140)	(48,274,943)	(34,188,714)
Increase in intangible assets	(29,067)	(28,466)	(927,946)	(890,307)
Increase in exploration and evaluation assets	(131,574)	(93,651)	(4,200,412)	(2,929,002)
Net cash flows used in investing activities	(3,853,365)	(1,071,612)	(123,015,603)	(33,515,424)
Cash flows from financing activities				
Cash received from short-term loans	200,000	-	6,384,840	-
Cash paid for repayment of short-term loans	(200,000)	-	(6,384,840)	-
Cash paid for repayment of debentures	-	(730,443)	-	(22,845,133)
Cash received from issuance of debentures	179,960	850,000	5,745,095	26,584,349
Cash paid for finance cost from issuance of debentures	(270)	(9,945)	(8,617)	(311,037)
Cash paid for lease liabilities	(128,482)	(96,362)	(4,101,696)	(3,013,790)
Interest paid	(133,914)	(147,594)	(4,275,080)	(4,616,110)
Cash paid for redemption of subordinated				
capital debentures	-	(30,852)	-	(964,918)
Interest paid for subordinated capital debentures	(9,138)	(10,126)	(291,719)	(316,686)
Net cash received from financial derivative contracts	1,826	-	58,280	-
Dividends paid	(605,341)	(671,000)	(19,325,041)	(20,986,003)
Net cash flows used in financing activities	(695,359)	(846,322)	(22,198,778)	(26,469,328)

The notes to the consolidated and separate financial statements are an integral part of these financial statements.

Statement of Cash Flows

PTT Exploration and Production Public Company Limited
For the year ended 31 December 2021

	Consolidated financial statements			
	Unit: Thousand US Dollar		Unit: Thousand Baht	
	2021	2020	2021	2020
Net increase (decrease) in cash and cash equivalents	(1,120,416)	853,566	(35,145,566)	26,689,539
Cash and cash equivalents at the beginning of the year	3,704,003	2,822,897	111,257,372	85,121,635
Adjustment for the impact of exchange rate changes	(24,398)	27,540	9,416,004	(553,802)
Cash and cash equivalents at the end of the year	2,559,189	3,704,003	85,527,810	111,257,372
Significant non-cash transactions				
Outstanding payable from purchases of assets	387,058	346,979	12,356,505	10,852,020
Changes in right-of-use assets	187,153	98,367	5,974,704	3,076,504

The notes to the consolidated and separate financial statements are an integral part of these financial statements.

Statement of Cash Flows

PTT Exploration and Production Public Company Limited

For the year ended 31 December 2021

	Separate financial statements			
	Unit: Thousand US Dollar		Unit: Thousand Baht	
	2021	2020	2021	2020
Cash flows from operating activities				
Profit before income taxes	1,821,271	1,069,310	58,499,866	33,409,660
Adjustments for:				
Depreciation, depletion and amortisation	915,885	1,002,202	29,092,125	31,344,017
Write-off of exploration expenses	-	1,191	-	37,358
Other amortised expenses	2,524	2,596	80,735	81,152
Loss on disposal of assets	3,400	14,059	112,377	447,269
Income recognised from deferred income	(1,759)	(1,658)	(56,165)	(51,848)
(Gain) loss on remeasuring financial instruments	(29,514)	10,716	(881,452)	361,266
Dividend income from related parties	(71,814)	(28,930)	(2,369,985)	(921,684)
Gain on foreign exchange rates	(24,873)	(2,415)	(794,063)	(75,537)
Interest income higher than interest expenses	(317,744)	(172,041)	(10,149,495)	(5,392,782)
Other expenses	26,104	15,109	846,137	472,548
Cash flows before changes in working capital	2,323,480	1,910,139	74,380,080	59,711,419
Changes in working capital				
Trade and other receivables	(59,242)	57,323	(1,891,254)	1,792,811
Inventories	(15,173)	(7,208)	(484,384)	(225,451)
Other current assets	(9,258)	27,215	(295,559)	851,152
Other non-current assets	(1,686)	53	(53,836)	1,667
Trade and other payables	44,747	(40,430)	1,428,520	(1,264,479)
Other current liabilities	1,724	(19,882)	55,042	(621,815)
Provisions	(118,870)	(110,011)	(3,794,832)	(3,440,683)
Other non-current liabilities	(6,887)	(3,736)	(219,857)	(116,832)
Net cash provided by operating activities	2,158,835	1,813,463	69,123,920	56,687,789
Interest received from bank deposits	1,679	8,685	53,615	271,631
Cash paid for income taxes	(445,772)	(693,140)	(14,230,928)	(21,678,437)
Net cash flows provided by operating activities	1,714,742	1,129,008	54,946,607	35,280,983

The notes to the consolidated and separate financial statements are an integral part of these financial statements.

Statement of Cash Flows

PTT Exploration and Production Public Company Limited

For the year ended 31 December 2021

	Separate financial statements			
	Unit: Thousand US Dollar		Unit: Thousand Baht	
	2021	2020	2021	2020
Cash flows from investing activities				
Cash paid for short-term investments	-	(100,000)	-	(3,127,570)
Cash received from investing in short-term investments	100,000	200,000	3,192,420	6,255,141
(Increase) decrease in short-term loans to related party	(443,086)	299,588	(14,145,169)	9,369,838
Cash received from long-term loans to related parties	354,865	105,121	11,328,769	3,287,731
Cash paid for long-term loans to related parties	-	(489,414)	-	(15,306,766)
Net cash received from asset acquisition	11,968	-	382,071	-
Cash paid for investment in subsidiaries	(1,402,418)	(157,966)	(44,771,065)	(4,940,490)
Dividend received from related parties	71,814	28,930	2,292,614	904,820
Cash received from lease receivables	374	378	11,945	11,814
Interest received from short-term investments	1,850	5,843	59,060	182,728
Interest received from loans to related parties	190,841	420,941	6,092,435	13,165,217
Increase in property, plant and equipment	(424,426)	(295,479)	(13,549,448)	(9,241,311)
Increase in intangible assets	(21,544)	(22,084)	(687,767)	(690,703)
Net cash flows used in investing activities	(1,559,762)	(4,142)	(49,794,135)	(129,551)
Cash flows from financing activities				
Cash received from issuance of debentures	179,960	-	5,745,095	-
Cash paid for finance cost from issuance of debentures	(270)	-	(8,617)	-
Cash paid for lease liabilities	(30,443)	(22,251)	(971,858)	(695,909)
Interest paid	(19,560)	(21,388)	(624,431)	(668,937)
Interest paid for subordinated capital debenture	(9,138)	(9,444)	(291,719)	(295,356)
Net cash received from financial derivative contracts	1,826	-	58,280	-
Dividends paid	(605,341)	(671,000)	(19,325,041)	(20,986,003)
Net cash flows used in financing activities	(482,966)	(724,083)	(15,418,291)	(22,646,205)
Net increase (decrease) in cash and cash equivalents	(327,986)	400,783	(10,265,819)	12,505,227
Cash and cash equivalents at the beginning of the year	1,119,258	715,768	33,619,228	21,583,266
Adjustment for the impact of exchange rate changes	(2,811)	2,707	2,996,892	(469,265)
Cash and cash equivalents at the end of the year	788,461	1,119,258	26,350,301	33,619,228
Significant non-cash transactions				
Outstanding payable from purchases of assets	68,125	61,499	2,174,837	1,923,427
Changes in right-of-use assets	36,659	47,375	1,170,296	1,481,686

The notes to the consolidated and separate financial statements are an integral part of these financial statements.

Notes to the Consolidated and Separate Financial Statements

PTT Exploration and Production Public Company Limited
For the year ended 31 December 2021

1 General information

PTT Exploration and Production Public Company Limited (the Company) is registered as a company in Thailand and listed on the Stock Exchange of Thailand. The address of its registered office is 555/1 Energy Complex Building A, 6th and 19th - 36th Floor, Vibhavadi-Rangsit Road, Chatuchak, Bangkok 10900.

For reporting purposes, the Company and its subsidiaries are together referred to as the Group.

The principal business operations of the Group are exploration and production of petroleum in Thailand and overseas, and related business associated with the Group's strategy.

These consolidated and separate financial statements were authorised for issue by the Board of Directors on 11 February 2022.

2 Significant events during the current period

On 30 July 2021, 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. As a result, the Company recognised all revenue, costs and operating expenses from the petroleum produced from such drillings.

On 3 December 2021, PTTEP MENA Limited (PTTEP MENA), a subsidiary of the Group, has signed Farm-Out Agreement (FOA) to acquire 25% stake in the Concession Area C onshore the Emirate of Sharjah from Eni Sharjah B.V. (ENI). The acquisition will be completed after PTTEP MENA fulfills all conditions in the said agreement and obtaining all necessary government approvals.

3 Basis of preparation

The consolidated and separate financial statements have been prepared in accordance with Thai Financial Reporting Standards (TFRS) and the financial reporting requirements issued under the Securities and Exchange Act.

The Company's management has determined US Dollar as the functional currency of the Company and presents the consolidated and separate financial statements in US Dollar. However, the Stock Exchange of Thailand and the Department of Business Development require the Company to present its consolidated and separate financial statements in Thai Baht, so the Company also presents its financial statements in Thai Baht by translating from US Dollar.

Where the Group has entered into joint interest operations in the Concession or the Production Sharing Contract with other parties to participate in exploration and production of petroleum businesses, the Group records its share of expenses, assets and liabilities incurred in accordance with the Statements of Expenditures prepared by the operators of the Concession or the Production Sharing Contract. The Statements of Expenditures have been audited by other independent auditors and the joint venture committee on a regular basis.

The consolidated and separate financial statements have been prepared under the historical cost convention except as disclosed in the accounting policies.

The preparation of financial statements in conformity with TFRS requires the Group's management to use certain critical accounting estimates and to exercise its judgement in applying the Group's accounting policies. The areas involving a higher degree of judgement or complexity, or areas that are more likely to be materially adjusted due to changes in estimates and assumptions are disclosed in Note 8.

Where necessary, comparative figures have been reclassified to conform with changes in presentation in the current year.

An English version of the consolidated and separate financial statements have been prepared from the statutory financial statements that are in the Thai language. In the event of a conflict or a difference in interpretation between the two languages, the Thai language statutory financial statements shall prevail.

4 Amended financial reporting standards

4.1 Amended financial reporting standards that are effective for accounting period beginning on or after 1 January 2021 and related to the Group

- a) **Revised Conceptual Framework for Financial Reporting** added the following key principals and guidance:
- Measurement basis, including factors in considering difference measurement basis
 - Presentation and disclosure, including classification of income and expenses in other comprehensive income
 - Definition of a reporting entity, which may not be necessarily a legal entity, or a portion of an entity, or comprise more than one entity, and
 - Derecognition of assets and liabilities.

The amendment also includes the revision to the definition and the basis in grouping of an asset and liability in the financial statements. In addition, it clarifies the objectivity of the management and procuring the economic resources of the entity, conservatism principle and uncertainty of measurement basis in the financial reporting.

- b) **Amendment to TFRS 3, Business combinations** Since 1 January 2021, the Group adopted the amendment to TFRS 3 - Business Combinations, which amended definition of business by requiring a business acquisition to include, at least an input and a substantive process that together significantly contribute to the ability to create outputs. The definition of the term 'outputs' is amended to focus on goods and services provided to customers, and it excludes returns in the form of lower costs. In addition, the standard sets out an optional test (the concentration test) for a simplified assessment of whether an acquired set of activities and assets is not a business.
- c) **Amendment to TFRS 9, Financial instruments and TFRS 7, Financial instruments: disclosures** amended to provide a relief from applying specific hedge accounting requirements to the uncertainty arising from interest rate benchmark reform such as Interbank offer rates - IBORs. The amendment also requires the disclosure of hedging relationships directly affected by the uncertainty.
- d) **Amendment to TAS 1, Presentation of financial statements and TAS 8, Accounting policies, changes in accounting estimates and errors** amended the definition of materiality and make it consistent on both the Thai Financial Reporting Standards and the Conceptual Framework for Financial Reporting. It also

clarified when information is material and incorporates some of the guidance in TAS 1 about immaterial information.

- e) **Amendment to TFRS 16, Leases** amended to provide a practical expedient where lessees are exempted from having to consider individual lease contracts when determining whether rent concessions occurring as a direct consequence of the COVID-19 pandemic are lease modifications. It applies to rent concessions that reduce the lease payments due by 30 June 2022.

4.2 Amended financial reporting standards that are effective for accounting period beginning on or after 1 January 2022 and related to the Group

The Group did not early adopt the amended financial reporting standards.

- a) **Interest rate benchmark (IBOR) reform - phase 2, amendments to TFRS 9, TFRS 7 and TFRS 16** provide the relief measures addressing issues that might affect the financial reporting during the reform, including the additional disclosures about IBOR reform. Key relief measures of the phase 2 amendments are as follows:

- When changing the basis for determining contractual cash flows for financial assets and financial liabilities (including lease liabilities), changes that are necessary as a direct result of the IBOR reform and which are considered economically equivalent, will not result in an immediate gain or loss in the statement of income.
- Most hedge accounting relationships that are directly affected by the IBOR reform will be allowed to continue. However, the entity is still required to recognise the hedged ineffectiveness portion.

5 Accounting policies

The principal accounting policies applied in the preparation of these consolidated and separate financial statements are set out below.

5.1 Principles of consolidation accounting

- a) **Subsidiaries**

Subsidiaries are all entities over which the Group has control. The Group controls an entity when the Group is exposed to, or has rights to, variable returns from its involvement with the entity and has the

ability to affect those returns through its power over the entity. Subsidiaries are consolidated from the date on which control is transferred to the Group until the date that control ceases.

In the separate financial statements, investments in subsidiaries are accounted for using cost method less impairment (if any).

List of subsidiaries has been presented in Note 16.

b) Associates

Associates are all entities over which the Group has significant influence but not control or joint control. Investments in associates are accounted for using the equity method of accounting.

In the separate financial statements, investments in associates are accounted for using cost method less impairment (if any).

List of associates has been presented in Note 16.

c) Joint arrangements

Investments in joint arrangements are classified as either joint operations or joint ventures depending on the contractual rights and obligations of each investor, rather than the legal structure of the joint arrangements.

Joint operations

A joint operation is a joint arrangement whereby the Group has rights to the assets, and obligations for the liabilities relating to the arrangement. The Group recognises its direct right to the assets, liabilities, revenues and expenses of joint operations and its share of any jointly held or incurred assets, liabilities, revenues and expenses. These have been incorporated in the Group's financial statement line items.

Joint ventures

A joint venture is a joint arrangement whereby the Group has rights to the net assets of the arrangement. Interests in joint ventures are accounted for using the equity method in the consolidated financial statements.

In the separate financial statements, investments in joint ventures are accounted for using cost less impairment (if any).

List of joint ventures and joint operations have been presented in Note 16.

d) Equity method

The investment is initially recognised at cost which is consideration paid and directly attributable costs.

The Group's subsequently recognises shares of its associates and joint ventures' profits or losses and other comprehensive income in the profit or loss and other comprehensive income, respectively. The subsequent cumulative movements are adjusted against the carrying amount of the investment.

When the Group's share of losses in associates and joint ventures equals or exceeds its interest in the associates and joint ventures, the Group does not recognise further losses, unless it has incurred obligations or made payments on behalf of the associates and joint ventures.

e) Changes in ownership interests

The Group treats transactions with non-controlling interests that do not result in a loss of control as transactions with equity owners of the Group. A difference between the amount of the adjustment to non-controlling interests to reflect their relative interest in the subsidiary and any consideration paid or received is recognised within equity.

If the ownership interest in associates and joint ventures is reduced but significant influence and joint control is retained, only a proportionate share of the amounts previously recognised in other comprehensive income is reclassified to profit or loss where appropriate. Profit or loss from reduce of the ownership interest in associates and joint ventures is recognise in profit or loss.

When the Group loses control, joint control or significant influence over investments, any retained interest in the investment is remeasured to its fair value, with the change in carrying amount recognised in profit or loss. The fair value becomes the initial carrying amount of the retained interest which is reclassified to investment in an associate, or a joint venture or a financial asset accordingly.

f) [Intercompany transactions on consolidation](#)

Intra-group transactions, balances and unrealised gains on transactions are eliminated. Unrealised gains on transactions between the Group and its associates and joint ventures are eliminated to the extent of the Group's interest in the associates and joint ventures. Unrealised losses are also eliminated in the same manner unless the transaction provides evidence of an impairment of the asset transferred.

5.2 [Business combination](#)

The Group applies the acquisition method to account for business combinations with an exception on business combination under common control. The consideration transferred for the acquisition of a subsidiary comprises.

- Fair value of the assets transferred,
- Liabilities incurred to the former owners of the acquiree,
- Equity interests issued by the Group.

Identifiable assets and liabilities acquired and contingent liabilities assumed in a business combination are measured initially at their fair values at the acquisition date.

The excess of the consideration transferred, the amount of any non-controlling interest recognised and the acquisition-date fair value of any previous equity interest in the acquiree (for business combination achieved in stages) over the fair value of the identifiable net assets acquired is recorded as goodwill. In the case of a bargain purchase, the difference is recognised directly in profit or loss.

Acquisition-related cost are recognised as expenses in consolidated financial statements.

Subsequent changes to the fair value of the contingent consideration that is an asset or liability is recognised in profit or loss. Contingent consideration that is classified as equity is not re-measured.

Business combination under common control

The Group accounts for business combination under common control by measuring acquired assets and liabilities of the acquiree at their carrying values presented in the highest level of the consolidation. The Group retrospectively adjusted the business combination under common control transactions as if the combination had occurred on the later of the beginning of the preceding comparative period and the date the acquiree has become under common control.

Consideration of business combination under common control are the aggregated amount of fair value of assets transferred, liabilities incurred and equity instruments issued by the acquirer at the date of which the exchange in control occurs.

The difference between consideration under business combination under common control and the acquirer's interests in the carrying value of the acquiree is presented as "surplus arising from business combination under common control" in equity and is derecognised when the investment is disposed.

5.3 Foreign currency translation

a) Functional and presentation currency

Items included in the financial statements of each of the Group's entities are measured using the currency of the primary economic environment in which the entity operates (the functional currency). The financial statements are presented in US Dollar, which is the Company's functional currency and the Company's and Group's presentation currency.

b) Transactions and balances

Foreign currency transactions are translated into the functional currency using the exchange rates prevailing at the dates of the transactions. Foreign exchange gains and losses resulting from the settlement of such transactions and from the translation at year-end exchange rates of monetary assets and liabilities denominated in foreign currencies are recognised in the profit or loss.

When a gain or loss on a non-monetary item is recognised in other comprehensive income, any exchange component of that gain or loss is recognised in other comprehensive income. Conversely, when a gain or loss on a non-monetary item is recognised in profit or loss, any exchange component of that gain or loss is recognised in profit or loss.

c) Group companies

The operational results and financial position of the Group's entities (none of which has the currency of a hyper-inflationary economy) that have a different functional currency from the Group's presentation currency are translated into the presentation currency.

To comply with the financial reporting requirements of the Stock Exchange of Thailand and the Department of Business Development, the Group presents the financial statements by translating from US Dollar to Thai Baht as follows:

- Assets and liabilities are translated at the closing rate at the date of respective statement of financial position;
- Income and expenses for statement of income and statement of comprehensive income are translated at average exchange rates during the period; and
- All resulting exchange differences from such translations are recognised in other comprehensive income (expense).

5.4 Cash and cash equivalents

Cash and cash equivalents includes cash on hand, deposits at bank, short-term highly liquid investments with maturities of three months or less from acquisition date.

5.5 Trade accounts receivable

Trade receivables are amounts due from customers for goods sold or services performed in the ordinary course of business.

Trade receivables are recognised initially at the amount of consideration that is unconditional unless they contain significant financing components, they are recognised at fair value. The Group measures them subsequently at amortised cost.

The impairment of trade accounts receivable are disclosed in Note 5.8 (f).

5.6 Inventories

Inventories are stated at the lower of cost and net realisable value.

Cost of inventories is determined by the weighted average method. Net realisable value is the estimated selling price in the ordinary course of business less the costs of completion and selling expenses.

5.7 Materials and supplies

Materials and supplies are stated at cost less allowance for obsolescence. The costs of materials and supplies are determined using the weighted average cost method.

5.8 Financial asset

a) Classification

The Group classifies its debt instrument financial assets into the following measurement categories depending on i) business model for managing the asset and ii) the cash flow characteristics of the asset whether they represent solely payments of principal and interest (SPPI).

- Those to be measured subsequently at fair value through other comprehensive income (FVOCI) or fair value through profit or loss (FVPL); and
- Those to be measured at amortised cost.

For investments in equity instruments, the Group has an irrevocable election at the time of initial recognition to account for the equity investment at a) fair value through profit or loss or b) at fair value through other comprehensive income except those that are held for trading, they are measured at FVPL.

b) Recognition and derecognition

Regular way purchases, acquires and sales of financial assets are recognised on the trade date, which the Group commits to purchase or sell the asset. Financial assets are derecognised when the rights to receive cash flows from the financial assets have expired or have been transferred and the Group has transferred substantially all the risks and rewards of ownership.

c) Measurement

At initial recognition, the Group measures a financial asset at its fair value plus or minus, in the case of a financial asset not at FVPL, transaction costs that are directly attributable to the acquisition of the financial asset. Transaction costs of financial assets carried at FVPL are expensed in profit or loss.

Financial assets with embedded derivatives are considered in their entirety when determining whether the cash flows are solely payment of principal and interest.

d) Debt instruments

Subsequent measurement of debt instruments depends on the Group's business model for managing the asset and the cash flow characteristics of the financial assets. There are three measurement categories into which the Group classifies its debt instruments:

- Amortised cost - Financial assets that are held for collection of contractual cash flows where those cash flows represent solely payments of principal and interest are measured at amortised cost. Interest income from these financial assets is included in interest income using the effective interest rate method. Any gain or loss arising on derecognition and foreign exchange gains and losses are recognised in profit or loss and presented in other gains/(losses) and gain (loss) on foreign exchange rates, respectively. Impairment losses are presented as a separate line item in the statement of income.
- FVOCI - Financial assets that are held for i) collection of contractual cash flows and ii) for selling the financial assets are measured at FVOCI. Movements in the carrying amount are taken through other comprehensive income (OCI), except for the recognition of impairment gains or losses, interest income using the effective interest method, and foreign exchange gains and losses which are recognised in profit or loss. When the financial assets is derecognised, the cumulative gain or loss previously recognised in OCI is reclassified from equity to profit or loss and recognised in other gains/(losses). Interest income is included in interest income. Impairment expenses are presented separately in the statement of income.

- FVPL - Financial assets that do not meet the criteria for amortised cost or FVOCI are measured at FVPL. A gain or loss on a debt investment that is subsequently measured at FVPL is recognised in profit or loss and presented in gains (loss) on remeasuring of financial instruments from in the period in which it arises.

The Group reclassifies debt instruments only when its business model for managing those assets changes.

e) **Equity instruments**

The Group measures all equity investments at fair value. Where the Group has elected to present fair value gains and losses on equity instruments in OCI, there is no subsequent reclassification of fair value gains and losses to profit or loss following the derecognition of the investment. Dividends from such investments continue to be recognised in profit or loss as other income when the right to receive payments is established.

Changes in the fair value of financial assets at FVPL are recognised in gain on remeasuring financial instruments in the incurring period.

Impairment losses and reversal of impairment losses on equity investments are reported together with changes in fair value.

f) **Impairment**

The Group applies the TFRS 9 simplified approach in recognising the impairment of trade and other receivables, which applies lifetime expected credit loss, from initial recognition, for trade and other receivables.

To measure the expected credit losses, trade receivables have been grouped based on shared credit risk characteristics and the days past due. The expected loss rates are based on the payment profiles and the corresponding historical credit losses experienced. The historical loss rates are adjusted to reflect current and forward-looking information on macroeconomic factors affecting the ability of the customers to settle the receivables.

For long-term loans to related parties and other financial assets carried at amortised cost and FVOCI, the Group applies TFRS 9 general approach in measuring the impairment of those financial assets. Under the general approach, the 12-month or the lifetime expected credit loss is applied depending on whether there has been a significant increase in credit risk since the initial recognition.

The credit risk assessment is performed at the end of each reporting period whether there is any significant increase in credit risk profile from the initial recognition by comparing i) expected risk of default as of the reporting date and ii) estimated risk of default on the date of initial recognition.

The Group assesses expected credit loss by taking into consideration forward-looking information and past experiences. The expected credit loss is a probability-weighted estimate of credit losses (probability-weighted present value of estimated cash shortfall). The cash shortfall is the difference between all contractual cash flows that are due to the Group and all cash flows expected to receive, discounted at the original effective interest rate.

When measuring expected credit losses, the Group reflects the following:

- Probability-weighted estimated uncollectible amounts;
- Time value of money; and
- Supportable and reasonable information as of the reporting date about past experience, current conditions and forecasts of future situations.

Impairment and reversal of impairment losses are recognised in profit or loss and included in administrative expenses.

5.9 Group of non-current assets held-for-sale

Non-current assets (or disposal groups) are classified as assets held-for-sale when their carrying amount will be recovered principally through a sale transaction and a sale is considered highly probable. They are measured at the lower of the carrying amount and fair value less costs to sell.

An impairment loss is recognised for initial and subsequent write-down of the asset (or disposal group) to fair value less costs to sell. A gain is recognised for any subsequent increases in fair value less costs to sell of an asset (or disposal group), but not in excess of any cumulative impairment loss previously recognised.

Non-current assets (including those that are part of a disposal group) are not depreciated or amortised.

5.10 Property, plant and equipment

Property, plant and equipment are presented at cost, after deducting accumulated depreciation and the provision for the impairment of assets.

Land is not depreciated. Depreciation on other assets is calculated as follows:

a) Exploration and production assets

The Group follows the Successful Efforts Method in accounting for its assets used for exploration and production activities as follows:

Cost of exploration and production assets

- Costs of exploration and production assets comprise total acquisition costs of petroleum rights or the acquisition costs of the portion of properties, decommissioning costs as well as support equipment and facilities.
- Exploratory drilling costs are capitalised as exploration and evaluation assets and will be classified as oil and gas properties of the projects if their exploratory wells have identified proved reserves that have been found to be commercially producible. However, if the exploratory wells have not identified proved reserves or have identified proved reserves but have not been found to be commercially producible, such drilling costs will be expensed in the statements of income.
- Exploration costs, comprising geological and geophysical costs as well as area reservation fees during the exploration stage, are charged to expenses in the statement of income when incurred.
- Development costs, whether relating to the successful or unsuccessful development of wells, are capitalised as oil and gas properties.

Depreciation and depletion

- The capitalised acquisition costs of petroleum rights are depreciated using the unit of production method based on proved reserves. Depreciation of exploratory wells, development costs as well as decommissioning costs, except unsuccessful projects, are calculated using the unit of production method based on proved reserves or proved developed reserves. The Group recognises changes in reserve estimates prospectively.
- Proved reserves and proved developed reserves are calculated by the engineers of the Company and are based on the information received from the joint operators.
- Depreciation for support equipment and facilities is calculated using the straight-line method with an estimated useful life of assets not exceeding 20 years.
- Depreciation for remuneration for the renewal of petroleum production is calculated using the straight-line method with an estimated useful life not exceeding 10 years in accordance with the agreement.

b) Pipelines and others

Costs of properties comprises of other direct costs necessary to bring the asset to working condition suitable for its intended use.

Depreciation of pipelines and others is determined using the straight-line method with an estimated useful life of assets not exceeding 30 years.

The assets' residual values and useful lives are reviewed, and adjusted if appropriate, at the end of each reporting period.

Subsequent costs are included in the asset's carrying amount, only when it is probable that future economic benefits associated with the item will flow to the Group. The carrying amount of the replaced part is derecognised.

Repair and maintenance costs are recognised as expenses when incurred.

Gains and losses on disposal of property, plant and equipment are determined by comparing proceeds from disposal with the carrying amount and are recognised in the statement of income when incurred.

5.11 Rights to receive reimbursement from decommissioning funds

Rights to receive reimbursement from decommissioning funds is recognised at present value when the Group contribute cash into the fund in accordance to terms and it is certainly probable that it can reimburse the cost of decommissioning from the funds. When funds reimburse cash to the Group after the completion of the decommissioning activities, cash will be adjusted against the right to receive reimbursement from decommissioning funds. The differences between the amount received and the remaining carrying amount of the decommissioning fund is recognised profit or loss.

The Group will not offset the rights to receive reimbursement from decommissioning fund with provisions for decommissioning costs if the Group is still obligated to the decommissioning liabilities. The Group does not have control, joint control or significant influence over the funds.

5.12 Goodwill

Goodwill arises from the business combination which represents the excess of the fair value of the consideration transferred over the fair value of the net identifiable assets, liabilities and contingent liabilities of the acquired subsidiaries, joint operations, associates or joint ventures undertaking at the date of the acquisition.

Goodwill on acquisitions of subsidiaries and joint operations is separately reported in the statements of financial position, while goodwill on acquisitions of associates and joint ventures is included in investment in associates and joint ventures.

Goodwill is not amortised but is annually tested for impairment. Goodwill is allocated to cash-generating unit of group of cash-generating units that are expected to gain benefit from the business combination that caused goodwill. Goodwill is presented at cost less accumulated impairment losses.

Impairment losses on goodwill are not reversed. The carrying amount of goodwill is included in the gains and losses on the disposal of business when it is divested.

5.13 Intangible assets

Intangible assets are presented at cost, after deducting accumulated amortisation and the allowance for the impairment of assets.

Where the carrying amount of an asset is greater than its estimated recoverable amount, it is written down to its recoverable amount.

Intangible assets are amortised using the straight-line method according to asset's useful life but not exceeding 10 years.

Research and development/ internally generated intangible assets

Research expenditure is recognised as an expense as incurred.

Development expenditure is recognised as an asset when the Group can demonstrate all of the following:

- The expenditure attributable to its development can be measured reliably and feasibility in technical, financial, commercial, and resource and;
- The Group intends to and has the ability to complete the development for the purpose of using or selling.

Development costs previously recognised as an expense are not recognised as an asset in a subsequent period.

Other intangible assets

Other intangible assets comprise expenditures incurred to acquire computer software licenses and concession rights in midstream oil and gas business.

5.14 Exploration and evaluation assets

Exploration and evaluation expenditures are capitalised at cost as exploration and evaluation assets. If the projects have identified the proved reserves that have been found to be commercially producible, the capitalised exploration and evaluation expenditures under these projects will be transferred to oil and gas properties of the projects with proved reserves. Subsequent accounting of such costs is described in the accounting policy for property, plant and equipment in Note 5.10 - Property, Plant and Equipment. The capitalised exploration and evaluation expenditure is written off as expenses in the statements of income in the period in which the projects have not identified proved reserves or have identified proved reserves, but have not been found to be commercially producible.

5.15 Impairment of assets

The Group's assets are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount may exceed the recoverable amount. Intangible assets that have an indefinite useful life or are not ready to be used are tested for impairment annually.

An impairment loss is recognised for the amount by which the carrying amount of the assets exceeds its recoverable amount which is the higher of an asset's fair value less costs to sell and its value in use, and is recorded in the statement of income. For the purposes of assessing impairment, assets are grouped at the lowest levels in which they are separately identifiable.

Estimates of future cash flows used in the evaluation for impairment of assets which relate to petroleum production are made with consideration of the risk assessment on field and reservoir performance which includes the estimate of proved and unproved reserves.

Allowance for impairment of assets, except when relating to goodwill, is reversed as applicable to the extent that the events or circumstances that triggered the original allowance for impairment change. For this circumstance, the increased carrying amount of the assets from the reversal could not exceed the carrying amount (net of amortisation or depreciation), if the Group did not recognise the impairment loss for assets in the prior period.

5.16 Current and deferred income taxes

The tax expense for the period comprises current and deferred tax. Tax is recognised in profit or loss, except to the extent that it relates to items recognised in other comprehensive income or directly in equity.

Current tax

The current income tax is calculated on the basis of the tax laws enacted or substantially enacted at the end of the reporting period. Management periodically evaluates positions taken in tax returns with respect to situations in which applicable tax regulation is subject to interpretation. It establishes provisions where appropriate on the basis of amounts expected to be paid to the tax authorities.

Deferred income tax

Deferred income tax will be recognised when there are temporary differences arising from differences between the tax base of assets and liabilities and their carrying amounts in the financial statements. However, deferred income tax is not recognised for temporary differences arise from:

- Initial recognition of an asset or liability in a transaction other than a business combination that affects neither accounting nor taxable profit or loss is not recognised
- Investments in subsidiaries, associates and joint arrangements where the timing of the reversal of the temporary difference is controlled by the Group and it is probable that the temporary difference will not be reversed in the foreseeable future.

Deferred income tax is measured using tax rates of the period in which temporary difference is expected to be reversed, based on tax rates and tax laws that have been enacted or substantially enacted by the end of the reporting period.

Deferred tax assets are recognised only to the extent that it is probable that future taxable profit will be available against which the temporary differences can be utilised.

Deferred tax assets and liabilities are offset when there is a legally enforceable right to offset current tax assets and liabilities and when the deferred tax assets and liabilities balances relate to the same or different taxable entities which intend either to settle current tax liabilities and assets on a net basis.

5.17 Deferred remuneration under agreement

The Company has an obligation to make a payment to the buyer (PTT) under the conditions in the Gas Sales Agreement of Arthit project. The remuneration is classified as non-current asset, presented under the caption “Other non-current assets”, and amortised over contract life using the straight-line method.

5.18 Leases

Leases – where the Group is lessee

Leases are recognised as a right-of-use asset and a corresponding liability at the date at which the leased asset is available for use by the Group. Each lease payment is allocated between the liability and finance cost. The finance cost is charged to profit or loss over the lease period so as to produce a constant periodic rate of interest on the remaining balance of the liability for each period. The right-of-use asset is depreciated over the shorter of the asset's useful life and the lease term on a straight-line basis.

The Group allocates the consideration in the contract to the lease and non-lease components based on their relative stand-alone prices. In the event that the Group cannot allocate the lease and non-lease components, the Group elected not to separate lease and non-lease components and instead accounts for these as a single lease component.

Assets and liabilities arising from a lease are initially measured at a present value basis. Lease liabilities include the net present value of the following lease payments:

- Fixed payments (including in-substance fixed payments), less any lease incentives receivable
- Variable lease payment that are based on an index or a rate
- Amounts expected to be payable by the lessee under residual value guarantees
- The exercise price of a purchase option if the lessee is reasonably certain to exercise that option, and
- Payments of penalties for terminating the lease, if the lease term reflects the lessee exercising that option.

Lease payments under the extension options period are also included in the measurement of the liability, if the Group is reasonably certain about exercising its extension options.

The lease payments are discounted using the interest rate implicit in the lease. If that rate cannot be determined, the lessee's incremental borrowing rate is used, being the rate that the lessee would have to pay to borrow the funds necessary to obtain an asset of similar value in a similar economic environment with similar terms and conditions.

The Group is exposed to potential future increases in variable lease payments based on an index or rate, which are not included in the lease liability until they take effect. When adjustments to lease payments based on an index or rate take effect, the lease liability is reassessed and adjusted against the right-of-use asset.

Right-of-use assets are measured at cost comprising the following:

- The amount of the initial measurement of lease liability
- Any lease payments made at or before the commencement date less any lease incentives received
- Any initial direct costs; and
- Restoration costs.

Payments associated with short-term leases and leases of low-value assets are recognised on a straight-line basis as an expense in profit or loss. Short-term leases are leases with a lease term of 12 months or less. Low-value assets comprise computer and IT equipment.

Leases - where the Group is the lessor

Assets leased under operating leases are included in property, plant and equipment in the statements of financial position. They are depreciated over their expected useful lives on a basis consistent with other similar property, plant and equipment owned by the Group. Rental income is recognised on a straight-line basis over the lease term.

5.19 Financial liabilities

a) Classification

Financial instruments issued by the Group are classified as either financial liabilities or equity securities by considering contractual obligations.

- Where the Group has an unconditional contractual obligation to deliver cash or another financial asset to another entity, it is considered a financial liability unless there is a predetermined or possible settlement for a fixed amount of cash in exchange of a fixed number of the Group's own equity instruments.
- Where the Group has no contractual obligation or has an unconditional right to avoid delivering cash or another financial asset in settlement of the obligation, it is considered an equity instrument.

Borrowings are classified as current liabilities unless the Group has an unconditional right to defer settlement of the liability for at least 12 months after the reporting date.

b) Measurement

Financial liabilities are initially recognised at fair value and are subsequently measured at amortised cost.

c) Derecognition and modification

Financial liabilities are derecognised when the obligation specified in the contract is discharged, cancelled, or expired.

Where the terms of a financial liability are renegotiated/modified, the Group assesses whether the renegotiation / modification results in the derecognition of that financial liability. Where the modification results in an extinguishment, the new financial liability is recognised based on fair value of its obligation. The remaining carrying amount of financial liability is derecognised. The difference as well as proceed paid is recognised as other gains (losses) in profit or loss.

Where the modification does not result in the derecognition of the financial liability, the carrying amount of the financial liability is recalculated as the present value of the renegotiated / modified contractual cash flows discounted at its original effective interest rate. The difference is recognised in other gains/(losses) in profit or loss.

5.20 Borrowing costs

General and specific borrowing costs directly attributable to the acquisition, construction or production of qualifying assets, are added to the cost of those assets less investment income earned from these specific borrowings. The capitalisation of borrowing costs is ceased when substantially all of the activities necessary to prepare the qualifying assets for its intended use or sale are complete.

Other borrowing costs are recognised as expenses in the period in which they are incurred.

5.21 Employee benefits

The Group has recognised employee benefits based on the types of benefits which are post-employment benefits and other long-term benefits.

a) Post-employment benefits

The Group has recognised both defined contribution and defined benefit plans as follows:

Defined contribution plan

The Group's employees have become members of the following provident funds: "Employee of PTTEP Registered Provident Fund", "Sinsataporn Registered Provident Fund" and "TISCO Master Pooled Fund Registered Provident Fund".

The provident funds are funded by payments from employees and from the Group which are held in a separate trustee-administered fund. The Group contributes to the funds at a rate of 3% - 15% of the employees' salaries which are charged to the statements of income in the period the contributions are made.

Employee retirement benefits

The Group's obligation in respect of the retirement benefit plans is calculated by estimating the amount of future benefits that employees will earn in return for their services to the Group in current and future periods. Such benefits are discounted to the present value. The employee benefits obligation is calculated by an independent actuary using the projected unit credit method. Actuarial gains and losses arising from experience adjustments and changes in actuarial assumptions are charged or credited to equity in other comprehensive income (loss) in the period in which they arise.

Past-service costs are recognised immediately in the statements of income.

b) Other long-term benefits

The Group's other long-term benefits are benefits based on employees' length of service. The Group calculates the amount of these benefits according to the employees' service period.

The expected obligation of these benefits is calculated by independent actuarial experts and accrued over the period of employment based on the same accounting practice used for the employee retirement benefits. Actuarial gains and losses arising from experience adjustments and changes in actuarial assumptions will be recognised in the statements of income in the period in which they arise.

The Group recognises the obligation in respect of employee benefits in the statements of financial position under "Provision for Employee Benefits" as disclosed in Note 28.

5.22 Provisions

Provisions are recognised when the Group has a present legal or constructive obligation as a result of past events; it is probable that an outflow of resources will be required to settle the obligation; and the amount has been reliably estimated.

Provisions are measured at the present value of the expenditures expected to be required to settle the obligation. The increase in the provision due to passage of time is recognised as interest expense.

5.23 Capital management

The Group's objectives when managing capital are to safeguard its ability to continue as a going concern, to provide returns for shareholders and benefits for other stakeholders, and maintain an optimal capital structure to reduce the cost of capital.

5.24 Other reserve for expansion

The Group considers to set aside a reserve for expanding its investments in new projects in the exploration phase, which is generally susceptible to high risk, and for exploration of additional petroleum reserves. The reserve for expansion is set aside at no more than 35% of the net taxable income from its exploration and production activities.

5.25 Revenue recognition

Revenue are recorded net of value added tax. They are recognised in accordance with the provision of goods or services, provided that collectability of the consideration is probable.

Multiple element arrangements involving delivery or provision of multiple products or services are separated into individual distinct performance obligations. Total transaction price of the bundled contract is allocated to each performance obligation based on their relative standalone selling prices or estimated standalone selling prices. Each performance obligation is recognised as revenue on fulfilment of the obligation to the customer.

The Group has the revenue recognition in each category as follows:

Revenue from contracts with customers

Revenue from contracts with customers is recognised when the Group complete performance obligations at a point in time by transferring petroleum product to a customer and the control over the product is transferred to a customer whom the product is physically possessed. The revenue is measured at the fair value of the consideration which the Group expects to be entitled in exchange for petroleum product, provided that collectability of the consideration is probable. Inter-company sales revenue is excluded in the consolidated financial statements.

Deferred income under agreements (Take-or-Pay)

Under the Gas Sales Agreements, the Group has obligations to supply minimum quantities of gas to a customer in each contract year. If in any contract year, the customer has not taken the minimum quantities of gas according to the Gas Sales Agreements, the customer shall pay for quantities of gas not taken (Take-or-Pay). If the customer is unable to take the minimum contracted quantities in a given year, the volume of gas that the customer has paid for but has not taken in that year (Make-up) can be taken free of charge in subsequent years. Payments received in advance under these agreements are recognised as deferred income. This deferred income is recognised in the statements of income when the gas is subsequently taken.

Interest income

Interest income is recognised based on time proportion basis considering on an effective interest rate of one point of time until the end of term and considering on an outstanding balance of the principal recognised in deferred income account of the Group.

Dividend income

Dividend income is recognised when the right to receive payment is established.

Other income

Other income is recognised on an accrual basis.

5.26 Share capital

Ordinary shares with discretionary dividends are classified as equity.

Incremental costs directly attributable to the issue of new shares or options (net of tax) are shown as a deduction in equity.

5.27 Dividend distribution

Dividend distributed to the Company's shareholders is recognised as a liability when interim dividends are approved by the Board of Directors' meeting, and when the annual dividends are approved by the shareholders' meeting.

5.28 Earnings per share

Basic earnings per share are calculated by dividing the income for the year attributable to ordinary shareholders less interest expense for subordinated capital debentures by the weighted average number of ordinary shares outstanding during the year.

Diluted earnings per share are calculated by dividing the income for the year attributable to shareholders less interest expense for subordinated capital debentures by the weighted average number of ordinary shares outstanding during the year, adjusted with dilutive potential ordinary shares. The Company assumes that all dilutive potential ordinary shares are converted into ordinary shares.

5.29 Segment reporting

Operating segments are reported in a manner consistent with the internal reporting provided to the chief operating decision-maker. The chief operating decision-maker is a person responsible for allocating resources and assessing performance of the operating segments that makes strategic decisions.

In considering the segment reporting, the chief operating decision-maker considers product types as well as geographical areas classified by business segments which are identified by different business activities that are subject to risks and returns that are different from those of other business segments.

5.30 Derivatives and hedging activities

a) Embedded derivative and derivatives that do not qualify for hedge accounting

Embedded derivative that is separately accounted for and derivatives that do not qualify for hedge accounting is initially recognised at fair value. Changes in the fair value are included in other gains (losses).

Fair value of derivatives is classified as a current or non-current following its remaining maturity.

b) Hedge accounting

Derivatives are initially recognised at fair value on the date a derivative contract is entered into and are subsequently remeasured to their fair value at the end of each reporting period. The Group designates certain derivatives as either 1) hedges of the fair value of recognised assets or liabilities or 2) hedges of a particular risk associated with the cash flows of highly probable forecast transactions (cash flow hedges).

At inception of the hedge relationship, the Group documents i) the economic relationship between hedging instruments and hedged items including whether changes in the cash flows of the hedging instruments are expected to offset changes in the cash flows of hedged items and ii) its risk management objective and strategy for undertaking its hedge transactions.

The full fair value of a hedging derivative is classified as a current or non-current asset or liability following the maturity of related hedged item.

The fair values of derivative financial instruments designated in cash flow hedge relationships and movements in the hedging reserve in shareholders' equity are disclosed in Note 7.

Cash flow hedges

The effective portion of changes in the fair value of derivatives that are designated and qualified as cash flow hedges is recognised in the cash flow hedge reserve within equity. The gain or loss relating to the ineffective portion is recognised immediately in profit or loss.

The Group applies hedge accounting on cross currency and interest rate swap and interest rate collar (zero cost collar) in hedge relationships that were being used to hedge the underlying assets and liabilities. The Group only designates the spot component of cross currency and interest rate swap and the intrinsic value of interest rate collar (zero cost collar) as hedging instrument. Gains or losses relating to the effective portion of the change in the spot component and intrinsic value are recognised in the cash flow hedge reserve within equity and recognised the changes in foreign currency basis spreads of cross currency and interest rate swap and time value of interest rate collar (zero cost collar) that relate to hedged items as the costs of hedging reserve within other comprehensive income of equity.

Amounts accumulated in equity are reclassified in the periods when the hedged item affects profit or loss.

The gain or loss relating to the effective portion of cross currency and interest rate swap and interest rate collar (zero cost collar) hedging variable rates borrowings and debentures is recognised in profit or loss within finance costs at the same time as the interest expense on the hedged borrowings and debentures.

5.31 Financial guarantee contracts

Financial guarantee contracts are recognised as a financial liability at the time the guarantee is issued. The liability is initially measured at fair value and subsequently at the higher of:

- The amount determined in accordance with the expected credit loss model under TFRS 9; and
- The amount initially recognised less the cumulative amount of income recognised in accordance with the principles of TFRS 15.

The fair value of financial guarantees is determined based on the present value of the difference in cash flows between a) the contractual payments required under the debt instrument; and b) the payments that would be required without the guarantee, or the estimated amount that would be payable to a third party for assuming the obligations.

The Group recognised guarantees associated with loans or other payables without compensation as part of the cost of the investment.

6 Financial risk management

The Group exposes to various risks from its business operations as follows:

6.1 Financial risk

The Group exposes to a variety of financial risks which comprise market risk (including foreign exchange risk, interest rate risk and price risk), credit risk and liquidity risk. The Group's overall risk management programme focuses on the unpredictability of financial markets and seeks to minimise potential effects on the Group's financial performance to an acceptable level. The Group also uses derivative financial instruments to hedge certain exposures.

Financial risk management is centralised and carried out by the financial risk management function. The Group's financial risk management includes areas such as foreign exchange risk, interest rate risk, price risk, credit risk and liquidity risk. The framework parameters are approved by the Board of Directors and uses as the key communication and control tools for financial risk management function of the Group's subsidiaries.

6.1.1 Market risk

a) Foreign exchange risk

The vast majority of the Group's domestic and overseas business (revenues and expenses) are in US Dollar and the Group has determined the US Dollar as the functional currency by considering from revenue and operating expenses used in the primary economic environment in which the entity operates. The Group's exposure to the foreign exchange risk arises from transactions which are denominated in currencies that are not the functional currency.

Exposure

The Group and the Company has significant exposure to financial statements from transactions denominated in Baht at the end of the reporting period as follows:

	Consolidated financial statements			
	31 December 2021		31 December 2020	
	Unit: Million US Dollar	Unit: Million Baht	Unit: Million US Dollar	Unit: Million Baht
Cash and cash equivalents	339	11,341	261	7,826
Trade and other receivables	409	13,653	356	10,685
Cross currency and interest rate swaps				
- hedge derivative *	969	32,400	879	26,400
Long-term loans to related parties	-	-	16	468
Other non-current financial assets	-	8	-	7
Other non-current assets	4	150	5	157
Trade and other payables	(322)	(10,774)	(279)	(8,393)
Forward foreign exchange contracts				
- trading *	(1,001)	(33,467)	(1,008)	(30,289)
Other current liabilities	(100)	(3,333)	-	-
Lease liabilities	(36)	(1,208)	(16)	(484)
Debentures	(969)	(32,384)	(878)	(26,383)

	Separate financial statements			
	31 December 2021		31 December 2020	
	Unit: Million US Dollar	Unit: Million Baht	Unit: Million US Dollar	Unit: Million Baht
Cash and cash equivalents	65	2,184	55	1,661
Trade and other receivables	316	10,564	277	8,329
Cross currency and interest rate swaps				
- hedge derivative *	521	17,400	380	11,400
Long-term loans to related parties	-	-	16	468
Other non-current financial assets	-	8	-	7
Other non-current assets	4	147	5	153
Trade and other payables	(247)	(8,243)	(213)	(6,407)
Short-term loans from a related party	(16)	(548)	(34)	(1,013)
Forward foreign exchange contracts				
- trading *	(901)	(30,125)	(909)	(27,310)
Other current assets	(100)	(3,333)	-	-
Lease liabilities	(26)	(884)	(11)	(328)
Debentures	(520)	(17,384)	(379)	(11,392)

* These are disclosed with notional amount.

Financial instruments used by the Group for risk management

The Group manages its foreign exchange risks on financial assets and financial liabilities those are not the Group's functional currency by balancing the structure and transactions, types of assets, liabilities and equity. In addition, the Group uses derivative instruments to manage and hedge the risks exposure of the foreign currency transaction while it also considers costs, effectiveness, and risks that may arise in each interval.

The Group used cross currency and interest rate swaps, forward foreign exchange contracts and foreign currency options in a consistent manner to hedge firm and anticipated foreign exchange commitments and to manage its foreign exchange risk arising from future commercial transactions. The Group does not usually hedge its net investments in foreign operations except in circumstances where there is a material exposure arising from a currency that is anticipated to be volatile and the hedging is cost effective. The Group manages its foreign exchange risks by swapping into the entity's functional currency. Foreign currency borrowings are swapped into the entity's functional currency using cross currency and interest rate swaps, except where the foreign currency borrowings are repaid with cash flows generated in the same foreign currency. The purpose of these hedges is to mitigate the impact of movements in foreign exchange rates on assets and liabilities and the profit or loss of the Group.

The Group enters into cross currency and interest rate swaps, forward foreign exchange contracts and foreign currency options to hedge its exposure to foreign exchange risk. Under the Group's policy, the critical terms of these contracts must align with the hedged items. However, the Group do not apply hedge accounting for forward foreign exchange contracts and foreign currency options. As a result, gain or loss is recognised in profit or loss.

The Group only designates the spot component of cross currency and interest rate swap in hedge relationships. The spot component is determined with reference to relevant spot market exchange rates. The difference between the contracted forward rate and the spot market exchange rate is defined as the forward points. It is discounted, where material.

The changes in the forward element of the cross currency and interest rate swaps that relate to hedged items are deferred in the costs of hedging reserve.

The Group and the Company entered into a cross currency and interest rate swaps with 100% of total Thai Baht borrowings which are not matched with the Company's and each subsidiary's functional currency.

Cross currency and interest rate swaps comprise of accrued interest income and expense which will be made twice a year. The due date of interest and principal of the cross currency and interest rate swaps are the same date as loan maturity date.

Consolidated financial statements

Consolidated financial statements									
31 December 2020									
Type of hedge	Hedging instrument		Carrying amount of hedging instrument		Hedge ratio	Maturity date	Contractual exchange rate	Swap rate received	Swap rate paid
	Derivative	Total contractual amount (Million US Dollar)	Unit: Million US Dollar	Unit: Million Baht					
Cash flow hedge	Cross currency and interest rate swap	349	34	1,007	1:1	6 June 2029	32.66	4.82%	4.99%
		480	16	467	1:1	19 June 2022	31.25	2.26%	2.63% - 3.05%

Separate financial statements									
31 December 2021									
Type of hedge	Hedging instrument		Carrying amount of hedging instrument		Hedge ratio	Maturity date	Contractual exchange rate	Swap rate received	Swap rate paid
	Derivative	Total contractual amount (Million US Dollar)	Unit: Million US Dollar	Unit: Million Baht					
Cash flow hedge	Gross currency and	349	(6)	(201)	1:1	6 June 2029	32.66	4.82%	4.99%
	interest rate swap	182	(2)	(80)	1:1	5 November 2026	33.00	2.00% - 2.75%	2.46% - 2.55%

Separate financial statements									
31 December 2020									
Type of hedge	Hedging instrument		Carrying amount of hedging instrument		Hedge ratio	Maturity date	Contractual exchange rate	Swap rate received	Swap rate paid
	Derivative	Total contractual amount (Million US Dollar)	Unit: Million US Dollar	Unit: Million Baht					
Cash flow hedge	Gross currency and	349	34	1,007	1:1	6 June 2029	32.66	4.82%	4.99%
	interest rate swap								

Sensitivity analysis

As shown in the table above, the Group is primarily exposed to changes in Baht and US Dollar exchange rates. The sensitivity of profit or loss to changes in the exchange rates arises mainly from financial assets and financial liabilities denominated in foreign currency other than its functional currency and the impact on profit before income tax arises. If the Group determines the exchange rate as at 31 December 2021 and 2020 to be changed by 10% and holding all other variables constant, the impact on profit before income tax of the Group will be as follows:

2021

Baht to US Dollar exchange rate

- increase 10%

- decrease 10%

Consolidated financial statements	
Unit:	Unit:
Million US Dollar	Million Baht
32	1,058
(32)	(1,058)

2020

Baht to US Dollar exchange rate

- increase 10%

- decrease 10%

Consolidated financial statements	
Unit:	Unit:
Million US Dollar	Million Baht
25	751
(25)	(751)

2021

Baht to US Dollar exchange rate

- increase 10%

- decrease 10%

Separate financial statements	
Unit:	Unit:
Million US Dollar	Million Baht
51	1,718
(51)	(1,718)

2020

Baht to US Dollar exchange rate

- increase 10%

- decrease 10%

Separate financial statements	
Unit:	Unit:
Million US Dollar	Million Baht
40	1,192
(40)	(1,192)

b) Interest rate risk

Interest rate risk is the risk of changes in market value of interest rate which affect to the cash flow from assets and liabilities at variable rates. Therefore, the borrowing at variable rates is the cause of the Group's interest rate risk. The Group's main interest rate risk arises from borrowings with variable rates. The Group's policy is to maintain an appropriate proportion of its borrowings at fixed rates and variable rates considering the Group's business operation. In doing so, the Group maintains its fixed interest rate borrowings at 80%. In addition, the Group considers entering into derivative such as interest rate collar (zero cost collar). The Group also considers costs, market conditions, and acceptable risk before entering into the financial instrument to manage interest rate risk.

Following interest rate benchmark reform, there are cessations in several benchmark interest rates including LIBOR, which is applied by the Group as part of the variable rate calculation. The Group had monitored and managed the transition to alternative benchmark rates for loan agreements and financial instruments. As a result, the uncertainty does not significantly impact the Group. As at 31 December 2021, the financial instruments that have not yet to transition to alternative benchmark rates did not have significant impact.

The exposure of the Group's borrowings to interest rate changes of the borrowings at the end of the reporting period are as follows:

Consolidated financial statements						
2021			2020			
Unit: Million US Dollar	Unit: Million Baht	% of total borrowings	Unit: Million US Dollar	Unit: Million Baht	% of total borrowings	
Variable rate						
borrowings - LIBOR	596	19,920	17	595	17,862	17
Fixed rate borrowings	2,746	91,747	78	2,830	85,016	83
Fixed rate borrowings - repricing 1 - 5 years	179	5,991	5	-	-	-
	3,521	117,658	100	3,425	102,878	100

Separate financial statements						
2021			2020			
Unit: Million US Dollar	Unit: Million Baht	% of total borrowings	Unit: Million US Dollar	Unit: Million Baht	% of total borrowings	
Fixed rate borrowings	341	11,393	66	379	11,392	100
Fixed rate borrowings - repricing 1 - 5 years	179	5,991	34	-	-	-
	520	17,384	100	379	11,392	100

The percentage of total borrowings shows the proportion of borrowings that are currently at variable rates and fixed rates in relation to the total amount of borrowings. An analysis by maturities is provided in Note 25.

Financial instruments used by the Group for risk management

The Group had entered into interest rate collar (zero cost collar), which represents 50% of total variable rate borrowing (2020: 50%). The interest rate collar (zero cost collar) comprises of put option with interest rate cap at 2.42% per annum and call option with interest rate floor at 0.20% per annum. The variable interest rate is reference to 6M LIBOR. At the end of the reporting period, the 6M LIBOR rate is at 0.34% per annum (2020: 0.26% per annum).

Under interest rate collar (zero cost collar), the reference interest rate will be determined in April and October according to the reference interest rate of the variable rate borrowings and in case either the reference interest rate exceeds the cap or falls below the floor, the net interest receivable and payable is required to be settled every 180 days. The settlement dates coincide with the dates on which is payable on the underlying variable rate borrowings.

The Group's exposure of interest rate-related hedging instrument to financial position and performance are as follows:

Consolidated financial statements						
31 December 2021						
Type of hedge	Hedging instrument		Carrying amount of hedging instrument		Hedge ratio	Maturity date
	Derivative	Total contractual amount (Million US Dollar)	Unit: Million US Dollar	Unit: Million Baht		
Cash flow hedge	Interest rate collar (zero cost collar)	300	1	28	1:1	21 October 2024
					Swap rate received	Swap rate paid
					Reference interest rate, as of borrowing's interest rate reset date, floats over 2.42% per annum	Reference interest rate, as of borrowing's interest rate reset date, floats below 0.20% per annum

Consolidated financial statements							
31 December 2020							
Type of hedge	Hedging instrument		Carrying amount of hedging instrument		Hedge ratio	Maturity date	Swap rate received
	Derivative	Total contractual amount (Million US Dollar)	Unit: Million US Dollar	Unit: Million Baht			
Cash flow hedge	Interest rate collar (zero cost collar)	300	(1)	(20)	1:1	21 October 2024	Reference interest rate, as of borrowing's interest rate reset date, floats over 2.42% per annum
							Reference interest rate, as of borrowing's interest rate reset date, floats below 0.20% per annum

Sensitivity analysis

Profit or loss is mainly sensitive to higher or lower interest expenses from borrowings as a result of changes in interest rates.

The Group is exposed to change in market rate of variable interest rate borrowings from financial institutions. If the Group determines the interest rate to be changed and holding all other variables constant, the impact on profit before income tax of the Group will be as follows:

2021

Interest rate

- Increase 1%
- Decrease 1%

Consolidated financial statements	
Unit:	Unit:
Million US Dollar	Million Baht
(3)	(97)
3	97

2020

Interest rate

- Increase 1%
- Decrease 1%

Consolidated financial statements	
Unit:	Unit:
Million US Dollar	Million Baht
(4)	(125)
4	125

c) Price risk*Exposure*

The Group's exposure to price risk arises from petroleum product prices because the Group's selling price of petroleum products is reference to the world's crude oil price, which are fluctuated subject to various factors beyond its control.

Fluctuations in the world's crude oil prices directly affect the prices of the Group's crude oil and condensate, while the prices of natural gas, which is the main product of the Group, change in the same direction with the reference oil prices and other factors in the gas price formula. Natural gas prices have adjusted periods that reflect actual price delayed by every 6 to 24 months (lag time) depending on each contract. The natural gas price will move corresponding to lower volatility compared to the prices of crude oil and condensate.

The Group has managed the price risk by analysing the impact of the level of oil price changes to revenue, cash flow and net profit of the Group annually. The risk mitigation plan is reviewed by the Risk Management Committee and the Board of Directors in order to be used as the Group's operation framework.

As at 31 December 2021, the Group entered into oil price hedging derivatives for the year 2022 totalling 15.4 million barrel (2021: the Group entered into oil price hedging derivatives for the year 2021 totalling 24.49 million barrel).

Sensitivity analysis

The changes in oil price, holding all other variables constant, will impact fair value of oil price hedging derivative as at 31 December 2021 and 2020 as follows:

Consolidated financial statements		
	Unit: Million US Dollar	Unit: Million Baht
2021		
Price per barrel		
- Increase 1 US Dollar	(8)	(269)
- Decrease 1 US Dollar	8	273
2020		
Price per barrel		
- Increase 1 US Dollar	(8)	(244)
- Decrease 1 US Dollar	8	232

6.1.2 Credit risk

a) Risk management

The Group's policy to manage its credit risk is to enter into transactions with the customers who have good credit profiles. The majority of sales is made with PTT Public Company Limited, the parent company. In addition, the Group carefully assesses and regularly reviews the credit profiles of its customers.

The Group places deposits with the banks which are rated at investment grade level. The Group regularly assesses credit quality and stability of these banks by taking into account of their credit rating, investment portfolio and other financial ratios which demonstrate their performance and the ability to control their business risks, such as non-performing loan to total loan ratio. These factors are used to manage risks and to consider the amount of bank deposit limit in order to ensure that deposits are well-diversified and to avoid concentration risks with individual bank together with the consideration yields and acceptable risk in each time interval.

Before entering into financial derivative contracts, the Group has assessed the financial position and credit worthiness, including setting up credit exposure limit, of counterparty bank in the same way as when the Group assesses banks before placing deposit as described above. Currently all banks in which the Group has entered into financial derivative contracts are rated at investment grade level. In addition, the Group has adjusted, based on the timing and type of transactions, the outstanding balance of each derivative financial instrument made with banks to reflect the risk-adjusted exposure and has diversified transactions to avoid concentration risks with individual bank together with the costs, consideration yields and risks arising in each interval.

b) Security

For some trade receivables, the Group may obtain security in the form of guarantees or letters of credit which can be called upon if the counterparty is in default under the terms of the agreement.

c) Impairment of financial assets

The Group has following financial assets that are subject to the expected credit loss model as follows:

- Cash and cash equivalents
- Short-term investments
- Trade and other receivables
- Other current assets
- Short-term loans to a related party
- Long-term loans to related parties
- Other non-current financial assets
- Other non-current assets

Management consider that impairment loss of financial assets mentioned above are immaterial.

6.1.3 Liquidity risk

Liquidity risk is the risk that suitable sources of funding for the Group's business activities may not be available. The Group's contractual maturity of liabilities and interest, including the derivative contracts are as follows:

a) Maturity of financial liabilities

The tables below analyse the maturity of financial liabilities grouping based on their contractual maturities. The amounts disclosed are the contractual undiscounted cash flows as at 31 December 2021 and 2020.

	Consolidated financial statements				
	Unit: Million US Dollar				
	Within 1 year	1 - 5 years	Over 5 years	Total	Total carrying amount
2021					
Trade and other payables	1,082	-	-	1,082	1,082
Other current liabilities	132	-	-	132	132
Lease liabilities	196	331	89	616	572
Contingent considerations from business acquisition	1	76	-	77	72
Loans from financial institutions - variable interest rate					
Principal	-	600	-	600	596
Interest expense *	7	17	-	24	1
Debentures - fixed interest rate					
Principal	449	179	2,331	2,959	2,925
Interest expense *	105	402	1,404	1,911	11
Cross currency and interest rate swaps – net **	35	9	11	55	41
Forward foreign exchange contracts – net **	-	-	-	-	2

	Consolidated financial statements				
	Unit: Million US Dollar				
	Within 1 year	1 - 5 years	Over 5 years	Total	Total carrying amount
2020					
Trade and other payables	880	-	-	880	880
Other current liabilities	112	-	-	112	112
Lease liabilities	150	302	119	571	507
Contingent considerations from business acquisition	2	4	-	6	6
Contingent considerations from participating interest acquisition in a joint venture	55	-	-	55	53
Loans from financial institutions - variable interest rate					
Principal	-	600	-	600	595
Interest expense *	8	25	-	33	1
Debentures - fixed interest rate					
Principal	-	499	2,370	2,869	2,830
Interest expense *	109	398	1,507	2,014	12
Forward foreign exchange contracts – net **	40	-	-	40	26

	Consolidated financial statements				
	Unit: Million Baht				
	Within 1 year	1 - 5 years	Over 5 years	Total	Total carrying amount
2021					
Trade and other payables	36,163	-	-	36,163	36,163
Other current liabilities	4,422	-	-	4,422	4,422
Lease liabilities	6,553	11,072	2,954	20,579	19,153
Contingent considerations from business acquisition	32	2,555	-	2,587	2,412
Loans from financial institutions – variable interest rate					
Principal	-	20,052	-	20,052	19,920
Interest expense *	245	558	-	803	42
Debentures - fixed interest rate					
Principal	15,000	6,000	77,905	98,905	97,738
Interest expense *	3,509	13,433	46,912	63,854	373
Cross currency and interest rate swaps – net **	1,176	308	367	1,851	1,379
Forward foreign exchange contracts – net **	-	-	-	-	55

	Consolidated financial statements				
	Unit: Million Baht				Total carrying amount
	Within 1 year	1 - 5 years	Over 5 years	Total	
2020					
Trade and other payables	26,430	-	-	26,430	26,430
Other current liabilities	3,355	-	-	3,355	3,355
Lease liabilities	4,516	9,075	3,571	17,162	15,230
Contingent considerations from business acquisition	61	114	-	175	169
Contingent considerations from participating interest acquisition in a joint venture	1,642	-	-	1,642	1,601
Loans from financial institutions - variable interest rate					
Principal	-	18,022	-	18,022	17,862
Interest expense *	228	752	-	980	41
Debentures - fixed interest rate					
Principal	-	15,000	71,174	86,174	85,016
Interest expense *	3,288	11,967	45,252	60,507	374
Forward foreign exchange contracts – net **	1,209	-	-	1,209	788

	Separate financial statements				
	Unit: Million US Dollar				
	Within 1 year	1 - 5 years	Over 5 years	Total	Total carrying amount
2021					
Trade and other payables	356	-	-	356	356
Other current liabilities	102	-	-	102	102
Lease liabilities	31	29	1	61	60
Debtentures – fixed interest rate					
Principal	-	180	341	521	520
Interest expense *	20	83	41	144	4
Cross currency and interest rate swaps – net **	2	9	11	22	8
Forward foreign exchange contracts – net **	-	-	-	-	1

	Separate financial statements				
	Unit: Million US Dollar				
	Within 1 year	1 - 5 years	Over 5 years	Total	Total carrying amount
2020					
Trade and other payables	299	-	-	299	299
Other current liabilities	3	-	-	3	3
Lease liabilities	27	31	2	60	57
Debentures - fixed interest rate					
Principal	-	-	380	380	379
Interest expense *	18	73	64	155	3
Forward foreign exchange contracts – net **	37	-	-	37	23

	Separate financial statements				
	Unit: Million Baht				
	Within 1 year	1 - 5 years	Over 5 years	Total	Total carrying amount
2021					
Trade and other payables	11,883	-	-	11,883	11,883
Other current liabilities	3,414	-	-	3,414	3,414
Lease liabilities	1,025	954	45	2,024	2,011
Debentures – fixed interest rate					
Principal	-	6,000	11,400	17,400	17,384
Interest expense *	669	2,753	1,374	4,796	127
Cross currency and interest rate swaps – net **	77	308	367	752	281
Forward foreign exchange contracts – net **	-	-	-	-	43

	Separate financial statements				
	Unit: Million Baht				Total carrying amount
	Within 1 year	1 - 5 years	Over 5 years	Total	
2020					
Trade and other payables	8,966	-	-	8,966	8,966
Other current liabilities	79	-	-	79	79
Lease liabilities	806	931	53	1,790	1,707
Debentures - fixed interest rate					
Principal	-	-	11,400	11,400	11,392
Interest expense *	550	2,198	1,923	4,671	80
Forward foreign exchange contracts – net **	1,104	-	-	1,104	681

The major assumptions for the data presented in the table above are that all the interest expenses are calculated based on the nominal interest rate and there is no change in aggregate principal amounts of loans other than repayment at scheduled maturity.

- Thai Baht liabilities were equivalent to US Dollar at the closing rate at the date respective statement of financial position.

* Interest paid represents the interest payment due within year.

** Derivatives were presented at the net amount between cash inflow and cash outflow.

As at 31 December 2021, the Company has commitments from the guarantees of debentures and loans of its subsidiaries as disclosed in Note 36.3, the maturity date of obligations follows the maturity of loan agreements, debentures and loans of subsidiaries.

b) Financing arrangements

The Group manages its liquidity risks by preparing cash flow forecasts and adjusting financial forecasts on a regular basis, entering into financing program, issuing short-term debt securities in order to access Thailand's capital market, as well as entering into credit facilities with financial institutions with the interest rate agreed in advance.

As at 31 December 2021 and 2020, the outstanding principal amount and undrawn facilities are summarised below.

Consolidated financial statements				
Unit: Million US Dollar			Unit: Million Baht	
	Credit limit	Undrawn amount	Credit limit	Undrawn amount
2021				
Committed credit facility	580	580	19,368	19,368
Uncommitted credit facility	374	374	12,504	12,504

Consolidated financial statements				
Unit: Million US Dollar			Unit: Million Baht	
	Credit limit	Undrawn amount	Credit limit	Undrawn amount
2020				
Committed credit facility	600	600	18,015	18,015
Uncommitted credit facility	423	423	12,718	12,718

Separate financial statements				
Unit: Million US Dollar			Unit: Million Baht	
	Credit limit	Undrawn amount	Credit limit	Undrawn amount
2021				
Committed credit facility	180	180	6,000	6,000
Uncommitted credit facility	373	373	12,451	12,451

	Separate financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	Credit limit	Undrawn amount	Credit limit	Undrawn amount
2020				
Committed credit facility	200	200	6,000	6,000
Uncommitted credit facility	422	422	12,664	12,664

Thai Baht credit facility is translated to US Dollar using the closing rate at the date respective statement of financial position.

The Company's International Credit Rating is comparable with the Sovereign Rating of Thailand and the National Credit Rating is at the AAA. As a result, the Company can access to the source of fund for the long-term loan at the interest rate approximate the market interest rate. For the years 2021 and 2020, the Company's credit ratings as assigned by prominent credit rating agencies are as follows:

	2021		2020	
	Foreign Currency	Domestic Currency	Foreign Currency	Domestic Currency
Rating Agency				
Moody's	Baa1	Baa1	Baa1	Baa1
Standard and Poor's	BBB+	BBB+	BBB+	BBB+
Fitch Ratings	BBB+	-	BBB+	-
TRIS Rating (National Rating)	-	AAA	-	AAA

6.2 Capital management

6.2.1 Risk management

Capital Risk Management

The Group manages capital to keep financial strength comparable with the leading companies in the same industry, alignment with the business strategy, economy, market positioning and finance cost as well as impact to the financial ratio and credit rating of the Company and providing the ultimate returns to shareholders and benefits to other stakeholders.

7 Derivatives and hedge accounting

Book value of derivatives as at 31 December 2021 and 2020 are disclosed in Note 10.

7.1 Classification of derivative financial instruments

Derivatives are only used for economic hedging purposes, not for speculative investments. The Group adopts hedge accounting for some derivatives which meet the condition of cash flow hedges instruments and determines the hedge ratio at 1:1 considering the relationship of the relevant transactions and risk factors between hedged items and hedging instruments. However, where derivatives do not meet the hedge accounting criteria, they are classified as 'held for trading' for accounting purposes and are accounted for at fair value through profit or loss.

The fair value of a hedging derivative is presented as current or non-current following the maturity of related hedged items.

7.2 Hedge effectiveness

Hedge effectiveness is determined at the inception of the hedge relationship, and through periodic effectiveness assessments, to ensure that an economic relationship exists between the hedged items and hedging instruments.

Foreign exchange risk

For cross currency and interest rate swap, the Group enters into hedging transaction where the critical terms of the hedging instrument match exactly with the terms of the hedged item. The Group therefore performs a qualitative assessment of effectiveness. If changes in circumstances affect the terms of the hedged item such that the critical terms no longer match exactly with the critical terms of the hedging instrument, the Group uses the hypothetical derivative method to assess effectiveness.

In hedging of foreign currency on cross currency and interest rate swap, ineffectiveness may arise if there are changes in the credit risk of the derivative counterparty, a reduction in value of the hedged items, or a significant change in components of cross currency and interest rate swap.

Interest rate risk

The Group enters into interest rate collar (zero cost collar) that have similar critical terms as the hedged item, such as reference rate, payment dates, maturities and notional amount. The Group does not hedge 100% of its loans, therefore the hedged item is identified as a proportion of the outstanding loans up to the notional amount of the interest rate collar (zero cost collar). Because, during the year, all critical terms of the hedging instruments and hedged items are matched, it considered as hedging of economic relationship.

Hedge ineffectiveness for interest rate collar (zero cost collar) is assessed using the same principles as for hedges of cross currency and interest rate swap. It may occur due to changes in the credit risk of the derivative counterparty, changes in critical terms between the interest rate collar (zero cost collar) and loans and potentially effects of the uncertainty caused by Interest rate benchmark (IBOR) reform.

7.3 Cash flow hedge reserve

Hedging reserve includes costs of hedging and cash flow hedge reserve. The cash flow hedge reserve is used to recognise the effective portion of gains or losses on changes in fair value of derivatives that are qualified for hedge accounting.

The Group has hedging reserve presented in other comprehensive income comprising financial instruments as follows:

Consolidated financial statements							
Unit: Million US Dollar						Unit: Million Baht	
	Cost of hedging reserve	Spot component of currency forwards	Intrinsic value of option	Total	Cost of hedging reserve	Spot component of currency forwards	Intrinsic value of option
							Total
As at 1 January 2021	8	(9)	-	(1)	340	(245)	-
Changes in fair value of hedging instruments recognised in OCI	-	(94)	2	(92)	-	(2,874)	47
Costs of hedging deferred and recognised in OCI	3	-	-	3	106	-	-
Reclassified from OCI to profit or loss	-	89	-	89	-	2,738	-
- Gain on foreign exchange rate	(1)	1	-	-	(21)	27	(9)
Deferred tax							(3)
As at 31 December 2021	10	(13)	2	(1)	425	(354)	38
							109

	Consolidated financial statements						
	Unit: Million US Dollar				Unit: Million Baht		
	Cost of hedging reserve	Spot component of currency forwards	Intrinsic value of option	Total	Cost of hedging reserve	Spot component of currency forwards	Intrinsic value of option
As at 1 January 2020	19	10	-	29	707	375	-
Changes in fair value of hedging instruments recognised in OCI	-	(21)	-	(21)	-	(667)	-
Costs of hedging deferred and recognised in OCI	(14)	-	-	(14)	(458)	-	-
Reclassified from OCI to profit or loss	-	(3)	-	(3)	-	(108)	-
- Loss on foreign exchange rate	3	5	-	8	91	155	-
Deferred tax							
As at 31 December 2020	8	(9)	-	(1)	340	(245)	-
							95

	Separate financial statements					
	Unit: Million US Dollar			Unit: Million Baht		
	Cost of hedging reserve	Spot component of currency forwards	Total	Cost of hedging reserve	Spot component of currency forwards	Total
As at 1 January 2021	8	(6)	2	270	(165)	105
Changes in fair value of hedging instruments recognised in OCI	-	(46)	(46)	-	(1,509)	(1,509)
Costs of hedging deferred and recognised in OCI	4	-	4	135	-	135
Reclassified from OCI to profit or loss	-	39	39	-	1,274	1,274
- Gain on foreign exchange rate	(1)	2	1	(27)	47	20
Deferred tax						
As at 31 December 2021	11	(11)	-	378	(353)	25

	Separate financial statements				
	Unit: Million US Dollar			Unit: Million Baht	
	Cost of hedging reserve	Spot component of currency forwards	Total	Cost of hedging reserve	Spot component of currency forwards
As at 1 January 2020	18	10	28	572	350
Changes in fair value of hedging instruments recognised in OCI	-	(19)	(19)	-	(596)
Costs of hedging deferred and recognised in OCI	(12)	-	(12)	(378)	-
Reclassified from OCI to profit or loss	-	(1)	(1)	-	(47)
- Loss on foreign exchange rate	2	4	6	76	128
Deferred tax					
As at 31 December 2020	8	(6)	2	270	(165)
					105

7.4 Amounts recognised in profit or loss

In addition to the amounts reclassified from hedge reserve as disclosed in Note 7.3, the following amounts recognised in profit or loss relating to derivatives:

	Consolidated financial statements	
	Unit: Million US Dollar	
	2021	2020
For the year ended 31 December		
Net gain (loss) on derivatives that do not qualify for hedge accounting, presented in gain (loss) on revaluation of financial instruments	(241)	117

	Consolidated financial statements	
	Unit: Million Baht	
	2021	2020
For the year ended 31 December		
Net gain (loss) on derivatives that do not qualify for hedge accounting, presented in gain (loss) on revaluation of financial instruments	(7,471)	3,759

	Separate financial statements	
	Unit: Million US Dollar	
	2021	2020
For the year ended 31 December		
Net gain (loss) on derivatives that do not qualify for hedge accounting, presented in gain (loss) on revaluation of financial instruments	28	(14)

	Separate financial statements	
	Unit: Million Baht	
	2021	2020
For the year ended 31 December		
Net gain (loss) on derivatives that do not qualify for hedge accounting, presented in gain (loss) on revaluation of financial instruments	907	(444)

8 Critical accounting estimates and judgements

Estimates and judgements are continually evaluated and are based on historical experience and other factors, including expectations of future events that are believed to be reasonable under the circumstances.

8.1 Impairment of assets and goodwill

In assessing the impairment of assets and goodwill the Group estimates using the discounted future cash flows which are based on management's key assumptions in relation to selling price using the future oil price, estimated future production volume based on a proved and probable reserves and gross margin rate. These assumptions are based on management's judgment and past experience as well as the future prediction that is believed to be reasonable in the present situation. Changes in the information or new noticeable information may lead to the change in the assumptions and the discount rate for the estimation of the discounted future cash flows. The assumption of selling price is determined from the short-term oil price based on forward oil price curve and long-term oil price based on demand and supply of oil in the world market.

8.2 Estimation related to the fair values of net identifiable assets from business acquisition

In assessing the fair value of property, plant and equipment and exploration and evaluation assets on acquisition date, the Group estimates using the discounted future cash flows applying uncertain estimated information including management's key assumptions which mainly comprise discount rate, selling price using the future oil price, estimated future production volume and estimated expenditure.

9 Segment and revenue information

For the year ended 31 December 2021

	Consolidated financial statements									
	Exploration and production									Unit: Million US Dollar
	Southeast Asia				Others			Intercompany elimination	Total	
Thailand	Southeast Asia	Other	Middle East	Australia	America	Africa	Others			
Revenues - Third parties	231	926	702	-	2	-	47	63	-	1,971
- Related parties	4,074	844	127	-	-	58	-	-	(250)	4,853
Other income	35	81	-	-	-	-	-	119	(119)	116
Gain from a bargain purchase	-	-	342	-	-	-	-	-	-	342
Interest income	-	1	-	-	-	9	-	-	-	10
Total revenues	4,340	1,852	1,171	-	2	67	47	182	(369)	7,292
Operating expenses	454	512	84	-	1	13	13	53	(269)	861
Exploration expenses	-	59	9	(11)	188	1	-	-	-	226
Administrative expenses	43	58	13	2	7	16	-	91	(101)	129
Petroleum royalties	501	29	-	-	-	-	-	-	-	530
Depreciation, depletion and amortisation	1,339	550	237	-	-	23	15	9	(4)	2,169
Loss on foreign exchange rates	38	14	-	-	1	-	-	-	-	53
Finance costs	54	26	4	-	-	1	-	-	-	85
Share of (profit) loss of associates and joint ventures	-	-	(1)	4	-	-	-	(18)	-	(15)
Impairment loss on assets	-	20	-	-	-	163	-	-	-	183
Total expenses	2,429	1,268	346	(5)	177	217	28	135	(374)	4,221
Segment profit (loss)	1,911	584	825	5	(175)	(150)	19	47	5	3,071
Depreciation - general										(33)
Administrative expenses										(226)
Operating profit										2,812
Other income, net										15
Interest income										7
Finance costs										(117)
Gain on foreign exchange rates										15
Loss on remeasuring financial instruments										(234)
Profit before income taxes										2,498
Income tax - Project	(691)	(228)	(399)	-	-	3	(6)	(10)		(1,331)
- Group										44
Net profit (loss)	1,220	356	426	5	(175)	(147)	13	37		1,211

For the year ended 31 December 2021

As at 31 December 2021As at 31 December 2021

For the year ended 31 December 2020

Consolidated financial statements											
Unit: Million Baht											
	Exploration and production								Others	Intercompany elimination	Total
	Southeast Asia				Other						
	Thailand	Southeast Asia	Middle East	Australia	America	Africa	Others	Others			
For the year ended 31 December 2020											
Revenues - Third parties	7,847	22,943	6,220	-	43	-	813	992	-	38,858	
- Related parties	102,732	25,734	-	-	-	1,344	-	-	(8,268)	121,542	
Other income	570	17	1	2	2	1	-	3,524	(3,266)	851	
Interest income	8	97	5	-	1	201	2	1	(1)	314	
Total revenues	111,157	48,791	6,226	2	46	1,546	815	4,517	(11,535)	161,565	
Operating expenses	14,431	16,073	1,523	-	35	294	315	912	(8,727)	24,856	
Exploration expenses	166	1,685	327	822	182	57	-	-	-	3,239	
Administrative expenses	995	1,938	318	32	166	525	82	2,773	(2,809)	4,020	
Petroleum royalties	12,742	51	-	-	5	-	-	-	-	12,798	
Depreciation, depletion and amortisation	43,526	16,926	2,234	2	8	936	509	275	(84)	64,332	
(Gain) loss on foreign exchange rates	(546)	(46)	-	(8)	49	(1)	2	13	-	(537)	
Finance costs	2,870	1,066	86	-	2	31	8	4	(11)	4,056	
Share of (profit) loss of associates and joint ventures	-	-	59	-	-	-	-	(1,366)	-	(1,307)	
Impairment loss on assets	120	1,326	-	-	1,361	-	-	-	-	2,807	
Total expenses	74,304	39,019	4,547	848	1,808	1,842	916	2,611	(11,631)	114,264	
Segment profit (loss)	36,853	9,772	1,679	(846)	(1,762)	(296)	(101)	1,906	96	47,301	
Depreciation - general										(917)	
Administrative expenses										(5,734)	
Operating profit										40,650	
Other income, net										305	
Interest income										836	
Finance costs										(3,900)	
Gain on foreign exchange rates										281	
Gain on remeasuring financial instruments										3,213	
Gain on debt modification										680	
Other expenses										(637)	
Profit before income taxes										41,428	
Income tax - Project	(11,949)	(5,186)	(2,046)	-	(1)	967	33	(220)		(18,402)	
- Group										(362)	
Net profit (loss)	24,904	4,586	(367)	(846)	(1,763)	671	(68)	1,686		22,664	

For the year ended 31 December 2020

From 1 January 2021, the Group has presented the additional reportable operating segments in accordance with the relevant financial reporting standards. The Group is organised into the following business segments:

- Exploration and production: The Group operates in oil and gas exploration and production both domestically and overseas, either as an operator or as a joint venture partner with international oil and gas companies. Most domestic projects are located in the Gulf of Thailand. Overseas projects are located in Southeast Asia, Middle East, Australia, America, Africa and Others.
- The Group's other operations consist mainly of investments in related business associated with the Group's strategy, and other operations. These do not constitute a separately reportable segment.

The segment information for the year 2020 included in the financial statements has been adjusted retrospectively for comparative purposes.

For the year ended 31 December 2021, the Group has one major customer from revenues under the exploration and production segment, representing 70% of total revenues from sales. The mentioned revenue is presented in Note 15 (a) under the topic transactions with parent company (For the year ended 31 December 2020, the Group has one major customer from revenues under the exploration and production segment, representing 76% of total revenues from sales. The mentioned revenues is presented in Note 15 (a) under the topic transactions with parent company).

10 Fair value

10.1 Fair value estimation

The following tables present financial assets and liabilities recognised by their fair value hierarchy.

	Consolidated financial statements									
	Level 1					Level 2				
	31 December 2021	31 December 2020	31 December 2021	31 December 2020	31 December 2021	31 December 2020	31 December 2021	31 December 2020	31 December 2021	31 December 2020
	Unit: Million US Dollar									
	Total									
Assets										
Financial derivatives assets										
Derivatives assets used for hedging										
- Cross currency and interest rate swap	-	-	-	49	-	-	-	-	-	49
- Interest rate collar (zero cost collar)	-	-	1	-	-	-	-	-	1	-
Derivatives assets measured at fair value through profit or loss										
- Oil price hedge	-	-	9	4	-	-	-	-	9	4
- Forward foreign exchange contracts	-	-	7	-	-	-	-	-	7	-
Other financial assets										
Financial assets measured at fair value through other comprehensive income										
- Investment in equity instruments	1	1	-	-	-	-	-	-	1	1
Other non-current assets										
Assets measured at fair value through profit or loss										
- Pension scheme investments from joint operation	61	55	-	-	-	-	-	-	61	55
Total assets	62	56	17	53	-	-	79	-	109	

	Consolidated financial statements									
	Unit: Million US Dollar									
	Level 1		Level 2		Level 3		Total			
	31 December 2021	31 December 2020	31 December 2021	31 December 2020	31 December 2021	31 December 2020	31 December 2021	31 December 2020	31 December 2021	31 December 2020
Liabilities										
Financial derivatives liabilities										
Derivatives liabilities used for hedging										
- Cross currency and interest rate swap	-	-	41	-	-	-	41	-	-	-
- Interest rate collar (zero cost collar)	-	-	-	1	-	-	-	-	-	1
Derivatives liabilities measured at fair value through profit or loss										
- Oil price hedge	-	-	15	3	-	-	15	-	-	3
- Forward foreign exchange contracts	-	-	2	26	-	-	2	-	-	26
Other current liabilities										
Financial liabilities measured at fair value through profit or loss										
- Contingent considerations from business acquisition	-	-	-	-	1	2	1	2	1	2
- Contingent considerations from participating interest acquisition in joint venture	-	-	-	-	-	53	-	53	-	53
Other non-current liabilities										
Financial liabilities measured at fair value through profit or loss										
- Contingent considerations from business acquisition	-	-	-	-	71	4	71	4	71	4
Total liabilities	-	-	58	30	72	59	130	59	130	89

	Consolidated financial statements									
	Unit: Million Baht									
	Level 1		Level 2		Level 3		Total			
	31 December	31 December	31 December	31 December	31 December	31 December	31 December	31 December	31 December	31 December
	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020
Assets										
Financial derivatives assets										
Derivatives assets used for hedging										
- Cross currency and interest rate swap	-	-	-	1,473	-	-	-	-	-	1,473
- Interest rate collar (zero cost collar)	-	-	28	-	-	-	-	-	28	-
Derivatives assets measured at fair value through profit or loss										
- Oil price hedge	-	-	304	131	-	-	-	-	304	131
- Forward foreign exchange contracts	-	-	245	-	-	-	-	-	245	-
Other financial assets										
Financial assets measured at fair value through profit or loss										
- Investment in debt instruments	6	6	-	-	-	-	-	-	6	6
Financial assets measured at fair value through other comprehensive income										
- Investment in equity instruments	21	16	-	-	1	1	1	1	22	17
Other non-current assets										
Assets measured at fair value through profit or loss										
- Pension scheme investments from joint operation	2,048	1,648	-	-	-	-	-	-	2,048	1,648
Total assets	2,075	1,670	577	1,604	1	1	1	1	2,653	3,275

	Consolidated financial statements									
	Unit: Million Baht									
	Level 1		Level 2		Level 3		Total			
	31 December 2021	31 December 2020	31 December 2021	31 December 2020	31 December 2021	31 December 2020	31 December 2021	31 December 2020	31 December 2021	31 December 2020
Liabilities										
Financial derivatives liabilities										
Derivatives liabilities used for hedging										
- Cross currency and interest rate swap	-	-	1,379	-	-	-	1,379	-	-	-
- Interest rate collar (zero cost collar)	-	-	-	20	-	-	-	-	-	20
Derivatives liabilities measured at fair value through profit or loss										
- Oil price hedge	-	-	493	103	-	-	493	-	-	103
- Forward foreign exchange contracts	-	-	54	788	-	-	54	-	-	788
Other current liabilities										
Financial liabilities measured at fair value through profit or loss										
- Contingent considerations from business acquisition	-	-	-	-	32	60	32	60	32	60
- Contingent considerations from participating interest acquisition in joint venture	-	-	-	-	-	1,601	-	1,601	-	1,601
Other non-current liabilities										
Financial liabilities measured at fair value through profit or loss										
- Contingent considerations from business acquisition	-	-	-	-	2,380	109	2,380	109	2,380	109
Total liabilities	-	-	1,926	911	2,412	1,770	4,338	2,681	4,338	2,681

		Separate financial statements									
		Unit: Million US Dollar									
		Level 1		Level 2		Level 3		Total			
31 December		31 December	2020	31 December	2021	31 December	2020	31 December	2021	31 December	2020
		2021									
Assets											
Financial derivatives assets											
Derivatives assets used for hedging											
- Cross currency and interest rate swap		-	-	-	-	-	34	-	-	-	34
Derivatives assets measured at fair value through profit or loss											
- Forward foreign exchange contracts		-	-	-	6	-	-	-	6	-	-
Total assets		-	-	6	6	-	34	-	6	-	34
Liabilities											
Financial derivatives liabilities											
Derivatives liabilities used for hedging											
- Cross currency and interest rate swap		-	-	8	8	-	-	-	8	-	-
Derivatives liabilities measured at fair value through profit or loss											
- Forward foreign exchange contracts		-	-	1	1	-	23	-	1	-	23
Total liabilities		-	-	9	9	-	23	-	9	-	23

Assets

Financial derivatives assets

Derivatives assets used for hedging

- Cross currency and interest rate swap

Derivatives assets measured at fair value through profit or loss

- Forward foreign exchange contracts

Total assets**Liabilities**

Financial derivatives liabilities

Derivatives liabilities used for hedging

- Cross currency and interest rate swap

Derivatives liabilities measured at fair value through profit or loss

- Forward foreign exchange contracts

Total liabilities

	Separate financial statements									
	Level 1					Level 2				
	Unit: Million Baht					Level 3				
	31 December 2021	31 December 2020	31 December 2021	31 December 2020	31 December 2020	31 December 2021	31 December 2020	31 December 2021	31 December 2020	Total
Assets										
Financial derivatives assets										
Derivatives assets used for hedging										
- Cross currency and interest rate swap	-	-	-	-	1,007	-	-	-	-	1,007
Derivatives assets measured at fair value through profit or loss										
- Forward foreign exchange contracts	-	-	211	-	-	-	-	211	-	-
Other financial assets										
Financial assets measured at fair value through profit or loss										
- Investment in debt instruments	6	6	-	-	-	-	-	6	6	6
Financial assets measured at fair value through other comprehensive income										
- Investment in equity instruments	-	-	-	-	-	1	1	1	1	1
Total assets	6	6	211	1,007		1	1	218	1,014	

	Separate financial statements									
	Unit: Million Baht									
	Level 1		Level 2		Level 3		Total			
	31 December 2021	31 December 2020	31 December 2021	31 December 2020	31 December 2021	31 December 2020	31 December 2021	31 December 2020	31 December 2021	31 December 2020
Liabilities										
Financial derivatives liabilities										
Derivatives liabilities used for hedging										
- Cross currency and interest rate swap	-	-	281	-	-	-	-	-	281	-
Derivatives liabilities measured at fair value through profit or loss										
- Forward foreign exchange contracts	-	-	43	681	-	-	-	-	43	681
Total liabilities	-	-	324	681	-	-	-	-	324	681

The valuation of financial assets and financial liabilities fair value is based on accounting policy disclosed in Note 5.8 Financial assets and Note 5.19 Financial liabilities

Transfer between fair value hierarchy

The Group has no transaction transfer between Level 1, Level 2, and Level 3 of the fair value hierarchy during the year.

10.2 Fair value valuation techniques

Fair values are categorised into hierarchy based on inputs used as follows:

10.2.1 Valuation techniques used to derive level 1 fair values

The fair value of financial instruments is based on quoted prices of each asset or liability by reference of active markets.

10.2.2 Valuation techniques used to derive level 2 fair values

The fair value of financial instruments is determined using valuation techniques which significantly use observable data and, as little as possible, the Group specific estimates.

Valuation techniques used to derive level 2 fair values of financial derivative instruments are as follows:

- Oil price hedge comprises oil price swaps and options. The fair value of oil price swaps is assessed based on the price level which is calculated using the market price of future contracts. The fair value of oil price options is calculated using premium which requires various variable factors, such as the price level of swap, timing of exercise, and price volatility.
- The fair value of forward contracts, including forward foreign exchange contracts with resettable option, are calculated using forward foreign exchange rates that are quoted in an active market for the forward contract portion. The fair value of resettable option is assessed based on various variable factors, such as future forward foreign exchange rate, the market value of swap price, timing of exercise, and foreign exchange rate volatility.
- The fair value of cross currency and interest rate swaps including Memorandum of Understanding on Cross Currency Swap (MOU) in relation to interest rate adjustment with the financial institution, is calculated using forward interest rates derived from the yield curves in an observable interest market and forward foreign exchange rates that are quoted in an active market including assessing the possibilities of interest rate adjustment according to MOU.
- The fair value of interest rate collar which is zero cost collar (option) is assessed based on various variable factors, such as the market price level of swap, reference rate, timing of exercise, and price volatility.

10.2.3 Valuation techniques used to derive level 3 fair values

The fair value of financial instruments is measured using unobservable inputs in which the Group uses discounted cash flows method to derive level 3 fair value.

Changes in level 3 fair value of financial instruments for the year ended as at 31 December 2021 and 2020 are as follows:

	Consolidated financial statements			
	Unit: Million US Dollar			
	Contingent considerations from business acquisition	Contingent from participating interest acquisition in joint venture	Financial assets measured at fair value through comprehensive income	Total
Opening balance as at 1 January 2020	7	52	-	59
Decrease	(1)	-	-	(1)
Changes recognised in profit or loss	-	1	-	1
Closing balance as at 31 December 2020	6	53	-	59
Business acquisition	69	-	-	69
Decrease	(4)	(54)	-	(58)
Changes recognised in profit or loss	1	1	-	2
Closing balance as at 31 December 2021	72	-	-	72

Consolidated financial statements				
Unit: Million Baht				
	Contingent considerations from business acquisition	Contingent considerations from participating interest acquisition in joint venture	Financial assets measured at fair value through comprehensive income	Total
Opening balance as at 1 January 2020	214	1,564	-	1,778
Impact of adoption of TFRS 9	-	-	10	10
Decrease	(53)	-	-	(53)
Reclassification	-	-	(9)	(9)
Changes recognised in profit or loss	7	45	-	52
Currency translation differences	1	(8)	-	(7)
Closing balance as at 31 December 2020	169	1,601	1	1,771
Business acquisition	2,132	-	-	2,132
Decrease	(108)	(1,745)	-	(1,853)
Changes recognised in profit or loss	33	43	-	76
Currency translation differences	186	101	-	287
Closing balance as at 31 December 2021	2,412	-	1	2,413

	Separate financial statements
	Unit: Million US Dollar
	Financial assets measured at fair value through other comprehensive income
Opening balance as at 1 January 2020	-
Impact of adoption of TFRS 9	-
Changes recognised in other comprehensive income	-
Closing balance as at 31 December 2020	-
Changes recognised in other comprehensive income	-
Closing balance as at 31 December 2021	-

	Separate financial statements
	Unit: Million Baht
	Financial assets measured at fair value through other comprehensive income
Opening balance as at 1 January 2020	-
Impact of adoption of TFRS 9	1
Changes recognised in other comprehensive income	-
Currency translation differences	-
Closing balance as at 31 December 2020	1
Changes recognised in other comprehensive income	-
Closing balance as at 31 December 2021	1

The following table summarises the quantitative information about the significant unobservable inputs used in level 3 fair value measurements.

	Fair value				Unobservable inputs		Inputs	
	Unit: Million US Dollar		Unit: Million Baht				2021	2020
	2021	2020	2021	2020				
Contingent consideration in a business combination	72	6	2,412	169	Risk-adjusted discount rate		1.79% - 2.84%	2.71% - 2.84%

The following table presents the relationship of unobservable inputs to fair value:

	Change in fair value			
	Unobservable input	Movement	Decrease in assumption	
			2021	2021
Contingent consideration in a business combination	Risk-adjusted discount rate	1.00%	Decrease by 1.11% - 3.91%	Increase by 1.14% - 4.08%

The Group's valuation processes

Significant unobservable input of fair value hierarchy level 3 is risk adjusted discount rate. It is estimated based on the Group's cost of debt and assumptions relating to possibilities in accordance to conditions as specified in sale and purchase agreement (SPA).

The fair value of investments in unquoted equity, classified as financial assets and measured at fair value through comprehensive income, were assessed based on business plan and market conditions. Management considers that the book value of the financial assets approximates their fair value.

The following figures presented fair value and book value of assets and financial liabilities for each category, but not include transaction which has a book value similar to fair value.

The details of fair values of long-term loans and long-term liabilities as at 31 December 2021 and 2020 calculated by using the discounted cash flow based on a discount rate of borrowing with similar terms are as follows:

		Consolidated financial statements							
		Unit: Million US Dollar				Unit: Million Baht			
		Book value		Fair value		Book value		Fair value	
		2021	2020	2021	2020	2021	2020	2021	2020
Unsecured and unsubordinated debentures		2,925	2,830	3,278	3,294	97,738	85,016	109,542	98,941

		Separate financial statements							
		Unit: Million US Dollar				Unit: Million Baht			
		Book value		Fair value		Book value		Fair value	
		2021	2020	2021	2020	2021	2020	2021	2020
Long-term loans to related parties		6,441	6,796	7,035	6,796	215,252	204,131	235,123	204,131
Unsecured and unsubordinated debentures		520	379	574	450	17,384	11,392	19,176	13,525

Book value of long-term loans to related parties and unsecured and unsubordinated debentures is measured at amortised cost.

The fair value of debentures in Thai Baht is calculated using the reference price in the secondary market of Thai Bond Market Association that are quoted in an active market and classified as level 2 fair value.

The fair value of debentures in US Dollar is calculated using the reference observable price in the secondary market of foreign bond that are quoted in an active market and classified as level 2 fair value.

The fair value of long-term loans to related parties is calculated by the discounted cash flow method using the reference discount rate in the market and classified as level 3 fair value.

The fair value of the following financial assets and liabilities approximates their book value.

The book value of long-term loans approximates their fair value, since their interest rates are close to market rate.

Consolidated financial statements	Separate financial statements
Financial assets • Cash and cash equivalents • Short-term investments • Trade and other receivables • Other current assets • Long-term loans to related parties • Other non-current financial assets • Other non-current assets	Financial assets • Cash and cash equivalents • Short-term investments • Trade and other receivables • Short-term loans to related parties • Other current assets • Other non-current assets
Financial liabilities • Trade and other payable • Lease liabilities • Other current liabilities • Long-term loans	Financial liabilities • Trade and other payable • Lease liabilities • Other current liabilities

Book value of the above financial assets and liabilities is measured at amortised cost.

11 Cash and cash equivalents

Cash and cash equivalents comprised:

Consolidated financial statements				
Unit: Million US Dollar			Unit: Million Baht	
31 December	31 December	31 December	31 December	
2021	2020	2021	2020	
Cash and bank deposits	1,756	1,223	58,681	36,725
Cash equivalents				
Fixed deposits with banks	803	2,443	26,841	73,396
Treasury bill with maturity not over than 3 months	-	38	-	1,131
Money market funds	-	-	6	5
Total cash and cash equivalents	2,559	3,704	85,528	111,257

Separate financial statements				
Unit: Million US Dollar			Unit: Million Baht	
31 December	31 December	31 December	31 December	
2021	2020	2021	2020	
Cash and bank deposits	298	289	9,968	8,683
Cash equivalents				
Fixed deposits with banks	490	830	16,376	24,931
Money market funds	-	-	6	5
Total cash and cash equivalents	788	1,119	26,350	33,619

12 Trade and other receivables

Consolidated financial statements				
Unit: Million US Dollar			Unit: Million Baht	
31 December	31 December	31 December	31 December	
2021	2020	2021	2020	
Trade receivables, net (Note 15)	796	572	26,613	17,186
Other receivables, net	204	219	6,817	6,566
Total trade and other receivables, net	1,000	791	33,430	23,752

Separate financial statements				
Unit: Million US Dollar			Unit: Million Baht	
31 December	31 December	31 December	31 December	
2021	2020	2021	2020	
Trade receivables, net (Note 15)	311	280	10,377	8,411
Other receivables, net	301	186	10,066	5,597
Total trade and other receivables, net	612	466	20,443	14,008

Aging of trade receivables can be analysed as follows:

	Consolidated financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	31 December 2021	31 December 2020	31 December 2021	31 December 2020
Not yet due	769	538	25,726	16,168
Over due				
- Up to 3 months	-	4	-	108
- Over 3 months but not over 6 months	-	-	-	9
- Over 6 months but not over 12 months	-	-	-	-
- Over 12 months	28	31	920	934
	797	573	26,646	17,219
<u>Less</u> Loss allowance from impairment	(1)	(1)	(33)	(33)
Total	796	572	26,613	17,186

		Separate financial statements			
		Unit: Million US Dollar		Unit: Million Baht	
		31 December 2021	31 December 2020	31 December 2021	31 December 2020
Not yet due		284	251	9,492	7,524
Over due					
- Up to 3 months		-	-	-	2
- Over 3 months but not over 6 months		-	-	-	1
- Over 6 months but not over 12 months		-	-	-	-
- Over 12 months		28	30	918	917
		312	281	10,410	8,444
<u>Less</u> Loss allowance from impairment		(1)	(1)	(33)	(33)
Total		311	280	10,377	8,411

Due to the short-term nature of the current receivables, their carrying amount is considered to be the same as their fair values.

13 Other current financial assets

Other current financial assets comprised investments in fixed income fund. The movements of other current financial assets for the year ended 31 December are as follows:

	Consolidated financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
Opening book value	-	214	-	6,444
Increase	368	423	11,771	13,230
Decrease	(367)	(622)	(11,724)	(19,450)
Loss from change in fair value	-	(1)	-	(26)
Foreign exchange differences	(1)	(14)	(47)	(438)
Currency translation differences	-	-	-	240
Closing book value	-	-	-	-

	Separate financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
Opening book value	-	-	-	6
Increase	-	50	-	1,564
Decrease	-	(50)	-	(1,570)
Closing book value	-	-	-	-

Other current financial assets above is financial assets at fair value through profit or loss (FVPL). The Group's exposure on credit risk is related to investment in debt measured at FVPL.

14 Inventories

Consolidated financial statements				
Unit: Million US Dollar			Unit: Million Baht	
31 December	31 December	31 December	31 December	
2021	2020	2021	2020	
Inventory	36	24	1,217	728
Materials and supplies	426	352	14,237	10,566
	462	376	15,454	11,294
<u>Less</u> Allowance for net realisable value	-	(1)	-	(26)
Allowance for slow moving and obsolete	(41)	(37)	(1,385)	(1,112)
	(41)	(38)	(1,385)	(1,138)
Total	421	338	14,069	10,156

Separate financial statements				
Unit: Million US Dollar			Unit: Million Baht	
31 December	31 December	31 December	31 December	
2021	2020	2021	2020	
Inventory	5	3	159	93
Materials and supplies	138	116	4,617	3,474
	143	119	4,776	3,567
<u>Less</u> Allowance for slow moving and obsolete	(23)	(19)	(762)	(577)
Total	120	100	4,014	2,990

15 Significant transactions with related parties

Enterprises or individuals that directly, or indirectly through one or more intermediaries, control, or are controlled by, or are under common control with, the Company, including holding companies, subsidiaries and fellow subsidiaries are related parties of the Company. Associates and individuals owning, directly or indirectly, an interest in the voting power of the Company that gives them significant influence over the enterprise, key management personnel, directors and close members of the family of these individuals and companies associated with these individuals also constitute related parties.

In considering each possible related party relationship, the Company's attention is directed to the substance of the relationship, and not merely the legal form.

PTT Public Company Limited, a company registered in Thailand, is the major shareholder of the Company held in proportion of 63.79% of the shareholding interest. General public held the remaining shares.

Other related parties include major shareholders, associates and joint ventures of the Company, which have control in other related parties.

The pricing policies for transactions between parent company, subsidiaries, associates, joint ventures, joint operations and related parties are as follows:

- Sales are set based on market price.
- Interest income is calculated using weighted average cost of debt plus profit markup.
- The prices of purchases and services charged are in accordance with the conditions in the agreement.
- Rental expenses are set based on price in the agreement.
- Other expenses comprise management and service fees charged to the parent company, subsidiaries and related parties for rendering the management services in the normal course of business. The fees are based on the service costs plus profit markup.

Significant transactions with related parties are summarised as follows:

a) Transactions with related parties

Transactions with related parties for the year ended 31 December are as follows:

	Consolidated financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
Parent company				
Revenue from sales	4,712	3,811	151,070	119,057
Other income	5	4	159	139
Purchase and other expenses	6	21	190	647
Subsidiaries, associates, joint ventures and joint operations				
Interest income	-	-	6	15
Other income	2	2	61	69
Dividend income	41	27	1,301	838
Rental and service expenses	49	46	1,552	1,427
Other related parties				
Revenue from sales	140	80	4,434	2,486
Other income	1	-	18	13
Purchase and other expenses	67	39	2,126	1,204
Interest income	1	2	31	72

		Separate financial statements			
		Unit: Million US Dollar		Unit: Million Baht	
		2021	2020	2021	2020
Parent company					
Revenue from sales		3,115	2,588	99,763	80,825
Other income		2	2	69	63
Purchase and other expenses		5	20	148	619
Subsidiaries, associates, joint ventures and joint operations					
Interest income		367	239	11,719	7,496
Other income		2	2	71	78
Dividend income		72	29	2,293	905
Rental and service expenses		47	44	1,496	1,367
Other related parties					
Other income		1	-	18	11
Purchase and other expenses		33	22	1,053	677

b) **Account receivable - related parties**

Account receivable - related parties comprised:

		Consolidated financial statements			
		Unit: Million US Dollar		Unit: Million Baht	
		31 December 2021	31 December 2020	31 December 2021	31 December 2020
Parent company		503	424	16,817	12,747

	Separate financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	31 December 2021	31 December 2020	31 December 2021	31 December 2020
Parent company	310	279	10,353	8,385

c) Short-term loans to related parties

Short-term loans to related parties comprised:

	Separate financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	31 December 2021	31 December 2020	31 December 2021	31 December 2020
Subsidiary	527	78	17,622	2,352

The Company has provided loans to a subsidiary for the year ended 31 December 2021 with an interest rate of 0.05% per annum (2020: interest rate is 0.05% per annum).

d) Long-term loans to related parties

Long-term loans to related parties comprised:

	Consolidated financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	31 December 2021	31 December 2020	31 December 2021	31 December 2020
Associate	-	16	-	467
Other related party	42	59	1,387	1,784
	42	75	1,387	2,251

	Separate financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	31 December 2021	31 December 2020	31 December 2021	31 December 2020
Subsidiary	6,441	6,780	215,252	203,664
Associate	-	16	-	467
	6,441	6,796	215,252	204,131

The Company has provided loans to a subsidiary for the year ended 31 December 2021 with an interest rate of 5.48% per annum (2020: interest rate is 3.54% per annum). The borrower shall make the repayment notice within this loan term which is over than 1 year.

The Company has provided loans to an associate for the year ended 31 December 2021 with an interest rate of 2.40% - 2.50% per annum (2020: interest rate is 2.50% - 3.35% per annum).

The Group has provided loans to another related party for the year ended 31 December 2021 with an interest rate of 1.96% - 2.06% per annum (2020: interest rate is 2.17% - 3.71% per annum).

The movements of the long-term loans to related parties for the year are as follows:

	Consolidated financial statements		Separate financial statements	
	Unit: Million US Dollar	Unit: Million Baht	Unit: Million US Dollar	Unit: Million Baht
Balance as at 1 January 2021	75	2,251	6,796	204,131
Increase	-	-	-	-
Decrease	(33)	(1,059)	(355)	(11,329)
Foreign exchange differences	-	(9)	-	(9)
Currency translation differences	-	204	-	22,459
Balance as at 31 December 2021	42	1,387	6,441	215,252

Loans to related parties

Loans to related parties measured at amortised cost are considered to have low credit risk, and the expected credit loss in the following 12 months and lifetime expected credit losses of the loans from increasing in credit risk is insignificant.

e) **Director and executive management fees**

Director and executive management fees for the year ended 31 December are as follows:

Consolidated financial statements				
Unit: Million US Dollar		Unit: Million Baht		
2021	2020	2021	2020	
Short-term benefits	7	7	233	214
Post-employment and other long-term benefits	-	-	12	15
	7	7	245	229

Separate financial statements				
Unit: Million US Dollar		Unit: Million Baht		
2021	2020	2021	2020	
Short-term benefits	7	7	232	214
Post-employment and other long-term benefits	-	-	12	15
	7	7	244	229

16 Investments in subsidiaries, associates, joint ventures and joint operations

The amounts of investments recognised in the statement of financial position are as follows:

	Consolidated financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	31 December	31 December	31 December	31 December
	2021	2020	2021	2020
Investments in associates	221	217	7,382	6,514
Investments in joint ventures	210	233	7,026	7,009
Total	431	450	14,408	13,523

	Separate financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	31 December	31 December	31 December	31 December
	2021	2020	2021	2020
Investments in associates	2,485	1,082	83,041	32,511
Investments in joint ventures	26	26	855	768
Total	2,511	1,108	83,896	33,279

16.1 Investments in subsidiaries

Changes of investments in subsidiaries during the year are as follows:

	Separate financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
For the year ended 31 December				
Opening book value	1,082	924	32,511	27,874
Increase in investments	1,403	158	44,771	4,941
Currency translation differences	-	-	5,759	(304)
Closing book value	2,485	1,082	83,041	32,511

On 22 January 2021, PTTEP Energy Holding (Thailand) Company Limited (PTTEP EH), a subsidiary of the Company, increased its authorised share capital amounting to Baht 2,017 million by issuing 20.17 million new ordinary shares at a par value of Baht 100 each. The Company paid the share subscription according to the Company's shareholding portion with an amount equivalent to US Dollar 67.30 million.

On 29 March 2021, PTTEP HK Holding Limited (PTTEP HK), a subsidiary of the Company, increased its authorised share capital of Hong Kong Dollar (HK Dollar) 13,094.97 million by increasing its par value to be HK Dollar 1.47 million per share. The Company paid the share subscription according to the Company's shareholding portion with an amount equivalent to US Dollar 421.60 million.

On 27 May 2021, PTTEP EH increased its authorised share capital amounting to Baht 600 million by issuing 6 million new ordinary shares at a par value of Baht 100 each. The Company paid the share subscription according to the Company's shareholding portion with an amount equivalent to US Dollar 19.17 million.

On 28 June 2021, PTTEP EH increased its authorised share capital amounting to Baht 3,956 million by issuing 39.56 million new ordinary shares at a par value of Baht 100 each. The Company paid the share subscription according to the Company's shareholding portion with an amount equivalent to US Dollar 126.79 million.

On 17 August 2021, PTTEP HK increased its authorised share capital of Hong Kong Dollar (HK Dollar) 155.78 million by increasing its par value to be HK Dollar 1.48 million per share. The Company paid the share subscription according to the Company's shareholding portion with an amount equivalent to US Dollar 5 million.

On 3 September 2021, EP-Tech Ventures Holding Company Limited (EP-Tech) established Asia Power and Transportation SG Holding PTE. LTD. (APT) with a registered capital amount to US Dollar 0.05 million comprises 0.05 million ordinary shares at a par value of US Dollar 1 each. EP-Tech holds 100% interest in APT and paid-up all shares on 20 January 2022. The Group classifies the investment in APT as an investment in a subsidiary.

On 6 September 2021, APT, established Delta Gas Transportaion SG Holding PTE. LTD. (DGH) with a registered capital of US Dollar 0.05 million. The registered capital comprises 0.05 million ordinary shares at a par value of US Dollar 1 each. APT holds 100% interest in DGH and paid-up all shares on 20 January 2022. The Group classifies the investment in DGH as an investment in a subsidiary.

On 21 September 2021, ARV established Rovula (Thailand) Co., Ltd. (Rovula) with a registered capital of Baht 1 million. The registered capital comprises 0.1 million ordinary shares at a par value of Baht 10 each. ARV holds 100% interest in Rovula. Its registered shares were fully paid with an amount equivalent to US Dollar 0.03 million. The Group classifies the investment in Rovula as an investment in a subsidiary.

On 21 September 2021, ARV established Skyller Solutions Co., Ltd. (Skyller) with a registered capital of Baht 1 million. The registered capital comprises 0.1 million ordinary shares at a par value of Baht 10 each. ARV holds 100% interest in Skyller. Its registered shares were fully paid with an amount equivalent to US Dollar 0.03 million. The Group classifies the investment in Skyller as an investment in a subsidiary.

On 21 September 2021, ARV established Varuna (Thailand) Co., Ltd. (Varuna) with a registered capital of Baht 1 million. The registered capital comprises 0.1 million ordinary shares at a par value of Baht 10 each. ARV holds 100% interest in Varuna. Its registered shares were fully paid with an amount equivalent to US Dollar 0.03 million. The Group classifies the investment in Varuna as an investment in a subsidiary.

On 21 September 2021, ARV established Cariva (Thailand) Co., Ltd. (Cariva) with a registered capital of Baht 1 million. The registered capital comprises 0.1 million ordinary shares at a par value of Baht 10 each. ARV holds 100% interest in Cariva. Its registered shares were fully paid with an amount equivalent to US Dollar 0.03 million. The Group classifies the investment in Cariva as an investment in a subsidiary.

On 26 October 2021, DGH established Delta Gas Transportation Limited (DGT) with a registered capital of US Dollar 0.05 million. The registered capital comprises 0.05 million ordinary shares at a par value of US Dollar 1 each. DGH holds 100% interest in DGT and fully paid up shares on 20 January 2022. The Group classifies the investment in DGT as an investment in a subsidiary.

On 26 October 2021, EP-Tech established FutureTech Energy Ventures Co., Ltd. (FEV) with a registered capital of Baht 5 million. The registered capital comprises 0.05 million ordinary shares at a par value of Baht 100 each. EP-Tech holds 100% interest in FEV. Its register shares were fully paid with an amount equivalent to US Dollar 0.15 million. The Group classifies the investment in FEV as an investment in a subsidiary.

On 27 October 2021, FEV established FutureTech Solar (Thailand) Co., Ltd. (FST) with a registered capital of Baht 1 million. The registered capital comprises 0.01 million ordinary shares at a par value of Baht 100 each. FEV holds 100% interest in FST. Its register shares were fully paid with an amount equivalent to US Dollar 0.03 million. The Group classifies the investment in FST as an investment in a subsidiary.

On 22 November 2021, PTTEP EH increased its authorised share capital amounting to Baht 25,338.89 million by issuing 253.39 million new ordinary shares at a par value of Baht 100 each. The Company paid the share subscription according to the Company's shareholding portion with an amount equivalent to US Dollar 762.55 million.

Details of investments in subsidiaries of the Company are as follows:

List of subsidiaries	Country of incorporation	Type of business	Participating interest (%)		Participating interest (%)		Separate financial statements (Cost method)					
			(including direct holding)		(including indirect holding)		Unit: Million US Dollar		Unit: Million Baht		2020	2020
			31 December 2021	31 December 2021	31 December 2021	31 December 2020	31 December 2021	31 December 2020	31 December 2021	31 December 2020		
PTTEP International Limited (PTTEPI)	Thailand	Petroleum	100	100	-	-	516	516	17,257	15,511		
PTTEP Services Limited (PTTEP Services)	Thailand	Human resource support	25	25	75	75	-	-	3	2		
PTTEP Siam Limited (PTTEPS)	Thailand	Petroleum	51	51	49	49	100	100	3,335	2,997		
PTTEP Offshore Investment Company Limited (PTTEPO)	Cayman Islands	Petroleum	75	75	25	25	-	-	-	-		
PTTEP HK Holding Limited (PTTEP HK)	Hong Kong	Petroleum	25	25	75	75	479	52	16,008	1,574		
PTTEP Treasury Center Company Limited (PTTEP TC)	Thailand	Treasury center for the Group's business	25	25	75	75	-	-	2	2		
PTTEP Energy Holding (Thailand) Company Limited (PTTEP EH)	Thailand	Petroleum	100	100	-	-	1,390	414	46,436	12,425		

Investments in subsidiaries of the Company for the consolidated financial statements are as follows:

List of subsidiaries	Country of incorporation	Type of business	Participating interest (%) (including indirect holding)	
			31 December 2021	31 December 2020
PTTEP Business Center Company Limited (PTTEP BC)	Thailand	Petroleum	100	100
PTTEP Energy Development Company Limited (PTTEP ED)	Thailand	Petroleum	100	100
EP-Tech Ventures Holding Company Limited (EP-Tech)	Thailand	Petroleum related Technology	100	100
AI and Robotics Ventures Company Limited (ARV)	Thailand	Technology	100	100
PTTEP Southwest Vietnam Company Limited (PTTEP SV)	Cayman Islands	Petroleum	100	100
PTTEP Kim Long Vietnam Company Limited (PTTEP KV)	Cayman Islands	Petroleum	100	100
PTTEP Hoang-Long Company Limited (PTTEP HL)	Cayman Islands	Petroleum	100	100
PTTEP Hoan-Vu Company Limited (PTTEP HV)	Cayman Islands	Petroleum	100	100
PTTEP Algeria Company Limited (PTTEP AG)	Cayman Islands	Petroleum	100	100
PTTEP Holding Company Limited (PTTEPH)	Cayman Islands	Petroleum	100	100
PTTEP Indonesia Company Limited (PTTEP ID)	Cayman Islands	Petroleum	100	100
PTTEP Africa Investment Limited (PTTEP AI)	Cayman Islands	Petroleum	100	100
PTTEP Australia Pty Ltd (PTTEP AU)	Commonwealth of Australia	Petroleum	100	100
PTTEP Australia Offshore Pty Ltd (PTTEP AO)	Commonwealth of Australia	Petroleum	100	100
PTTEP South Asia Limited (PTTEP SA)	Cayman Islands	Petroleum	100	100
PTTEP Semai II Limited (PTTEP SM) ¹	Cayman Islands	Petroleum	100	100
PTTEP Australia Perth Pty Ltd (PTTEP AP)	Commonwealth of Australia	Petroleum	100	100
PTTEP Australia Browse Basin Pty Ltd (PTTEP AB)	Commonwealth of Australia	Petroleum	100	100
PTTEP Australia Timor Sea Pty Ltd (PTTEP AT)	Commonwealth of Australia	Petroleum	100	100
PTTEP Australasia (Operations) Pty Ltd (PTTEP AAO)	Commonwealth of Australia	Petroleum	100	100
PTTEP Australasia (Ashmore Cartier) Pty Ltd (PTTEP AAA)	Commonwealth of Australia	Petroleum	100	100
PTTEP Australasia (Staff) Pty Ltd (PTTEP AAS)	Commonwealth of Australia	Petroleum	100	100

List of subsidiaries	Country of incorporation	Type of business	Participating interest (%) (including indirect holding)	
			31 December 2021	31 December 2020
PTTEP International Holding Company Limited (PTTEP IH)	Cayman Islands	Petroleum	100	100
PTTEP Southwest Vietnam Pipeline Company Limited (PTTEP SVPC)	Cayman Islands	Gas pipeline transportation	100	100
PTTEP FLNG Holding Company Limited (PTTEP FH) ²	Hong Kong	Petroleum	100	100
PTTEP Netherland Holding Limited (PTTEP NL)	Cayman Islands	Petroleum	100	100
JV Marine Limited (JV Marine)	Cayman Islands	Petroleum	100	100
PTTEP South Mandar Limited (PTTEP SMD)	Cayman Islands	Petroleum	100	100
PTTEP South Sageri Limited (PTTEP SS)	Cayman Islands	Petroleum	100	100
PTTEP Sadang Limited (PTTEP SD) ³	Cayman Islands	Petroleum	100	100
PTTEP Malunda Limited (PTTEP ML)	Cayman Islands	Petroleum	100	100
PTTEP Netherlands Coöperatie U.A. (PTTEP NC)	Netherlands	Petroleum	100	100
PTTEP Canada Limited (PTTEP CA)	Canada	Petroleum	100	100
PTTEP Canada International Finance Limited (PTTEP CIF)	Canada	Investment funding for the Group's business	100	100
Cove Energy Limited (Cove)	United Kingdom of Great Britain and Northern Ireland	Petroleum	100	100
Cove Energy Mozambique Rovuma Onshore Limited (CEMROL) ⁴	Republic of Cyprus	Petroleum	-	100
Cove Energy East Africa Limited (CEEAL)	Republic of Cyprus	Petroleum	100	100
PTTEP Mozambique Area 1 Limited (PTTEP MZA1)	Republic of Cyprus	Petroleum	100	100
PTTEP Netherlands Holding Coöperatie U.A. (PTTEP NH)	Netherlands	Petroleum	100	100
PTTEP Brazil Investment B.V. (PTTEP BI)	Netherlands	Petroleum	100	100
PTTEP Brazil Investments in Oil and Gas Exploration and Production Limitada (PTTEP BL)	Federative Republic of Brazil	Petroleum	100	100
Sinphuhorm Holdings Limited (SHL)	Cayman Islands	Petroleum	100	100
PTTEP SP Limited (PTTEP SP)	United Kingdom of Great Britain and Northern Ireland	Petroleum	100	100
PTTEP G7 Limited (PTTEP G7)	Thailand	Petroleum	100	100
PTTEP HK Offshore Limited (PTTEP HKO)	Hong Kong	Petroleum	100	100
PTTEP MENA Limited (PTTEP MENA)	Hong Kong	Petroleum	100	100
PTTEP Mexico E&P Limited, S. de R.L. de C.V. (PTTEP MEP)	Mexico	Petroleum	100	100
PTTEP Sabah Oil Limited (PTTEP SBO)	Bahamas	Petroleum	100	100

List of subsidiaries	Country of incorporation	Type of business	Participating interest (%) (including indirect holding)	
			31 December 2021	31 December 2020
PTTEP Sarawak Oil Limited (PTTEP SKO)	Bahamas	Petroleum	100	100
PTTEP Group Holding B.V. (PGH)	Netherlands	Petroleum	100	100
Partex Oil and Gas (Holdings) Corporation (POGHC) ⁵	Cayman Islands	Petroleum	-	100
PTTEP (Kazakhstan) Corporation (PKC)	Cayman Islands	Petroleum	100	100
PTTEP (Angola) Corporation (PANG)	Cayman Islands	Petroleum	100	100
Partex (Brazil) Corporation (PBC)	Cayman Islands	Petroleum	100	100
PTTEP Gas Corporation (PGC)	Republic of Panama	Petroleum	100	100
Partex Services Corporation (PSC)	Republic of Panama	Human resource support	100	100
Participations and Explorations Corporation (PEC)	Republic of Panama	Petroleum	100	100
PTTEP Oman E&P Corporation (POC) ⁶	Republic of Panama	Petroleum	100	100
Partex Services Portugal – Serviços para a Indústria Petrolífera, S.A. (PSP)	Portugal	Human resource support	100	100
Partex Brasil Ltda. (PBL) ⁷	Federative Republic of Brazil	Petroleum	-	100
Partex Brasil Operações Petrolíferas Ltda (PBO) ⁷	Federative Republic of Brazil	Human resource support	-	100
Asia Power and Transportation SG Holding PTE. LTD. (APT)	Singapore	Petroleum	100	-
Delta Gas Transportation SG Holding PTE. LTD. (DGH)	Singapore	Gas pipeline transportation	100	-
Delta Gas Transportation Limited (DGT)	Republic of the Union of Myanmar	Gas pipeline transportation	100	-
Rovula (Thailand) Co., Ltd. (Rovula)	Thailand	Technology	100	-
Skyller Solutions Co., Ltd. (Skyller)	Thailand	Technology	100	-
Varuna (Thailand) Co., Ltd. (Varuna)	Thailand	Technology	100	-
Cariva (Thailand) Co., Ltd. (Cariva)	Thailand	Technology	100	-
FutureTech Energy Ventures Co., Ltd. (FEV)	Thailand	Renewable energy and related new business	100	-
FutureTech Solar (Thailand) Co., Ltd. (FST)	Thailand	Solar power	100	-

- ¹ On 30 September 2021, PTTEP Semai II Company Limited (PTTEP SM), a subsidiary of the Group, received the approval for company dissolution from the registrar.
- ² On 30 June 2021, PTTEP FLNG Holding Company Limited (PTTEP FH), a subsidiary of the Group, has proceeded to dissolve the company. The dissolution will be effective after receiving the official announcement from the Hong Kong Government.
- ³ On 7 October 2021, PTTEP Sadang Limited (PTTEP SD), a subsidiary of the Group, received the approval for company dissolution from the registrar and is in the process of dissolution.
- ⁴ On 20 October 2021, Cove Energy Mozambique Rovuma Onshore Limited (CEMROL), a subsidiary of the Group, completed the dissolution and liquidation.
- ⁵ On 4 August 2021, Partex Oil and Gas (Holdings) Corporation (POGHC), a subsidiary of the Group, completed the dissolution and liquidation.
- ⁶ Held 5% interest in Gas Investments and Services Company Limited (GISCO). The Group classifies the investment in GISCO as an investment in an associate. As at 31 December 2021 and 2020, the book value is zero.
- ⁷ On 30 July 2021, Participations and Explorations Corporation (PEC) and Partex (Brazil) Corporation (PBC), subsidiaries of the Group, entered into a Sale and Purchase Agreement (SPA) to sell all shares of Partex Brasil Ltda. (PBL) and Partex Brasil Operações Petrolíferas Ltda. (PBO), which are registered in the Federative Republic of Brazil to Ubuntu Engenharia e Serviços Ltda. (Ubuntu). The sale was completed on 29 October 2021.

16.2 Investment in associates

Changes of investments in associates during the year are as follows:

	Consolidated financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
For the year ended 31 December				
Opening book value	217	228	6,514	6,864
Impact of adoption of TFRS 9	-	23	-	685
Share of net profit after income taxes	5	12	141	391
Dividends received	(4)	(3)	(119)	(90)
Share of other comprehensive income (expenses)				
- Remeasurement of employee benefits	-	-	2	(5)
- Measurement of financial assets	-	(44)	9	(1,390)
- Currency difference arising from translation of financial statements of associates	(9)	1	(267)	21
Increase in investments	12	-	391	-
Reclassification	-	-	-	9
Currency translation differences	-	-	711	29
Closing book value	221	217	7,382	6,514

	Separate financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
For the year ended 31 December				
Opening book value	26	26	768	771
Currency translation differences	-	-	87	(3)
Closing book value	26	26	855	768

Details of investment in associates of the Group and the Company are as follows:

List of associates ^{1, 2}	Country of incorporation	Type of business	Participating interest (%)		Consolidated financial statements (Equity method)					
			(including indirect holding)		Unit: Million US Dollar		Unit: Million Baht		31 December 2021	31 December 2020
			31 December 2021	31 December 2020	31 December 2021	31 December 2020	31 December 2021	31 December 2020		
Energy Complex Company Limited (Energy Complex)	Thailand	Property rental services	50	50	64	63	2,130	1,878		
PTT Digital Solutions Company Limited (PTT Digital)	Thailand	Information technology and communication services	20	20	17	16	569	493		
PTTEP AP Group's Associates ³	Commonwealth of Australia	Air base services	50	50	-	5	-	149		
PTT Global LNG Company Limited (PTT GL)	Thailand	Petroleum	50	50	127	129	4,258	3,883		
Leismer Aerodrome Limited (LAL)	Canada	Air transportation	32	32	-	4	-	111		
MoZ LNG1 Holding Company Ltd (HoldCo)	United Arab Emirates	Petroleum	8.5	8.5	13	-	425	-		

List of associates ^{1, 2}	Country of incorporation	Type of business	Participating interest (%)		Consolidated financial statements (Cost method)					
			(including indirect holding)		Unit: Million US Dollar		Unit: Million Baht			
			31 December 2021	31 December 2020	31 December 2021	31 December 2020	31 December 2021	31 December 2020	31 December 2021	31 December 2020
Energy Complex Company Limited (Energy Complex)	Thailand	Property rental services	50	50	25	25	829	745		
PTT Digital Solutions Company Limited (PTT Digital)	Thailand	Information technology and communication services	20	20	1	1	26	24		

¹ All investments in associates have been assessed as immaterial to the Group.

² The Group has no contingent liabilities with participating interest in investment in associates.

³ PTTEP AP's Group Associates are Mungalalu Truscott Airbase Pty Ltd and Troughton Island Pty Ltd.

Individually immaterial associates

The Group's immaterial associates accounted for using equity method are as follows:

	Unit: Million US Dollar		Unit: Million Baht	
	31 December 2021	31 December 2020	31 December 2021	31 December 2020
Aggregate carrying amount of share of individually immaterial associates	221	217	7,382	6,514

	Unit: Million US Dollar		Unit: Million Baht	
For the year ended 31 December	2021	2020	2021	2020
Aggregate amounts of the Group's share of associates:				
Profit from continuing operations	5	12	141	391
Other comprehensive income	(9)	(43)	(256)	(1,374)
Total comprehensive income for the year	(4)	(31)	(115)	(983)

On 2 February 2021, MoZ LNG1 Holding Company Ltd (HoldCo), an associate of the Group, increased its authorised share capital amounting to US Dollar 94 million by issuing of 94 million new ordinary shares at a par value of US Dollar 1 each. The Group paid the share subscription according to the Group's shareholding portion amounting to US Dollar 7.99 million.

On 6 May 2021, HoldCo increased its authorised share capital amounting to US Dollar 5 million by issuing of 5 million new ordinary shares at a par value of US Dollar 1 each. The Group paid the share subscription according to the Group's shareholding portion amounting to US Dollar 0.43 million.

On 4 August 2021, HoldCo increased its authorised share capital amounting to US Dollar 45 million by issuing 45 million new ordinary shares at a par value of Baht 1 each. The Group has paid-up shares in the Group's shareholding to US Dollar 3.83 million.

16.3 Investments in Joint Ventures

Changes of investments in Joint Ventures during the year are as follows:

	Consolidated financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
For the year ended 31 December				
Opening book value	233	225	7,009	6,796
Share of net profit after income taxes	11	29	347	916
Dividends received	(37)	(24)	(1,182)	(749)
Share of other comprehensive income				
- Currency differences arising from translation of financial statements of joint ventures	-	-	(1)	-
Increase in investments	3	3	104	98
Decrease in investment	-	-	-	(12)
Currency translation differences	-	-	749	(40)
Closing book value	210	233	7,026	7,009

On 11 January 2021, Zeaquest Company Limited (Zeaquest), a joint venture of the Group, increased its authorised share capital amounting to Baht 150 million by issuing of 1.5 million new ordinary shares at a par value of Baht 100 each. The Group paid the share subscription according to the Group's shareholding portion with an amount equivalent to US Dollar 2.54 million.

On 16 June 2021, ARV co-invested in AeroSky Solutions Co., Ltd. (AeroSky) with a registered capital of Baht 1 million. The registered capital comprises 0.01 million ordinary shares at a par value of Baht 100 each. ARV holds 33% interest in AeroSky and paid the share subscription at 25% of the registered shares with an amount equivalent to US Dollar 0.003 million. The Group classifies the investment in AeroSky as an investment in a joint venture.

On 9 July 2021, ATI Technologies Co., Ltd. (ATI), a joint venture of the Group, called for additional paid-up shares at the remaining 40% of its registered shares. The Group paid the share subscription according to the Group's shareholding portion with an amount equivalent to US Dollar 0.12 million.

On 2 September 2021, AeroSky, a joint venture of the Group, called for additional paid-up shares at the remaining 75% of its registered shares and increased its authorised share capital amounting to Baht 29 million. The registered capital comprises 0.29 million ordinary shares at a par value of Baht 100 each. The Group paid the share subscription according to the Group's shareholding portion with an amount equivalent to US Dollar 0.30 million.

Details of investments in joint ventures of the Group are as follows:

List of joint ventures ^{1, 2}	Country of incorporation	Type of business	Participating interest (%) (including indirect holding)		Consolidated financial statements (Equity method)					
					Unit: Million US Dollar			Unit: Million Baht		
			31 December 2021	31 December 2020	31 December 2021	31 December 2020	31 December 2021	31 December 2020	31 December 2021	31 December 2020
Erawan 2 FSO PTE. Ltd. ³ (Erawan 2 FSO PTE.)	Singapore	FSO rental services	13.11	13.11	37	41	1,238	1,236		
APICO LLC (APICO)	United States of America	Petroleum	72.8215	72.8215	123	129	4,125	3,863		
Oman LNG LLC (OLNG)	Sultanate of Oman	Petroleum	2	2	48	63	1,590	1,905		
ATI Technologies Company Limited (ATI)	Thailand	Technology	50	50	-	-	5	5		
Zeaquest Company Limited (Zeaquest)	Thailand	Technology	50	50	2	-	59	-		
AeroSky Solutions Co., Ltd. (AeroSky)	Thailand	Technology	33	-	-	-	9	-		

¹ All investments in joint ventures have been assessed as immaterial to the Group.

² The Group has no contingent liabilities with participating interest in investment in joint ventures.

³ Held 100% share capital in Asia PacificMarine Services (EF) B.V. and redomiciled from Bahamas to Singapore and changed its name to Erawan 2 FSO PTE. LTD. during the year 2021.

Individually immaterial joint ventures

The Group's immaterial joint ventures accounted for using equity method are as follows:

	Unit: Million US Dollar		Unit: Million Baht	
	31 December	31 December	31 December	31 December
	2021	2020	2021	2020
Aggregate carrying amount of share of individually immaterial joint ventures	210	223	7,026	7,009

	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
	2021	2020	2021	2020
For the year ended 31 December				
Aggregate amounts of the Group's share of joint ventures:				
Profit from continuing operations	11	29	347	916
Other comprehensive income	-	-	(1)	-
Total comprehensive income for the year	11	29	346	916

16.4 Investments in Joint Operations

Details of investments in joint operations of the Group are as follows:

List of joint operations	Country of incorporation	Type of business	Participating interest (%) (including indirect holding)	
			31 December 2021	31 December 2020
Carigali - PTTEPI Operating Company Sdn Bhd. (CPOC)	Malaysia	Petroleum	50	50
Moattama Gas Transportation Company (MGTC)	Bermuda	Gas pipeline transportation	25.5	25.5
Taninthayi Pipeline Company LLC (TPC)	Cayman Islands	Gas pipeline transportation	19.3178	19.3178
Orange Energy Limited (Orange)	Thailand	Petroleum	53.9496	53.9496
B8/32 Partners Limited (B8/32 Partners)	Thailand	Petroleum	25.0009	25.0009
Hoang-Long Joint Operating Company	Socialist Republic of Vietnam	Petroleum	28.5	28.5
Hoan-Vu Joint Operating Company	Socialist Republic of Vietnam	Petroleum	25	25
Groupement Bir Seba (GBRS)	People's Democratic Republic of Algeria	Petroleum	35	35
Andaman Transportation Limited (ATL)	Cayman Islands	Gas pipeline transportation	80	80
Natuna 2 B.V. (Natuna)	Netherlands	Petroleum	50	50
Petroleum Development Oman LLC (PDO)	Sultanate of Oman	Petroleum	2	2
Abu Dhabi Gas Industries Limited (AGP)	United Arab Emirates	Petroleum	2	2
Private Oil Holdings Oman Limited (POHOL)	United Kingdom of Great Britain and Northern Ireland	Petroleum	5	5
Petroleum Development Oman Services LLC (PDO-S) ¹	Sultanate of Oman	Petroleum	1.9998	-

¹ On 27 April 2021, Petroleum Development Oman LLC (PDO), a joint operation of the Group, co-established Petroleum Development Oman Services LLC (PDO-S) with a registered capital of Rial Omani 0.5 million. The registered capital comprises 0.5 million ordinary shares at a par value of Rial Omani 1 each. PDO holds 99.99% interest according to the Group's shareholding portion with an amount equivalent to US Dollar 0.03 million. The Group classifies the investment in PDO-S as an investment in a joint operation.

Details of exploration and production projects operated by the Group are as follows:

Project	Country	Operator	Participating interest (%)	
			31 December 2021	31 December 2020
PTT Exploration and Production Public Company Limited				
Bongkot	Thailand	PTT Exploration and Production Public Company Limited	66.6667	66.6667
Arthit	Thailand	PTT Exploration and Production Public Company Limited	80	80
Contract 4 (B12/27)	Thailand	Chevron Thailand Exploration and Production, Ltd.	45	45
Sinphuhorm (E5 North)	Thailand	PTTEP SP Limited	20	20
S1	Thailand	PTTEP Siam Limited	25	25
Contract 3 (B10, B11, B12 and B13)	Thailand	Chevron Thailand Exploration and Production, Ltd.	5	5
E5	Thailand	ExxonMobil Exploration and Production Khorat Inc.	20	20
Algeria Hassi Bir Rekaiz ¹	People's Democratic Republic of Algeria	PTT Exploration and Production Public Company Limited	49	24.5
PTTEP International Limited (PTTEPI)				
Yadana	Republic of the Union of Myanmar	TotalEnergies EP Myanmar	25.5	25.5
Yetagun	Republic of the Union of Myanmar	Petronas Carigali Myanmar (Hong Kong) Ltd.	19.31784	19.31784
PTTEP 1	Thailand	PTTEP International Limited	100	100
G4/43	Thailand	Chevron Offshore (Thailand) Ltd.	21.375	21.375
G9/43	Thailand - Kingdom of Cambodia	PTTEP International Limited	100	100
L22/43	Thailand	PTTEP International Limited	100	100
L53/43 & L54/43	Thailand	PTTEP International Limited	100	100
G4/48	Thailand	Chevron Pattani, Ltd.	5	5
Bongkot (G12/48)	Thailand	PTTEP International Limited	66.6667	66.6667
Contract 4 (G7/50)	Thailand	Chevron Pattani, Ltd.	60	60

Project	Country	Operator	Participating interest (%)	
			31 December 2021	31 December 2020
Arthit (G8/50)	Thailand	PTTEP International Limited	80	80
Zawtika	Republic of the Union of Myanmar	PTTEP International Limited	80	80
Myanmar M3 ²	Republic of the Union of Myanmar	PTTEP International Limited	100	80
Myanmar M11 ³	Republic of the Union of Myanmar	PTTEP International Limited	-	100
MTJDA	Thailand - Malaysia	Carigali-PTTEPI Operating Company Sdn Bhd.	50	50
PTTEP Offshore Investment Company Limited (PTTEPO)				
B8/32 & 9A ⁴	Thailand	Chevron Offshore (Thailand) Ltd.	25.001	25.001
PTTEP Southwest Vietnam Company Limited (PTTEP SV)				
Vietnam 52/97	Socialist Republic of Vietnam	Vietnam Oil and Gas Group	7	7
PTTEP Kim Long Vietnam Company Limited (PTTEP KV)				
Vietnam B & 48/95	Socialist Republic of Vietnam	Vietnam Oil and Gas Group	8.5	8.5
PTTEP Hoang-Long Company Limited (PTTEP HL)				
Vietnam 16-1	Socialist Republic of Vietnam	Hoang-Long Joint Operating Company	28.5	28.5
PTTEP Hoan-Vu Company Limited (PTTEP HV)				
Vietnam 9-2	Socialist Republic of Vietnam	Hoan-Vu Joint Operating Company	25	25
PTTEP Algeria Company Limited (PTTEP AG)				
Algeria 433A & 416B	People's Democratic Republic of Algeria	Groupement Bir Seba	35	35

Project	Country	Operator	Participating interest (%)	
			31 December 2021	31 December 2020
PTTEP Siam Limited (PTTEPS)				
Sinphuhorm (EU-1)	Thailand	PTTEP SP Limited	20	20
B6/27	Thailand	PTTEP Siam Limited	100	100
S1	Thailand	PTTEP Siam Limited	75	75
PTTEP South Asia Limited (PTTEP SA)				
Myanmar MD-7 ⁵	Republic of the Union of Myanmar	PTTEP South Asia Limited	50	50
Myanmar MOGE 3 ⁶	Republic of the Union of Myanmar	PTTEP South Asia Limited	-	77.5
PTTEP Canada Limited (PTTEP CA)				
Mariana Oil Sands	Canada	PTTEP Canada Limited	100	100
PTTEP Australia Perth Pty Ltd (PTTEP AP)				
PTTEP Australasia*	Commonwealth of Australia			

* Details of operators and participating interests in PTTEP Australasia Project are as follows:

Block	Operator	Participating interest (%)	
		31 December 2021	31 December 2020
AC/RL7, AC/RL12 and AC/P54	PTTEP Australasia (Ashmore Cartier) Pty Ltd	100	100
AC/L3 ⁷	PTTEP Australasia (Ashmore Cartier) Pty Ltd	100	100
AC/RL10	PTTEP Australia Timor Sea Pty Ltd	90	90
AC/RL4 (Tenacious)	PTTEP Australia Timor Sea Pty Ltd	100	100
AC/RL6 (Audacious), AC/RL6 (exclusive of Audacious)	PTTEP Australia Timor Sea Pty Ltd	100	100
AC/RL4 (exclusive of Tenacious)	PTTEP Australia Timor Sea Pty Ltd	100	100

Project	Country	Operator	Participating interest (%)	
			31 December 2021	31 December 2020
PTTEP Mozambique Area 1 Limited (PTTEP MZA1)				
Mozambique Area 1	Republic of Mozambique	TotalEnergies EP Mozambique Area 1 Limitada	8.5	8.5
Natuna 2 B.V. (Natuna)				
Natuna Sea A	Republic of Indonesia	Premier Oil Natuna Sea BV	11.5	11.5
PTTEP Brazil Investments in Oil and Gas Exploration and Production Limitada (PTTEP BL)				
Barreirinhas AP1	Federative Republic of Brazil	Shell Brasil Petroleo Ltda.	25	25
Brazil BM-ES-23	Federative Republic of Brazil	Petróleo Brasileiro S.A. (Petrobas)	20	20
PTTEP SP Limited (PTTEP SP)				
Contract 4 (B12/27)	Thailand	Chevron Thailand Exploration and Production, Ltd.	15	15
Sinphuhorm (E5 North and EU-1)	Thailand	PTTEP SP Limited	35	35
PTTEP HK Offshore Limited (PTTEP HKO)				
Sarawak SK 410B	Malaysia	PTTEP HK Offshore Limited	42.5	42.5
Sarawak SK 417	Malaysia	PTTEP HK Offshore Limited	80	80
Sarawak SK 438	Malaysia	PTTEP HK Offshore Limited	80	80
Peninsular PM 407	Malaysia	PTTEP HK Offshore Limited	55	55
Peninsular PM 415	Malaysia	PTTEP HK Offshore Limited	70	70
PTTEP Mexico E&P Limited, S. de R.L. de C.V. (PTTEP MEP)				
Mexico block 12 (2.4)	Mexico	PC Carigali Mexico Operations, S.A. de C.V.	20	20
Mexico block 29 (2.4)	Mexico	Repsol Exploración México, S.A. de C.V.	16.67	16.67

Project	Country	Operator	Participating interest (%)	
			31 December 2021	31 December 2020
PTTEP Energy Development Company Limited (PTTEP ED)				
G1/61	Thailand	PTTEP Energy Development Company Limited	60	60
G2/61	Thailand	PTTEP Energy Development Company Limited	100	100
PTTEP MENA Limited (PTTEP MENA)				
Abu Dhabi Offshore 1	United Arab Emirates	Eni Abu Dhabi B.V.	30	30
Abu Dhabi Offshore 2	United Arab Emirates	Eni Abu Dhabi B.V.	30	30
Oman Onshore Block 12	Sultanate of Oman	TotalEnergies EP Oman Block 12 B.V.	20	20
Abu Dhabi Offshore 3	United Arab Emirates	Eni Abu Dhabi B.V.	30	30
Oman Block 61 ⁸	Sultanate of Oman	BP Exploration (Epsilon) Limited (BP)	20	-
PTTEP Sabah Oil Limited (PTTEP SBO)				
Malaysia Block K ^{**}	Malaysia			
Malaysia Block H ^{***}	Malaysia			

^{**} Details of operators and participating interests in Malaysia Block K project are as follows:

Block	Operator	Participating interest (%)	
		31 December 2021	31 December 2020
Kikeh	PTTEP Sabah Oil Limited	56	56
SNP	PTTEP Sabah Oil Limited	22.4	22.4
GK ⁹	Sabah Shell Petroleum Co., Ltd.	7.1657292	6.366

*** Details of operators and participating interests in Malaysia Block H project are as follows:

Block	Operator	Participating interest (%)	
		31 December 2021	31 December 2020
Rotan	PTTEP Sabah Oil Limited	56	56
Others	PTTEP Sabah Oil Limited	42	42

Project	Country	Operator	Participating interest (%)	
			31 December 2021	31 December 2020
PTTEP Sarawak Oil Limited (PTTEP SKO)				
Sarawak SK 314A	Malaysia	PTTEP Sarawak Oil Limited	59.5	59.5
Sarawak SK 405B	Malaysia	PTTEP Sarawak Oil Limited	59.5	59.5
Sarawak SK 309 and SK 311 ****	Malaysia			

**** Details of operators and participating interests in Sarawak SK 309 and Sarawak SK 311 projects are as follows:

Block	Operator	Participating interest (%)	
		31 December 2021	31 December 2020
East Patricia	PTTEP Sarawak Oil Limited	42	42
Others	PTTEP Sarawak Oil Limited	59.5	59.5

Project	Country	Operator	Participating interest (%)	
			31 December 2021	31 December 2020
PTTEP Holding Group B.V. (PGH)				
Block 17/06	Angola	TotalEnergies E&P Angola Block 17.06 (TEPA)	2.5	2.5
Potiguar ¹⁰	Federative Republic of Brazil	Partex Brasil Ltda	-	50
Dunga	Kazakhstan	Total E&P Dunga GmbH	20	20
PDO (Block 6)	Sultanate of Oman	Petroleum Development Oman LLC	2	2
Mukhaizna (Block 53)	Sultanate of Oman	Occidental Mukhaizna,LLC	1	1

¹ On 1 September 2021, the Company, as an operator of Algeria Hassi Bir Rekaiz (the Project) in People's Democratic Republic of Algeria, received an approval from the Government of People's Democratic Republic of Algeria to acquire the 24.5% shareholding interest in the Project from CNOOC Limited (CNOOC), a joint partner with a total value of US Dollar 82.84 million (Baht 2,675.98 million). As a result, the Company has increased its shareholding interest to 49% in the project. The acquisition of the shareholding interest is an asset acquisition because substantially all of the fair value of the gross assets acquired is concentrated in the exploration and production assets. Therefore, the Company recognised the asset acquisition transaction as property, plant and equipment amounting to US Dollar 75.26 million (Baht 2,430.89 million), cash and cash equivalents amounting to US Dollar 11.97 million (Baht 386.58 million) and the remainings were recognised as relevant assets and liabilities.

² On 17 September 2021, Mitsui Oil Exploration Company Limited (MOECO), a joint partner of Myanmar M3 project, notified to withdraw its shareholding interest at 20%. The withdrawal will be effective on 31 October 2021 according to the Joint Operating Agreement. As a result, the participating interest of PTTEP International Limited (PTTEPI), a subsidiary of the Company and the operator of Myanmar M3 project, will change from 80% to 100%. However, the completion of the withdrawal is subject to the approval from the Government of the Republic of the Union of Myanmar.

³ On 22 November 2021, PTTEPI entered into a Termination Agreement with the Government of the Republic of the Union of Myanmar to terminate and return the exploration blocks of Myanmar M11 project after fulfillment of the requirements of the Production Sharing Contract. The agreement becomes legally binding upon the signatures.

⁴ PTTEP Offshore Investment Company Limited (PTTEPO) has shareholding interest in Orange Energy Limited and B8/32 Partners Limited, which hold the project's concession.

⁵ On 14 October 2020, PTTEP South Asia Limited (PTTEP SA), a subsidiary of the Group, submitted a request to terminate and return 50% of the exploration block of Myanmar MD-7 Project after fulfilling the obligations under the Product Sharing Contract earlier than termination exploration period identified per the contract (14 November 2021). The termination will be effective upon receiving official approval from the Government of the Republic of the Union of Myanmar.

- ⁶ On 24 November 2021, PTTEP SA entered into a Termination Agreement with the Government of the Republic of the Union of Myanmar to terminate and return the exploration blocks of Myanmar MOGE 3 project after fulfillment of the requirements of the Production Sharing Contract. The agreement becomes legally binding upon the signatures.
- ⁷ On 19 November 2021, PTTEP Australasia (Ashmore Cartier) Pty Ltd (PTTEP AAA) submitted a request to terminate and return the exploration block of AC/L3 Project. The termination will be effective after receiving the official approval from the Government of the Commonwealth of Australia (Australia).
- ⁸ On 1 February 2021, PTTEP MENA Limited (PTTEP MENA), a subsidiary of the Group, signed a Sale and Purchase Agreement (SPA) to acquire the 20% interests in Block 61 Sultanate of Oman (Oman Block 61) from BP Exploration (Epsilon) Limited (BP). The acquisition was completed on 23 March 2021. This investment is an investment in a joint operation.
- ⁹ On 15 March 2021, PTTEP Sabah Oil Limited (PTTEP SBO), a subsidiary of the Group, received redetermination approval of Block GK under Malaysia Block K project from Malaysian Government. The participating interest increased from 6.366% to 6.555% which retrospectively effective from 1 January 2020 onwards on 30 December 2021. Sabah Shell Petroleum Company Limited (SSPC), the operator of Block GK, received redetermination approval of Block GK under Malaysia Block K project from Malaysian Government in accordance to Unitisation and Unit Operating Agreement (UUOA) which affected to participating interest of PTTEP Sabah Oil Limited (PTTEP SBO), a subsidiary of the Group, increased from 6.555% to 7.1657292%.
- ¹⁰ On 30 July 2021, Participations and Explorations Corporation (PEC) and Partex (Brazil) Corporation (PBC), subsidiaries of the Group, entered into a Sale and Purchase Agreement (SPA) to sell all shares of Partex Brasil Ltda. (PBL) and Partex Brasil Operações Petrolíferas Ltda. (PBO), which are registered in the Federative Republic of Brazil to Ubuntu Engenharia e Serviços Ltda. (Ubuntu). The sale was completed on 29 October 2021.

17 Property, plant and equipment

Consolidated financial statements					
Unit: Million US Dollar					
	Exploration and production assets	Pipeline	Others	Assets under construction	Total
As at 1 January 2020					
Cost	28,654	893	144	1,478	31,169
<u>Less</u> Accumulated depreciation	(19,930)	(278)	(86)	-	(20,294)
<u>Less</u> Accumulated impairment	(330)	(5)	-	-	(335)
Net book value	8,394	610	58	1,478	10,540
For the year ended 31 December 2020					
Opening net book value	8,394	610	58	1,478	10,540
Additions	541	2	12	851	1,406
Disposals and write-off, net	(64)	-	(3)	(32)	(99)
Reclassification	294	-	-	(277)	17
Depreciation charged	(1,934)	(30)	(14)	-	(1,978)
Allowance for impairment of assets	(48)	-	-	-	(48)
Closing net book value	7,183	582	53	2,020	9,838
As at 31 December 2020					
Cost	28,968	896	153	2,020	32,037
<u>Less</u> Accumulated depreciation	(21,423)	(308)	(100)	-	(21,831)
<u>Less</u> Accumulated impairment	(362)	(6)	-	-	(368)
Net book value	7,183	582	53	2,020	9,838

Consolidated financial statements					
Unit: Million US Dollar					
	Exploration and production assets	Pipeline	Others	Assets under construction	Total
For the year ended 31 December 2021					
Opening net book value	7,183	582	53	2,020	9,838
Business acquisition	1,862	-	-	304	2,166
Additions	705	1	5	1,267	1,978
Disposals and write-off, net	(385)	(2)	(1)	(28)	(416)
Reclassification	674	-	1	(631)	44
Depreciation charged	(2,170)	(30)	(10)	-	(2,210)
Allowance for impairment of assets	(14)	(6)	-	-	(20)
Closing net book value	7,855	545	48	2,932	11,380
As at 31 December 2021					
Cost	31,583	894	153	2,932	35,562
<u>Less</u> Accumulated depreciation	(23,367)	(338)	(105)	-	(23,810)
<u>Less</u> Accumulated impairment	(361)	(11)	-	-	(372)
Net book value	7,855	545	48	2,932	11,380

Consolidated financial statements					
Unit: Million Baht					
	Exploration and production assets	Pipeline	Others	Assets under construction	Total
As at 1 January 2020					
Cost	864,044	26,944	4,338	44,558	939,884
<u>Less</u> Accumulated depreciation	(600,980)	(8,390)	(2,599)	-	(611,969)
<u>Less</u> Accumulated impairment	(9,947)	(158)	-	-	(10,105)
Net book value	253,117	18,396	1,739	44,558	317,810
For the year ended 31 December 2020					
Opening net book value	253,117	18,396	1,739	44,558	317,810
Additions	16,922	66	378	26,615	43,981
Disposals and write-off, net	(2,012)	-	(90)	(979)	(3,081)
Reclassification	9,185	-	9	(8,667)	527
Depreciation charged	(60,513)	(934)	(447)	-	(61,894)
Allowance for impairment of assets	(1,434)	(12)	-	-	(1,446)
Currency translation differences	476	(37)	(1)	(844)	(406)
Closing net book value	215,741	17,479	1,588	60,683	295,491
As at 31 December 2020					
Cost	870,110	26,903	4,584	60,683	962,280
<u>Less</u> Accumulated depreciation	(643,493)	(9,254)	(2,996)	-	(655,743)
<u>Less</u> Accumulated impairment	(10,876)	(170)	-	-	(11,046)
Net book value	215,741	17,479	1,588	60,683	295,491

Consolidated financial statements					
Unit: Million Baht					
	Exploration and production assets	Pipeline	Others	Assets under construction	Total
For the year ended 31 December 2021					
Opening net book value	215,741	17,479	1,588	60,683	295,491
Business acquisition	59,651	-	-	9,730	69,381
Additions	22,517	19	181	40,455	63,172
Disposals and write-off, net	(12,298)	(72)	(39)	(894)	(13,303)
Reclassification	21,535	-	24	(20,146)	1,413
Depreciation charged	(69,373)	(954)	(317)	-	(70,644)
Allowance for impairment of assets	(470)	(201)	-	-	(671)
Currency translation differences	25,214	1,924	167	8,163	35,468
Closing net book value	262,517	18,195	1,604	97,991	380,307
As at 31 December 2021					
Cost	1,055,511	29,878	5,106	97,991	1,188,486
<u>Less</u> Accumulated depreciation	(780,932)	(11,293)	(3,502)	-	(795,727)
<u>Less</u> Accumulated impairment	(12,062)	(390)	-	-	(12,452)
Net book value	262,517	18,195	1,604	97,991	380,307

Separate financial statements				
Unit: Million US Dollar				
	Exploration and production assets	Others	Assets under construction	Total
As at 1 January 2020				
Cost	13,360	84	390	13,834
<u>Less</u> Accumulated depreciation	(10,468)	(61)	-	(10,529)
Net book value	2,892	23	390	3,305
For the year ended 31 December 2020				
Opening net book value	2,892	23	390	3,305
Additions	174	6	246	426
Disposals and write-off, net	(1)	-	(1)	(2)
Reclassification	135	-	(135)	-
Depreciation charged	(971)	(4)	-	(975)
Closing net book value	2,229	25	500	2,754
As at 31 December 2020				
Cost	13,514	89	500	14,103
<u>Less</u> Accumulated depreciation	(11,285)	(64)	-	(11,349)
Net book value	2,229	25	500	2,754

	Separate financial statements			
	Unit: Million US Dollar			
	Exploration and production assets	Others	Assets under construction	Total
For the year ended 31 December 2021				
Opening net book value	2,229	25	500	2,754
Additions	326	1	324	651
Disposals and write-off, net	(259)	-	-	(259)
Reclassification	175	1	(176)	-
Depreciation charged	(996)	(4)	-	(1,000)
Closing net book value	1,475	23	648	2,146
As at 31 December 2021				
Cost	13,628	87	648	14,363
<u>Less</u> Accumulated depreciation	(12,153)	(64)	-	(12,217)
Net book value	1,475	23	648	2,146

Separate financial statements				
Unit: Million Baht				
	Exploration and production assets	Others	Assets under construction	Total
As at 1 January 2020				
Cost	402,865	2,533	11,758	417,156
<u>Less</u> Accumulated depreciation	(315,673)	(1,827)	-	(317,500)
Net book value	87,192	706	11,758	99,656
For the year ended 31 December 2020				
Opening net book value	87,192	706	11,758	99,656
Additions	5,443	193	7,682	13,318
Disposals and write-off, net	(28)	(4)	(37)	(69)
Reclassification	4,195	9	(4,204)	-
Depreciation charged	(30,348)	(126)	-	(30,474)
Currency translation differences	487	(6)	(182)	299
Closing net book value	66,941	772	15,017	82,730
As at 31 December 2020				
Cost	405,914	2,683	15,017	423,614
<u>Less</u> Accumulated depreciation	(338,973)	(1,911)	-	(340,884)
Net book value	66,941	772	15,017	82,730

	Separate financial statements			
	Unit: Million Baht			
	Exploration and production assets	Others	Assets under construction	Total
For the year ended 31 December 2021				
Opening net book value	66,941	772	15,017	82,730
Additions	10,402	48	10,347	20,797
Disposals and write-off, net	(8,261)	(3)	(13)	(8,277)
Reclassification	5,575	22	(5,597)	-
Depreciation charged	(31,760)	(145)	-	(31,905)
Currency translation differences	6,392	84	1,913	8,389
Closing net book value	49,289	778	21,667	71,734
As at 31 December 2021				
Cost	455,445	2,895	21,667	480,007
<u>Less</u> Accumulated depreciation	(406,156)	(2,117)	-	(408,273)
Net book value	49,289	778	21,667	71,734

Impairment loss on property, plant and equipment is disclosed in Note 21.

As at 31 December 2021 and 2020, the Group has capital expenditure commitments as disclosed in Note 36.1.

18 Right-of-use assets

Consolidated financial statements			
Unit: Million US Dollar			
	Exploration and production assets	Others	Total
As at 1 January 2020			
Cost	-	-	-
<u>Less</u> Accumulated amortisation	-	-	-
Net book value	-	-	-
For the year ended 31 December 2020			
Opening net book value	-	-	-
Impact of the adoption of TFRS 16	467	29	496
Additions	91	6	97
Decreases	(1)	-	(1)
Agreement modification	1	-	1
Amortisation charged	(90)	(20)	(110)
Closing net book value	468	15	483
As at 31 December 2020			
Cost	558	35	593
<u>Less</u> Accumulated amortisation	(90)	(20)	(110)
Net book value	468	15	483

For the year ended 31 December 2021

Opening net book value

Additions

Decreases

Agreement modification

Amortisation charged

Closing net book value

As at 31 December 2021

Cost

Less Accumulated amortisation

Net book value

Consolidated financial statements		
Unit: Million US Dollar		
Exploration and production assets	Others	Total
468	15	483
149	33	182
(9)	-	(9)
5	-	5
(127)	(14)	(141)
486	34	520
672	44	716
(186)	(10)	(196)
486	34	520

Consolidated financial statements		
Unit: Million Baht		
Exploration and production assets	Others	Total

As at 1 January 2020

Cost	-	-	-
<u>Less</u> Accumulated amortisation	-	-	-
Net book value	-	-	-

For the year ended 31 December 2020

Opening net book value	-	-	-
Impact of the adoption of TFRS 16	14,078	866	14,944
Additions	2,840	192	3,032
Decreases	(21)	(2)	(23)
Agreement modification	43	1	44
Amortisation charged	(2,826)	(626)	(3,452)
Currency translation differences	(58)	14	(44)
Closing net book value	14,056	445	14,501

As at 31 December 2020

Cost	16,756	1,045	17,801
<u>Less</u> Accumulated amortisation	(2,700)	(600)	(3,300)
Net book value	14,056	445	14,501

For the year ended 31 December 2021

	Exploration and production assets	Others	Total
Opening net book value	14,056	445	14,501
Additions	4,763	1,051	5,814
Decreases	(280)	(7)	(287)
Agreement modification	159	2	161
Amortisation charged	(4,098)	(426)	(4,524)
Currency translation differences	1,626	78	1,704
Closing net book value	16,226	1,143	17,369

As at 31 December 2021

Cost	22,459	1,463	23,922
<u>Less</u> Accumulated amortisation	(6,233)	(320)	(6,553)
Net book value	16,226	1,143	17,369

Consolidated financial statements

Unit: Million Baht

	Separate financial statements		
	Unit: Million US Dollar		
	Exploration and production assets	Others	Total
As at 1 January 2020			
Cost	-	-	-
<u>Less</u> Accumulated amortisation	-	-	-
Net book value	-	-	-
For the year ended 31 December 2020			
Opening net book value	-	-	-
Impact of the adoption of TFRS 16	6	25	31
Additions	42	5	47
Amortisation charged	(8)	(18)	(26)
Closing net book value	40	12	52
As at 31 December 2020			
Cost	48	31	79
<u>Less</u> Accumulated amortisation	(8)	(19)	(27)
Net book value	40	12	52

For the year ended 31 December 2021

Opening net book value

Additions

Decreases

Agreement modification

Amortisation charged

Closing net book value

As at 31 December 2021

Cost

Less Accumulated amortisation

Net book value

Separate financial statements		
Unit: Million US Dollar		
Exploration and production assets	Others	Total
40	12	52
9	25	34
(2)	-	(2)
2	-	2
(19)	(11)	(30)
30	26	56
55	33	88
(25)	(7)	(32)
30	26	56

	Separate financial statements		
	Unit: Million Baht		
	Exploration and production assets	Others	Total
As at 1 January 2020			
Cost	-	-	-
<u>Less</u> Accumulated amortisation	-	-	-
Net book value	-	-	-
For the year ended 31 December 2020			
Opening net book value	-	-	-
Impact of the adoption of TFRS 16	179	768	947
Additions	1,321	169	1,490
Agreement modification	(8)	-	(8)
Amortisation charged	(246)	(577)	(823)
Currency translation differences	(45)	13	(32)
Closing net book value	1,201	373	1,574
As at 31 December 2020			
Cost	1,440	927	2,367
<u>Less</u> Accumulated amortisation	(239)	(554)	(793)
Net book value	1,201	373	1,574

For the year ended 31 December 2021

Opening net book value

Additions

Decreases

Agreement modification

Amortisation charged

Currency translation differences

Closing net book value

As at 31 December 2021

Cost

Less Accumulated amortisation

Net book value

Separate financial statements		
Unit: Million Baht		
Exploration and production assets	Others	Total
1,201	373	1,574
296	792	1,088
(67)	(1)	(68)
82	1	83
(620)	(365)	(985)
126	61	187
1,018	861	1,879
1,862	1,099	2,961
(844)	(238)	(1,082)
1,018	861	1,879

19 Goodwill

	Consolidated financial statements		Separate financial statements	
	Unit: Million US Dollar	Unit: Million Baht	Unit: Million US Dollar	Unit: Million Baht
As at 1 January 2020				
Cost	2,016	60,796	75	2,266
<u>Less</u> Provision for impairment	(112)	(3,389)	-	-
Net book value	1,904	57,407	75	2,266
For the year ended 31 December 2020				
Opening net book value	1,904	57,407	75	2,266
Currency translation differences	-	(222)	-	(8)
Closing net book value	1,904	57,185	75	2,258
As at 31 December 2020				
Cost	2,016	60,561	75	2,258
<u>Less</u> Provision for impairment	(112)	(3,376)	-	-
Net book value	1,904	57,185	75	2,258
For the year ended 31 December 2021				
Opening net book value	1,904	57,185	75	2,258
Allowance for impairment of assets	(163)	(5,471)	-	-
Currency translation differences	-	6,463	-	254
Closing net book value	1,741	58,177	75	2,512
As at 31 December 2021				
Cost	2,016	67,381	75	2,512
<u>Less</u> Provision for impairment	(275)	(9,204)	-	-
Net book value	1,741	58,177	75	2,512

Goodwill is allocated to the Group's cash-generating units (CGUs).

Goodwill allocation presented by the CGUs as follows:

Consolidated financial statements				
Unit: Million US Dollar		Unit: Million Baht		
2021	2020	2021	2020	
As at 31 December				
Exploration and production				
Thailand	521	521	17,393	15,633
Other Southeast Asia	454	454	15,176	13,640
Middle East	142	142	4,747	4,266
Africa	563	726	18,814	21,806
Others	44	44	1,465	1,317
Others	17	17	582	523
Total	1,741	1,904	58,177	57,185

Separate financial statements				
Unit: Million US Dollar		Unit: Million Baht		
2021	2020	2021	2020	
As at 31 December				
Exploration and production				
Thailand	75	75	2,512	2,258
Total	75	75	2,512	2,258

Goodwill impairment testing

The Group tested impairment of goodwill from business acquisition annually, or more frequently if events or changes in circumstances indicate that it might be impaired. The Group compares the carrying amount of the goodwill with the recoverable amount of each cash-generating units which is the higher of the fair value less cost to sell or value-in-use.

An asset or group of assets described as cash-generating unit (CGU) is the smallest identifiable group of assets that generates inflows that are largely independent from the cash flows from other CGUs. The Group considers the CGU at the individual project level assessing the expected future cash flows over the average life of the project with a growth rate along with the industry's information.

The measurements of fair value less cost to sell and value-in-use are based on a proved and probable reserve production profile including other key estimates and assumptions such as the short-term forward oil price curve, long-term oil price based on supply and demand of oil in the global market, exchange rates, discount rates, and project management team estimate of the capital expenditure and operating expenditure as well as past industry performance which were consistent with the external sources of information. The weighted average cost of capital of each project in each region is used for discount rate for financial estimation. For consolidated financial statements, the discount rate for exploration and production segment consists of Southeast Asia at rate of 6% - 7% per annum (2020: 4% - 6% per annum), Africa at rate of 8% - 9% per annum (2020: 7% - 10% per annum), Middle East at rate of 5% - 8% per annum (2020: 6% - 8% per annum) and others at rate of 5% - 6% per annum (2020: 4% - 5% per annum), and for others segment is at rate of 4% - 5% per annum (2020: 4% per annum). For separate financial statements, the discount rate for exploration and production segment consists of Southeast Asia at rate of 6% - 7% per annum (2020: 4% - 5% per annum).

If the discounted cash flow in goodwill impairment testing increases approximately 0.3% - 10% per annum, there still would be no allowance for goodwill impairment recognised in the consolidated and separate financial statements for the year ended 31 December 2021.

Impairment loss on goodwill

During the fourth quarter of 2021, the Group considered and found that some projects in development phase have changed its development plan based on current situation resulting in a significant delay of its operation. These events are the key indicators that require the Group to perform impairment assessment for its projects. The Group found that there was impairment loss on goodwill occurred.

The Group measures recoverable amount of assets using fair value less cost to sell which are based on a proved and probable reserve production profile including other key estimates and assumptions such as the long-term oil price based on supply and demand of oil in the world market, foreign currency exchange rates, growth rates, discount rates, and estimated of the capital expenditure and operating expenditure made by management of the project as well as past industry performance which were consistent with the external sources of information. The Group used the discounted cash flows based on the average life of the project greater than 5 years with discount rates around 8% - 9%.

During the year ended 31 December 2021, the Group recognised impairment loss on goodwill in the consolidated statement of income as follows:

		Consolidated financial statements	
		Unit: Million US Dollar	Unit: Million Baht
Impairment loss on goodwill		163	5,471
Total		163	5,471

		Consolidated financial statements		
		Unit: Million US Dollar		
Group of assets	Basis using to identify the recoverable amount	The carrying amount of group of assets before impairment	The carrying amount of group of assets after impairment	Impairment loss
Overseas	Fair value less cost to sell	2,770	2,607	163
			Total	163

		Consolidated financial statements		
		Unit: Million Baht		
Group of assets	Basis using to identify the recoverable amount	The carrying amount of group of assets before impairment	The carrying amount of group of assets after impairment	Impairment loss
Overseas	Fair value less cost to sell	92,564	87,093	5,471
			Total	5,471

The amount of impairment loss on goodwill is disclosed in Note 9 Segment and revenue information.

20 Exploration and evaluation assets

		Consolidated financial statements	
		Unit: Million US Dollar	Unit: Million Baht
As at 1 January 2020			
Cost		4,606	138,905
<u>Less</u> Accumulated impairment		(1,726)	(52,052)
Net book value		2,880	86,853
For the year ended 31 December 2020			
Opening net book value		2,880	86,853
Additions		104	3,235
Decreases		(35)	(1,099)
Reclassification		(17)	(527)
Allowance for impairment loss on assets		(44)	(1,360)
Currency translation differences		(2)	(408)
Closing net book value		2,886	86,694

	Consolidated financial statements	
	Unit: Million US Dollar	Unit: Million Baht
As at 31 December 2020		
Cost	4,694	140,982
<u>Less</u> Accumulated impairment	(1,808)	(54,288)
Net book value	2,886	86,694
For the year ended 31 December 2021		
Opening net book value	2,886	86,694
Business acquisition	332	10,286
Additions	134	4,280
Decreases	(187)	(5,971)
Reclassification	(44)	(1,413)
Currency translation differences	-	10,437
Closing net book value	3,121	104,313
As at 31 December 2021		
Cost	4,446	148,599
<u>Less</u> Accumulated impairment	(1,325)	(44,286)
Net book value	3,121	104,313

During the year ended 31 December 2021, the Group wrote-off some portions of the exploration and evaluation assets of the exploration project in Brazil amounting to US Dollar 144.72 million (Baht 4,454.56 million) which included in exploration expenses in the consolidated statement of income.

Impairment loss on exploration and evaluation assets is disclosed in Note 21.

21 Impairment loss on assets

Assets that are subject to amortisation are reviewed for impairment whenever events or change in circumstances indicate that the carrying amount of the assets exceeds its recoverable amount. An impairment loss is recognised when the carrying amount of the asset is higher than its recoverable amount which is the higher of the asset's fair value less cost to sell or value-in-use.

An asset or group of assets described as cash-generating unit (CGU) is the smallest identifiable group of assets that generates inflows that are largely independent from the cash flows from other CGUs. The Group considers the CGU at the individual project level assessing the expected future cash flows over the average life of the project with a growth rate along with the industry's information.

In Quarter 4 of 2021, the Group considered and found that the production plan of some production projects had been significantly reduced in accordance to the potential of petroleum reserves. These events are the key indicators that require the Group to perform impairment assessment for its projects.

The Group measures recoverable amount of assets using fair value less cost to sell and value-in-use which are based on a proved and probable reserve production profile including other key estimates and assumptions such as the short-term forward oil price curve, long-term oil price based on supply and demand of oil in the world market, foreign currency exchange rates, discount rates, and estimated of the capital expenditure and operating expenditure made by the management of the project as well as past industry performance which were consistent with the external sources of information. The Group used the discounted cash flow in the calculation by applying discount rates about 10% - 11% (2020: 4% - 5%).

During the year ended 31 December 2021, the Group recognised impairment loss on assets in the consolidated profit or loss, categorised by classification of asset as follows:

	Consolidated financial statements	
	Unit: Million US Dollar	Unit: Million Baht
Impairment loss on exploration and production assets recognised in property, plant and equipment	20	671
Total	20	671

		Consolidated financial statements		
		Unit: Million US Dollar		
Group of assets	Basis using to identify the recoverable amount	The carrying amount of group of assets before impairment	The carrying amount of group of assets after impairment	Impairment loss
Overseas	Value-in-use	25	5	20
			Total	20

		Consolidated financial statements		
		Unit: Million Baht		
Group of assets	Basis using to identify the recoverable amount	The carrying amount of group of assets before impairment	The carrying amount of group of assets after impairment	Impairment loss
Overseas	Value-in-use	822	151	671
			Total	671

The amount of impairment loss on assets is disclosed in Note 9 Segment and revenue information.

22 Deferred income taxes

Deferred tax assets and liabilities comprised:

Consolidated financial statements				
Unit: Million US Dollar		Unit: Million Baht		
31 December 2021	31 December 2020	31 December 2021	31 December 2020	
Deferred tax assets	1,318	1,099	44,042	33,001
Deferred tax liabilities	(1,504)	(1,446)	(50,272)	(43,427)
Deferred taxes, net	(186)	(347)	(6,230)	(10,426)

Separate financial statements				
Unit: Million US Dollar		Unit: Million Baht		
31 December 2021	31 December 2020	31 December 2021	31 December 2020	
Deferred tax assets	790	770	26,401	23,122
Deferred tax liabilities	-	-	-	-
Deferred taxes, net	790	770	26,401	23,122

The movements in deferred tax assets and liabilities during the year are as follows:

Consolidated financial statements					
Unit: Million US Dollar					
	As at 1 January 2021	Statement of income	Statement of comprehensive income	Business acquisition	As at 31 December 2021
Deferred tax assets					
Decommissioning costs	1,112	(12)	-	-	1,100
Provision for employee benefits	111	-	(32)	-	79
Property, plant and equipment and intangible assets	6	(1)	-	-	5
Loss carried forward	316	(79)	(2)	-	235
Financial derivatives	2	5	-	-	7
Allowance for impairment loss on assets	135	(7)	-	-	128
Lease liabilities	5	3	-	-	8
Cost recovery	36	(110)	-	326	252
Others	167	(36)	-	-	131
	1,890	(237)	(34)	326	1,945
Tax effect of currency translation on tax base	8	(8)	-	-	-
	1,898	(245)	(34)	326	1,945
Deferred tax liabilities					
Property, plant and equipment and intangible assets	2,222	(218)	-	109	2,113
Financial derivatives	6	(5)	-	-	1
Others	17	(2)	-	-	15
	2,245	(225)	-	109	2,129
Tax effect of currency translation on tax base	-	2	-	-	2
	2,245	(223)	-	109	2,131
Deferred taxes, net	(347)	(22)	(34)	217	(186)

Consolidated financial statements				
Unit: Million US Dollar				
	As at 1 January 2020	Statement of income	Statement of comprehensive income	As at 31 December 2020
Deferred tax assets				
Decommissioning costs	1,016	96	-	1,112
Provision for employee benefits	103	8	-	111
Property, plant and equipment and intangible assets	8	(2)	-	6
Loss carried forward	298	16	2	316
Financial derivatives	1	1	-	2
Allowance for impairment loss on assets	125	10	-	135
Lease liabilities	-	5	-	5
Cost recovery	33	3		36
Others	169	(2)	-	167
	1,753	135	2	1,890
Tax effect of currency translation on tax base	104	(96)	-	8
	1,857	39	2	1,898
Deferred tax liabilities				
Property, plant and equipment and intangible assets	2,308	(86)	-	2,222
Financial derivatives	15	(1)	(8)	6
Others	14	3	-	17
	2,337	(84)	(8)	2,245
Tax effect of currency translation on tax base	1	(1)	-	-
	2,338	(85)	(8)	2,245
Deferred taxes, net	(481)	124	10	(347)

	Consolidated financial statements					
	Unit: Million Baht					
	As at		Statement of		Currency	As at
	1 January	Statement	comprehensive	Business	translation	31 December
	2021	of income	income	acquisition	differences	2021
Deferred tax assets						
Decommissioning costs	33,400	(260)	-	21	3,615	36,776
Provision for employee benefits	3,335	(13)	(1,083)	-	363	2,602
Property, plant and equipment						
and intangible assets	172	(24)	-	-	19	167
Loss carried forward	9,477	(2,535)	(51)	-	963	7,854
Financial derivatives	53	172	(4)	-	17	238
Allowance for impairment loss						
on assets	4,060	(149)	-	-	375	4,286
Lease liabilities	147	102	-	-	19	268
Cost recovery	1,090	(3,581)	-	10,094	824	8,427
Others	5,013	(1,154)	-	-	493	4,352
	56,747	(7,442)	(1,138)	10,115	6,688	64,970
Tax effect of currency translation						
on tax base	246	(248)	-	-	2	-
	56,993	(7,690)	(1,138)	10,115	6,690	64,970
Deferred tax liabilities						
Property, plant and equipment						
and intangible assets	66,748	(6,644)	-	3,378	7,512	70,634
Financial derivatives	154	(148)	-	-	6	12
Others	571	(71)	-	-	57	503
	67,419	(6,863)	-	3,378	7,215	71,149
Tax effect of currency translation						
on tax base	-	46	-	-	5	51
	67,419	(6,817)	-	3,378	7,220	71,200
Deferred taxes, net	(10,426)	(873)	(1,138)	6,737	(530)	(6,230)

Consolidated financial statements					
Unit: Million Baht					
	As at 1 January 2020	Statement of income	Statement of comprehensive income	Currency translation differences	As at 31 December 2020
Deferred tax assets					
Decommissioning costs	30,643	2,986	-	(229)	33,400
Provision for employee benefits	3,116	243	-	(24)	3,335
Property, plant and equipment and intangible assets	234	(58)	-	(4)	172
Loss carried forward	8,979	374	67	57	9,477
Financial derivatives	16	38	-	(1)	53
Allowance for impairment loss on assets	3,782	271	-	7	4,060
Lease liabilities	-	159	-	(12)	147
Cost recovery	982	115	-	(7)	1,090
Others	5,081	(127)	-	59	5,013
	52,833	4,001	67	(154)	56,747
Tax effect of currency translation on tax base	3,124	(2,950)	-	72	246
	55,957	1,051	67	(82)	56,993
Deferred tax liabilities					
Property, plant and equipment and intangible assets	69,586	(2,876)	-	38	66,748
Financial derivatives	433	(48)	(247)	16	154
Others	399	97	(1)	22	517
	70,418	(2,827)	(248)	76	67,419
Tax effect of currency translation on tax base	36	(37)	-	1	-
	70,454	(2,864)	(248)	77	67,419
Deferred taxes, net	(14,497)	3,915	315	(159)	(10,426)

Separate financial statements				
Unit: Million US Dollar				
	As at 1 January 2021	Statement of income	Statement of comprehensive income	As at 31 December 2021
Deferred tax assets				
Decommissioning costs	732	(52)	-	680
Provision for employee benefits	105	(1)	(33)	71
Loss carried forward	211	(78)	(2)	131
Others	62	(23)	1	40
	1,110	(154)	(34)	922
Deferred tax liabilities				
Property, plant and equipment and intangible assets	338	(206)	-	132
Lease liabilities	-	-	-	-
Others	2	(2)	-	-
	340	(208)	-	132
Deferred taxes, net	770	54	(34)	790

	Separate financial statements			
	Unit: Million US Dollar			
	As at 1 January 2020	Statement of income	Statement of comprehensive income	As at 31 December 2020
Deferred tax assets				
Decommissioning costs	682	50	-	732
Provision for employee benefits	99	6	-	105
Loss carried forward	269	(60)	2	211
Others	83	(21)	-	62
	1,133	(25)	2	1,110
Tax effect of currency translation on tax base	42	(42)	-	-
	1,175	(67)	2	1,110
Deferred tax liabilities				
Property, plant and equipment and intangible assets	525	(187)	-	338
Others	10	(2)	(6)	2
	535	(189)	(6)	340
Deferred taxes, net	640	122	8	770

	Separate financial statements				
	Unit: Million Baht				
	As at 1 January 2021	Statement of income	Statement of comprehensive income	Currency translation differences	As at 31 December 2021
Deferred tax assets					
Decommissioning costs	21,992	(1,601)	-	2,330	22,721
Provision for employee benefits	3,139	(22)	(1,083)	341	2,375
Loss carried forward	6,331	(2,390)	(46)	492	4,387
Others	1,872	(701)	20	148	1,339
	33,334	(4,714)	(1,109)	3,311	30,822
Deferred tax liabilities					
Property, plant and equipment and intangible assets	10,140	(6,311)	-	569	4,398
Lease liabilities	4	14	-	2	20
Others	68	(66)	-	1	3
	10,212	(6,363)	-	572	4,421
Deferred taxes, net	23,122	1,649	(1,109)	2,739	26,401

Separate financial statements					
Unit: Million Baht					
	As at 1 January 2020	Statement of income	Statement of comprehensive income	Currency translation differences	As at 31 December 2020
Deferred tax assets					
Decommissioning costs	20,563	1,588	-	(159)	21,992
Provision for employee benefits	2,980	179	-	(20)	3,139
Loss carried forward	8,101	(1,895)	63	62	6,331
Others	2,510	(661)	-	23	1,872
	34,154	(789)	63	(94)	33,334
Tax effect of currency translation on tax base	1,278	(1,315)	-	37	-
	35,432	(2,104)	63	(57)	33,334
Deferred tax liabilities					
Property, plant and equipment and intangible assets	15,820	(5,914)	-	234	10,140
Lease liabilities	-	4	-	-	4
Others	319	(61)	(204)	14	68
	16,139	(5,971)	(204)	248	10,212
Deferred taxes, net	19,293	3,867	267	(305)	23,122

Deferred income tax assets are recognised for tax loss and carried forwards only to the extent that realisation of the related tax benefit through the future taxable profits is probable. The Group does not recognise deferred tax asset from tax losses of US Dollar 1,025 million (2020: US Dollar 2,929 million) to carry forward against future taxable income. Some portions of tax losses could be carried forward against future taxable income without expiration invalid and some portions will be expired during 2022 to 2041.

23 Other non-current assets

Consolidated financial statements				
Unit: Million US Dollar			Unit: Million Baht	
31 December	31 December	31 December	31 December	
2021	2020	2021	2020	
Land usage fee	20	21	664	642
Advance payment and accrued interest	49	53	1,640	1,599
Pension scheme investments from joint operation	61	55	2,048	1,648
Prepaid expenses	10	11	341	322
Deferred remuneration under agreement	8	10	260	287
Others	32	30	1,052	911
	180	180	6,005	5,409

Separate financial statements				
Unit: Million US Dollar			Unit: Million Baht	
31 December	31 December	31 December	31 December	
2021	2020	2021	2020	
Deposits	4	5	145	145
Land usage fee	5	5	166	160
Prepaid expenses	1	-	22	5
Deferred remuneration under agreement	8	10	260	287
Others	4	1	157	26
	22	21	750	623

24 Trade and other payable

Consolidated financial statements				
Unit: Million US Dollar			Unit: Million Baht	
31 December	31 December	31 December	31 December	
2021	2020	2021	2020	
Trade payable	148	121	4,952	3,636
Working capital to co-ventures	21	22	691	654
Account payable - related parties	16	10	529	312
Accrued expenses	897	727	29,990	21,828
Accrued interest expense	15	14	498	414
	1,097	894	36,660	26,844

Separate financial statements				
Unit: Million US Dollar			Unit: Million Baht	
31 December	31 December	31 December	31 December	
2021	2020	2021	2020	
Trade payable	26	26	865	780
Account payable - related parties	9	6	310	195
Accrued expenses	320	266	10,708	7,991
Accrued interest expense	4	3	127	80
	359	301	12,010	9,046

25 Loans, debentures and lease liabilities

Loans, debentures and lease liabilities comprised:

Consolidated financial statements				
Unit: Million US Dollar			Unit: Million Baht	
31 December 2021	31 December 2020	31 December 2021	31 December 2020	
Current portion				
Current portion of debentures	449	-	14,997	-
Current portion of lease liabilities	184	135	6,169	4,069
	633	135	21,166	4,069
Non-current portion				
Debentures	2,476	2,830	82,741	85,016
Long-term loans	596	595	19,920	17,862
Lease liabilities	388	372	12,984	11,161
	3,460	3,797	115,645	114,039
Total loans, debentures and lease liabilities	4,093	3,932	136,811	118,108

Separate financial statements				
Unit: Million US Dollar			Unit: Million Baht	
31 December 2021	31 December 2020	31 December 2021	31 December 2020	
Current portion				
Current portion of lease liabilities	31	26	1,029	769
	31	26	1,029	769
Non-current portion				
Debentures	520	379	17,384	11,392
Lease liabilities	29	31	982	938
	549	410	18,366	12,330
Total debentures and lease liabilities	580	436	19,395	13,099

a) Debentures

The carrying value of unsecured and unsubordinated debentures comprised:

	Consolidated financial statements					
	Unit: Million US Dollar			Unit: Million Baht		
	Interest rates (% per annum)	Effective interest rates (% per annum)	Maturity date	31 December 2021	31 December 2020	31 December 2020
Maturity date within 1 year						
- Debentures Baht 15,000 million	2.26	2.312	19 June 2022	449	499	14,991
Maturity date over 3 years but not exceeding 5 years						
- Debentures Baht 6,000 million	2.00 - 2.75	2.214	5 November 2026	179	-	-
Maturity date over 5 years						
- Debentures Baht 11,400 million	4.82	4.89	6 June 2029	341	379	11,392
- Debentures US Dollar 500 million	2.587	2.637	10 June 2027	499	498	14,968
- Debentures US Dollar 350 million	2.993	3.063	15 January 2030	322	319	9,575
- Debentures US Dollar 490 million	6.35	6.507	12 June 2042	487	487	14,642
- Debentures US Dollar 650 million	3.903	3.958	6 December 2059	648	648	19,448
Total carrying value				2,925	2,830	85,016

		Separate financial statements			
		Unit: Million US Dollar		Unit: Million Baht	
		31 December 2021	31 December 2020	31 December 2021	31 December 2020
Interest rates (% per annum)	Effective interest rates (% per annum)	Maturity date			
Maturity date over 3 years					
but not exceeding 5 years					
- Debentures Baht 6,000 million	2.00 - 2.75	2.214	5 November 2026	179	-
Maturity date over 5 years					
- Debentures Baht 11,400 million	4.82	4.89	6 June 2029	341	11,392
Total carrying value				520	11,392

The fair values of debentures as at 31 December 2021 and 2020 are disclosed in Note 10.2.3.

The movements of debentures for the year ended 31 December are as follows:

	Consolidated financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
Opening net book value	2,830	2,705	85,016	81,559
Cash flows:				
Increase	180	850	5,745	26,584
Repayment of debentures	-	(700)	-	(21,893)
Deferred finance cost	-	(31)	(5)	(972)
Non-cash movement:				
Amortisation of deferred finance cost	4	3	118	103
Foreign exchange differences	(89)	3	(2,851)	106
Currency translation differences	-	-	9,715	(471)
Closing net book value	2,925	2,830	97,738	85,016

	Separate financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
Opening net book value	379	378	11,392	11,391
Cash flows:				
Increase	180	-	5,745	-
Non-cash movement:				
Amortisation of deferred finance cost	-	-	(8)	1
Foreign exchange differences	(39)	1	(1,239)	46
Currency translation differences	-	-	1,494	(46)
Closing net book value	520	379	17,384	11,392

Repurchase and issuance of debentures

The details of movements of debentures during the year ended 31 December 2021 are as follows:

On 5 November 2021, the Company had issued name-registered, unsubordinated, and unsecured digital debenture with a bondholders' representative in the amount of Baht 6,000 million (US Dollar 179.96 million). The debenture had a tenor of 5-years, bears a step-up interest rate with the minimum of 2.00% per annum and the maximum of 2.75% per annum, averaging to 2.25% per annum. The Company entered into a cross currency swap transaction with a financial institution to swap Baht debenture for US Dollar 181.82 million at the average exchange rate of Baht 33 per US Dollar with an average interest rate of 2.53% per annum.

b) Long-term loans

Long-term loans from financial institutions comprised:

	Interest rates (% per annum)	Effective interest rates (% per annum)	Maturity date	Consolidated financial statements			
				Unit: Million US Dollar		Unit: Million Baht	
				31 December 2021	31 December 2020	31 December 2021	31 December 2020
Maturity date over 1 years but not exceeding 3 years							
- Loans US Dollar 480 million	6M LIBOR + 0.85	1.67	20 October 2024	477	476	15,927	14,279
- Loans US Dollar 120 million	6M LIBOR + 0.95	1.667	20 October 2024	119	119	3,993	3,583
Total carrying value				596	595	19,920	17,862

The fair values of long-term loans are close to their carrying amounts, as disclosed in Note 10.2.3.

The movements of long-term loans for the year ended 31 December are as follows:

	Consolidated financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
Opening net book value	595	593	17,862	17,889
Cash flows:				
Increase	-	-	-	-
Non-cash movement:				
Amortisation of deferred finance cost	1	2	45	44
Currency translation differences	-	-	2,013	(71)
Closing net book value	596	595	19,920	17,862

c) **Lease liabilities**

The movements of lease liabilities for the year ended 31 December are as follows:

	Consolidated financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
Opening net book value	507	144	15,230	4,333
Cash flows:				
Repayment of lease liabilities	(145)	(115)	(4,621)	(3,612)
Non-cash movements:				
Impact of adoption of TFRS 16	-	362	-	10,909
Deferred finance cost	16	19	520	593
Additions of lease liabilities	194	97	6,186	3,048
Decreases of lease liabilities	(3)	(1)	(85)	(24)
Agreement modification	5	1	161	44
Foreign exchange differences	(2)	-	(52)	(1)
Currency translation differences	-	-	1,814	(60)
Closing net book value	572	507	19,153	15,230

	Separate financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
Opening net book value	57	1	1,707	32
Cash flows:				
Repayment of lease liabilities	(31)	(23)	(999)	(739)
Non-cash movements:				
Impact of adoption of TFRS 16	-	30	-	905
Deferred finance cost	1	1	45	40
Additions of lease liabilities	34	48	1,088	1,509
Decreases of lease liabilities	(3)	-	(82)	-
Agreement modification	3	-	82	(8)
Foreign exchange differences	(1)	-	(27)	3
Currency translation differences	-	-	197	(35)
Closing net book value	60	57	2,011	1,707

Related leases transaction recognised in the statement of income for the year ended 31 December are as follows:

	Consolidated financial statements			
	Unit: Million US Dollar		Unit: Million US Baht	
	2021	2020	2021	2020
Expenses related to short-term lease	9	11	288	357
Expenses related to low-value assets lease	5	4	148	121
Expenses related to variable lease payment, which does not include in lease liabilities	-	-	3	4

	Separate financial statements			
	Unit: Million US Dollar		Unit: Million US Baht	
	2021	2020	2021	2020
Expenses related to short-term lease	2	3	60	87
Expenses related to low-value assets lease	4	3	137	79
Expenses related to variable lease payment, which does not include in lease liabilities	-	-	2	2

26 Provision for decommissioning costs

Provision for decommissioning costs are as follows:

	Consolidated financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	31 December 2021	31 December 2020	31 December 2021	31 December 2020
Provision for decommissioning costs	2,724	3,203	91,044	96,209
<u>Less</u> Current portion	(265)	(63)	(8,878)	(1,881)
Non-current portion of provision for decommissioning costs	2,459	3,140	82,166	94,328

	Separate financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	31 December 2021	31 December 2020	31 December 2021	31 December 2020
Provision for decommissioning costs	1,310	1,713	43,795	51,468
<u>Less</u> Current portion	(234)	(49)	(7,831)	(1,492)
Non-current portion of provision for decommissioning costs	1,076	1,664	35,964	49,976

The movements of provision for decommissioning costs during the year are as follows:

	Consolidated financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
Balance as at 1 January	3,203	3,010	96,209	90,772
Business acquisition	4	-	138	-
Additional provision	49	191	1,564	5,990
Provision used during the year	(36)	(24)	(1,152)	(754)
Finance costs	64	95	2,042	2,973
Reversal of provision	(556)	(69)	(17,762)	(2,169)
Foreign exchange differences	(4)	-	(117)	-
Currency translation differences	-	-	10,122	(603)
Balance as at 31 December	2,724	3,203	91,044	96,209

	Separate financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
Balance as at 1 January	1,713	1,584	51,468	47,774
Additional provision	12	92	393	2,882
Provision used during the year	(29)	(11)	(929)	(343)
Finance costs	31	49	989	1,529
Reversal of provision	(413)	(1)	(13,200)	(28)
Foreign exchange differences	(4)	-	(120)	-
Currency translation differences	-	-	5,194	(346)
Balance as at 31 December	1,310	1,713	43,795	51,468

On 9 November 2021, the Company entered into Asset Transferred Agreement with Department of Mineral Fuels, Ministry of Energy to determine the assets that the concessionaire of Bongkot project shall transfer to the government at the end of the concession including decommissioning costs of transferred assets which the Company shall pay to the government in accordance to the Company's participating interest. The Company recognised provision for decommissioning costs of those transferred assets to be in line with provision for decommissioning cost of the cash subject to pay to the government and adjusted to the carrying amount of the transferred assets and relevant depreciation, depletion and amortisation.

The Group records a provision for decommissioning costs whenever it is probable that there would be an obligation as a result of a past event and the amount of that obligation is reliably estimated by the Group's engineers and management's judgment. The Group recognises provision for decommissioning costs as part of oil and gas properties, using the discounted present value before tax based on the estimated eventual costs that relate to the removal of the production facilities and amortised based on the unit of production of the proved reserve or the proved developed reserve. The Group recognises an increase that reflects the passage of time from the unwinding discount in each period, as a finance cost in the statements of income.

The provisions are based on the current situation such as regulations, technologies and prices. The actual results could differ from these estimates as future confirming events occur.

27 Provision for remuneration for the renewal of petroleum production

Provision for remuneration for the renewal of petroleum production are as follows:

	Consolidated financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	31 December 2021	31 December 2020	31 December 2021	31 December 2020
Provision for remuneration for the renewal of petroleum production	236	191	7,894	5,732
<u>Less</u> Current portion	(115)	(88)	(3,859)	(2,631)
Non-current portion of provision for remuneration for the renewal of petroleum production	121	103	4,035	3,101

	Separate financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	31 December 2021	31 December 2020	31 December 2021	31 December 2020
Provision for remuneration for the renewal of petroleum production	145	173	4,856	5,206
<u>Less</u> Current portion	(105)	(85)	(3,529)	(2,576)
Non-current portion of provision for remuneration for the renewal of petroleum production	40	88	1,327	2,630

Movements of provision for remuneration for the renewal of petroleum production during the year are as follows:

	Consolidated financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
Balance as at 1 January	191	269	5,732	8,100
Additional provision during the year	157	1	5,018	36
Remuneration paid during the year	(117)	(90)	(3,736)	(2,818)
Finance costs	5	17	168	521
Reversal of provision	-	(6)	-	(180)
Currency translation differences	-	-	712	73
Balance as at 31 December	236	191	7,894	5,732

	Separate financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
As at 1 January 2020	173	250	5,206	7,548
Additional provision during the year	75	1	2,403	16
Remuneration paid during the year	(106)	(88)	(3,396)	(2,751)
Finance costs	3	14	99	449
Reversal of provision	-	(4)	-	(129)
Currency translation differences	-	-	544	73
Balance as at 31 December	145	173	4,856	5,206

The Group has entered into the Supplemental Petroleum Concession Agreement with the Ministry of Energy to extend the petroleum production period for another 10 years. As a result of this extension, the Group has to pay remuneration fee to the Ministry of Energy. The management has estimated the provision for remuneration using the discounted cash flows based on the duration of the new agreement and significant assumptions, such as sales volume data and oil price, etc.

28 Provision for employee benefits

Provision for employee benefits are as follows:

	Consolidated financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
Statements of financial position				
Retirement benefits	194	252	6,495	7,571
Other long-term benefits	11	14	369	404
Liabilities in the statements of financial position	205	266	6,864	7,975
Statement of income				
Retirement benefits	37	22	1,184	689
Other long-term benefits	1	1	43	41
	38	23	1,227	730

	Separate financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
Statements of financial position				
Retirement benefits	111	175	3,692	5,254
Other long-term benefits	11	13	369	403
Liabilities in the statements of financial position	122	188	4,061	5,657
Statement of income				
Retirement benefits	27	14	872	431
Other long-term benefits	1	1	43	41
	28	15	915	472

The movements of provision for retirement benefits during the year are as follows:

	Consolidated financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
As at 1 January	252	233	7,571	7,023
Current service cost	16	15	509	479
Past service cost	14	-	440	-
Interest expense	7	7	235	210
	289	255	8,755	7,712
Gain from actuarial assumptions	(72)	(1)	(2,361)	(45)
Benefits paid	(10)	(8)	(314)	(240)
Foreign exchange differences	(13)	6	(421)	195
Currency translation differences	-	-	836	(51)
	(95)	(3)	(2,260)	(141)
As at 31 December	194	252	6,495	7,571

	Separate financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
As at 1 January	175	167	5,253	5,037
Current service cost	10	11	336	336
Past service cost	13	-	434	-
Interest expense	3	3	102	95
	201	181	6,125	5,468
Gain from actuarial assumptions	(65)	-	(2,167)	-
Benefits paid	(8)	(7)	(248)	(217)
Foreign exchange differences	(18)	1	(589)	31
Currency translation differences	-	-	571	(29)
	(91)	(6)	(2,433)	(215)
As at 31 December	110	175	3,692	5,253

Expenses recognised in the statements of income for the years are as follows:

Consolidated financial statements				
Unit: Million US Dollar		Unit: Million Baht		
2021	2020	2021	2020	
Current service cost	16	15	509	479
Past service cost	14	-	440	-
Interest expense	7	7	235	210
Total	37	22	1,184	689
Other long-term benefits	1	1	43	41
Expenses recognised in statement of income	38	23	1,227	730

Separate financial statements				
Unit: Million US Dollar		Unit: Million Baht		
2021	2020	2021	2020	
Current service cost	11	11	336	336
Past service cost	13	-	434	-
Interest expense	3	3	102	95
Total	27	14	872	431
Other long-term benefits	1	1	43	41
Expenses recognised in statement of income	28	15	915	472

(Gain) loss from actuarial assumptions recognised in the statements of comprehensive income are as follows:

	Consolidated financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
Change in financial assumptions	(59)	-	(1,951)	-
Change in demographic assumptions	3	-	105	-
Experience adjustment	(16)	(1)	(515)	(45)
Total	(72)	(1)	(2,361)	(45)

	Separate financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
Change in financial assumptions	(51)	-	(1,706)	-
Change in demographic assumptions	-	-	3	-
Experience adjustment	(14)	-	(464)	-
Total	(65)	-	(2,167)	-

The significant actuarial assumptions used were as follows:

	% per annum	
	2021	2020
Discount rate	0.52 - 6.70	1.9 - 7.15
Inflation rate	2.0	2.0 - 2.5
Turnover rate	0.0 - 15.0	0.0 - 14.0

Sensitivity analysis for each significant assumption used is as follows:

	Increase (Decrease) in impact on defined retirement benefit obligation			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
Discount rate				
Increase 1%	(15)	(23)	(506)	(677)
Decrease 1%	19	27	630	819

The above sensitivity analysis is based on a change in an assumption while holding all other assumptions constant. In practice, this is unlikely to occur, and changes in some of the assumptions may be correlated. When calculating the sensitivity of the defined benefit obligation to significant actuarial assumptions, the same method has been applied as when calculating the retirement benefits recognised in the statement of financial position.

The methods and types of assumptions used in preparing the sensitivity analysis did not change compared to the previous year.

As at 31 December 2021, the weighted average duration of the defined retirement benefit obligation is 23.6 years (2020: 20 years).

Maturity analysis of undiscounted retirement benefits are as follows:

	Consolidated financial statements		Separate financial statements	
	Unit: Million US Dollar	Unit: Million Baht	Unit: Million US Dollar	Unit: Million Baht
As at 31 December 2021				
Not later than 1 year	10	337	3	103
Over 1 to 5 years	44	1,459	37	1,232
Over 5 to 10 years	47	1,581	37	1,252
Over than 10 years	359	11,990	316	10,547
	460	15,367	393	13,134

29 Share capital

The total number of authorised ordinary shares is 3,969.98 million shares (2020: 3,969.98 million shares) with a par value of Baht 1 each (2020: a par value of Baht 1 each). All authorised ordinary shares are fully paid.

30 Legal reserve

Under the Public Companies Act., B.E. 2535, the Company is required to set aside as a legal reserve at least 5% of its net profit for the year until the reserve is not less than 10% of the authorised ordinary shares capital. The legal reserve is not available for dividend distribution. The Company has already set aside full legal reserve at 10% of the authorised ordinary shares capital.

31 Dividends

On 8 April 2021, the Annual General Meeting of the Shareholders approved payment of a dividend for the year 2020 at the rate of Baht 4.25 per share. The Company made an interim dividend payment for the first half-year operations of 2020 at the rate of Baht 1.50 per share on 28 August 2020, and for the second half-year operations of 2020 at the rate of Baht 2.75 per share on 26 April 2021.

On 27 January 2022, the Company's Board of Directors endorsed the proposal of dividend payment for the year 2021 at the rate of Baht 5.00 per share. The Company had made an interim dividend payment for the first half-year operations of 2021 at the rate of Baht 2.00 per share on 27 August 2021. The remaining is for the second half-year operations of 2021 at the rate of Baht 3.00 per share which will be paid after receiving approval from the Annual General Meeting of the Shareholders.

32 Expense by nature

Significant expenses by nature of the Group which comprise the expenses based on its participating interest in each project for the years are as follows:

	Consolidated financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
Salary, wages and employees' benefits	287	270	9,116	8,459
Repair and maintenance	188	159	6,002	4,983
Exploration well and projects write-off	215	62	6,764	1,943
Geological and geophysical expenses	7	46	226	1,439
Logistics	149	120	4,757	3,762

	Separate financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
Salary, wages and employees' benefits	273	246	8,713	7,683
Repair and maintenance	69	67	2,214	2,082
Exploration well and projects write-off	-	1	-	37
Geological and geophysical expenses	-	-	1	2
Logistics	62	51	1,975	1,610

33 Income tax expense

Income tax rates for the year ended 31 December 2021 are as follows:

	Tax Rate (%)
Income tax in Thailand	
- Corporate income tax under Revenue Code	3, 20
- Petroleum income tax on petroleum businesses in Thailand pursuant to Petroleum Income Tax Act, B.E. 2514 and 2532	50
- Petroleum income tax on petroleum business in Thailand pursuant to Petroleum Income Tax Act, B.E. 2560	20
Income tax from the Petroleum business in the Malaysia - Thailand Joint Development Area under the Petroleum Income Tax Act (No.5), B.E. 2541 and Petroleum Income tax in Malaysia	
- From the first to the eighth accounting period	Exempt
- From the ninth to the fifteenth accounting period	10
- From the sixteenth accounting period onwards	20
Income tax in Malaysia	
- Corporate income tax	24
- Petroleum income tax	25, 38
Corporate income tax in the Republic of the Union of Myanmar	22
Corporate income tax in the Socialist Republic of Vietnam	20, 50
Corporate income tax in Indonesia	
- Corporate income tax	30
- Income tax from the profit distribution	20
Corporate income tax in the Republic of Singapore	17
Corporate income tax in Hong Kong Special Administrative Region of the People's Republic of China	16.5
Corporate income tax in the Republic of Portugal	21
Corporate income tax in United Kingdom	19
Corporate income tax in the Netherlands	15, 25
Corporate income tax the Republic of Cyprus	12.5

	Tax Rate (%)
Corporate income tax in Commonwealth of Australia	
- Corporate income tax	30
- Petroleum resource rent tax in Australia	40
Corporate income tax in the Federative Republic of Brazil	24, 34
Corporate income tax in Canada	23
Corporate income tax in Mexico	30
Corporate income tax the Republic of Panama	25
Corporate income tax in People's Democratic Republic of Algeria	
- Corporate income tax	38
- Petroleum income tax	20-70
Income tax in Sultanate of Oman	
- Corporate income tax	15
- Petroleum income tax	55, 80
Corporate income tax in United Arab Emirates	50, 55
Corporate income tax in the Republic of Kazakhstan	
- Corporate income tax	30
- Income tax from the profit distribution	15
Corporate income tax in the Republic of Mozambique	32
Petroleum income tax in the Republic of Angola	50

Income tax expenses for the year ended 31 December comprised:

	Consolidated financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
Current income tax	1,265	726	40,655	22,679
Deferred income tax	22	(123)	873	(3,915)
Total income tax expenses	1,287	603	41,528	18,764

	Separate financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
Current income tax	599	457	19,183	14,276
Deferred income tax	(54)	(122)	(1,649)	(3,866)
Total income tax expenses	545	335	17,534	10,410

The income tax on the Group's profit before income tax differs from the theoretical amount that would arise using the basic tax rate of the home country of the Company are as follows:

	Consolidated financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
Profit before income tax	2,497	1,322	80,392	41,428
Tax calculated at a tax rate of 50%	1,249	661	40,196	20,714
Tax effect of:				
(Gain) loss of the entities not subject to tax	246	(22)	7,920	(684)
Expenses not deductible for tax purpose	185	311	5,952	9,757
Adjustment in respect of prior year	(15)	5	(474)	165
Results of operations of associates and joint ventures, net of tax	(8)	(21)	(244)	(654)
Tax credit on petroleum royalty	(485)	(392)	(15,606)	(12,273)
Deferred tax on functional currency	10	95	294	2,913
Difference in tax rate of the Group's operating countries	105	(32)	3,387	(1,016)
Others	-	(2)	103	(158)
Tax charge	1,287	603	41,528	18,764

	Separate financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	2021	2020	2021	2020
Profit before income tax	1,821	1,069	58,500	33,410
Tax calculated at a tax rate of 50%	911	535	29,250	16,705
Tax effect of:				
Gain from the entities not subject to tax	(15)	(6)	(461)	(181)
Expenses not deductible for tax purpose	173	153	5,573	4,782
Adjustment in respect of prior year	(1)	13	(23)	394
Tax credit on petroleum royalty	(390)	(325)	(12,501)	(10,140)
Deferred tax on functional currency	-	42	-	1,316
Difference in tax rate of the Group's operating countries	(133)	(78)	(4,282)	(2,429)
Others	-	1	(22)	(37)
Tax charge	545	335	17,534	10,410

34 Business acquisition

On 1 February 2021, PTTEP MENA Limited (PTTEP MENA), a subsidiary of the Group, signed a Sale and Purchase Agreement (SPA) to acquire the 20% interests in Block 61 Sultanate of Oman (Oman Block 61) from BP Exploration (Epsilon) Limited (BP). The acquisition was completed on 23 March 2021. This investment is an investment in a joint operation.

The process of determining fair value of the net identifiable assets acquired and reviewing purchase price allocation (PPA) of Oman Block 61 had been finalised in the fourth quarter of 2021. The gain from a bargain purchase derived from an improvement in oil price and operating plan of the project when compared to the agreed consideration date in SPA.

Details of net identifiable assets acquired on acquisition date and gain from a bargain purchase are as follows:

	Consolidated financial statements	
	Unit: Million US Dollar	Unit: Million Baht
Trade and other receivables	2	48
Inventories	18	558
Other current assets	7	228
Property, plant and equipment	2,166	69,381
Exploration and evaluation assets	332	10,286
Deferred tax assets	217	6,737
Trade and other payables	(28)	(864)
Provision for decommissioning costs	(4)	(138)
Net identifiable assets acquired	2,710	86,236
Gain from a bargain purchase	(342)	(10,694)
Total consideration	2,368	75,542

The fair value of total considerations transferred on the acquisition date of US Dollar 2,368.38 million (Baht 75,541.76 million) consists of cash payment netting with the adjustments according to the conditions as specified in the SPA of US Dollar 2,299.49 million (Baht 73,409.45 million) and the fair value of contingent consideration of US Dollar 68.89 million (Baht 2,132.31 million). The fair value of contingent consideration has been measured by using discounted cash flows method based on discount rate and relevant assumptions relating to possibilities classified as level 3 fair value.

35 Earnings per share

Basic earnings per share for the year ended 31 December are calculated as follows:

	Consolidated financial statements			
	Unit: US Dollar		Unit: Baht	
	2021	2020	2021	2020
Profit attributable to equity holders of parent (unit: million)	1,211	720	38,864	22,664
<u>Less</u> Interest expenses for subordinated capital debentures (unit: million)	(9)	(10)	(294)	(315)
Redemption of subordinated capital debentures (unit: million)	-	-	-	-
Income tax for subordinated capital debentures (unit: million)	(2)	2	(52)	78
Profit used to determine basic earnings per share (unit: million)	1,200	712	38,518	22,427
Weighted average number of ordinary shares outstanding during the year (million shares)	3,970	3,970	3,970	3,970
Basic earnings per share	0.30	0.18	9.70	5.65

	Separate financial statements			
	Unit: US Dollar		Unit: Baht	
	2021	2020	2021	2020
Profit attributable to equity holders of parent (unit: million)	1,276	734	40,966	23,000
<u>Less</u> Interest expenses for subordinated capital debentures (unit: million)	(9)	(9)	(294)	(294)
Redemption of subordinated capital debentures (unit: million)	-	-	-	-
Income tax for subordinated capital debentures (unit: million)	(2)	2	(46)	63
Profit used to determine basic earnings per share (unit: million)	1,265	727	40,626	22,769
Weighted average number of ordinary shares outstanding during the year (million shares)	3,970	3,970	3,970	3,970
Basic earnings per share	0.32	0.18	10.23	5.74

36 Commitments and contingent liabilities

36.1 Contractual commitments

As at 31 December 2021 and 2020, significant contractual commitments contracted but not recognised as liabilities are as follows:

	Consolidated financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	31 December 2021	31 December 2020	31 December 2021	31 December 2020
Capital commitments	1,637	1,035	54,708	31,099
Other commitments	72	54	2,406	1,622
Total	1,709	1,089	57,114	32,721

	Separate financial statements			
	Unit: Million US Dollar		Unit: Million Baht	
	31 December 2021	31 December 2020	31 December 2021	31 December 2020
Capital commitments	310	233	10,360	6,992
Other commitments	22	29	735	874
Total	332	262	11,095	7,866

36.2 Contingent liabilities

- On 9 August 2016, PTTEP Australasia (Ashmore Cartier) Pty Ltd (PTTEP AAA) was notified of a claim made in the Sydney Registry of the Federal Court of Australia seeking damages on behalf of a group of West Timorese seaweed farmers (Class action) for compensation relating to the Montara oil spill incident in the Timor Sea in 2009. Subsequently, on 19 March 2021, the court found that oil from the Montara oil spill incident, on the balance of probabilities, reached the lead plaintiff's seaweed farm in late 2009, destroying his 2009 seaweed crops and making it difficult for him to re-establish his crops in the following five years. The court determined the damages caused only to the lead plaintiff of the class action of approximately Indonesian Rupiah 253 million or equivalent to US Dollar 0.02 million (Baht 0.59 million). Interest payable on these damages was agreed to be approximately Indonesian Rupiah 165 million or equivalent to US Dollar 0.01 million (Baht 0.39 million) up until 31 December 2021.

On 25 October 2021, the court delivered its judgement on the remaining unanswered common questions in the class action. The court specified that impacted areas, on the balance of probabilities, from the Montara oil spill incident, from the period September to at least November 2009. The judgement relates to the lead plaintiff's claim and the common questions raised at trial only. Claims of all the class members are presently statute barred and must be determined separately. The court's decision does not negate the requirement for individual class members to demonstrate their actual loss and damage.

At the time of this report, PTTEP AAA has not been provided with information on the number of class members, the amount of their individual claims nor on the evidence available to support their claims not being statute barred or to support the magnitude of any claim they may make. Further, PTTEP AAA lodged an appeal on 13 December 2021 against the first instance judgment in its entirety. No provision has been raised in relation to this matter due to the current status of the case as presented above.

- As at 31 December 2021, the Company had contingent liabilities in the form of letters of guarantee with an amount equivalent to US Dollar 292.94 million (Baht 9,790.03 million) for the separate financial statements and with an equivalent to US Dollar 430.30 million (Baht 14,380.41 million) for the consolidated financial statements.

36.3 Commitments

Commitment from the guarantee of debentures and loans of subsidiaries

The Company has commitment for the guarantee of unsecured and unsubordinated capital debenture of US Dollar 490 million for PTTEP Canada International Finance Limited (PTTEP CIF), a subsidiary of the Group.

The Company has commitment for the guarantee of unsecured and unsubordinated capital debentures of Baht 15,000 million and US Dollar 1,500 million for PTTEP Treasury Center Company Limited (PTTEP TC), a subsidiary of the Group.

The Company has commitment for the guarantee of unsecured and unsubordinated loans of US Dollar 600 million for PTTEP TC.

The Company has commitment for the guarantee of a cross currency swap transaction for PTTEP TC to swap Baht debenture for US Dollar with guaranteed amount of US Dollar 360 million.

The Company has commitment for the guarantee of the interest rate collar (zero cost collar) for PTTEP TC with guaranteed amount of US Dollar 150 million.

The Company has commitment for the guarantee of senior debt financing agreements of a subsidiary of Moz LNG1 Holding Company Ltd with the facility in the amount of US Dollar 14,900 million, which is guaranteed by the Company based on the Group's participating interest in Moz LNG1 Holding Company Ltd of 8.5%, which is equivalent to US Dollar 1,267 million.

The Company has commitment for the guarantee of PTTEP TC's short-term US Dollar loan agreement which is committed revolving credit facilities with a financial institution. The total loan facility is in amount of US Dollar 400 million. As at 31 December 2021, there is unutilised credit facilities of US Dollar 400 million.

37 Events occurring after the reporting date

On 10 January 2022, MoZ LNG1 Holding Company Ltd (HoldCo), an associate of the Group, increased its authorised share capital amounting to US Dollar 20.66 million by issuing 20.66 million new ordinary shares at a par value of US Dollar 1 each. The Group has paid-up shares in the Group's shareholding to US Dollar 1.76 million.

On 18 January 2022, HoldCo increased its authorised share capital amounting to US Dollar 54.07 million by issuing 54.07 million new ordinary shares at a par value of US Dollar 1 each. The Group has paid-up shares in the Group's shareholding to US Dollar 4.60 million.

On 20 January 2022, PTTEP Energy Holding (Thailand) Company Limited (PTTEP EH), a subsidiary of the Company, increased its authorised share capital amounting to Baht 182.85 million by issuing 1.83 million new ordinary shares at a par value of Baht 100 each. The Company has paid-up shares in the Company's shareholding to US Dollar 5.45 million.

On 21 January 2022, TotalEnergies EP Myanmar, a partner and operator of Yadana and Moattama Gas Transportation Company (MGTC) project with participating interest of 31.2375%, has notified its intention to withdraw, as both partner and operator, from the project. TotalEnergies EP Myanmar will continue its operatorship of the project for the next 6 months to maintain continuity in gas production. The Group is in process of considering its direction.

Supplemental Information on Petroleum Exploration and Production Activities (Unaudited)

(A) PTTEP and Our Subsidiaries' Petroleum Reserves Report as of December 31, 2021

The total Proved Reserves of PTTEP and our subsidiaries as of December 31, 2021 are shown in the attached table. The Proved Reserves are reviewed annually by Company's earth scientists and reservoir engineers to ensure rigorous professional standards. The Proved Reserves are reported on a gross basis, which includes the Company's net working interest and related host country's interest.

Furthermore, in order to improve efficiency, check and balance of the reserves estimation, reporting and disclosure, the company maintains a Reserves Committee which has the following roles and responsibilities:

- Review and endorse the Company's Annual Reserves
- Review and approve Major Changes of Reserves, and Reserves for Newly-Acquired Project
- Ensure that all activities that related to reserves estimation and disclosure of reserves information conform to regulatory and legal requirements as well as to corporate and international standards
- Approve Annual Reserves Audit Plan, appoint Reserves Auditor, as well as approve Reserves Audit Report to ensure compliance with Company's framework and continual process improvement

As of December 31, 2021, the total amount of Proved Reserves of PTTEP Group's projects⁽¹⁾ was 357 million stock-tank barrels (MMSTB) of crude oil and condensate⁽²⁾ and 5,973 billion standard cubic feet (BSCF) of natural gas or 993 million barrels of oil equivalent (MMBOE). The total amount of Proved Reserves in terms of oil equivalent was therefore 1,350 MMBOE.

In 2021, the total production of PTTEP Group⁽¹⁾ was 181 MMBOE, consisting of 48 MMSTB of crude oil and condensate⁽²⁾ and 821 BSCF of natural gas or 133 MMBOE. This was equivalent to the average production rate of 494,877 barrels of oil equivalent per day (BOED) which was approximately 72,599 BOED or 17% increase from the previous year. The increase in production mainly comes from the production of the newly acquired Oman Block 61 in 2021, and the first production from Rotan and Buluh offshore gas fields in Sabah, Malaysia Project.

⁽¹⁾ Include APICO Joint Venture project

⁽²⁾ Include Natural Gas Liquids (NGL)

PTT Exploration and Production Public Company Limited
Crude Oil and Condensate and Natural Gas Proved Reserves⁽¹⁾

	Crude Oil and Condensate ⁽²⁾			Natural Gas			Barrel of Oil Equivalent		
	(MMSTB)			(BSCF)			(MMBOE)		
	Domestic	Foreign	Total	Domestic	Foreign	Total	Domestic	Foreign	Total
Company's share of proved reserves of consolidated companies									
As of December 31, 2019	123	187	310	2,704	2,377	5,081	564	574	1,138
1) Revision of previous estimates	9	4	13	145	23	168	33	9	42
2) Improved recovery	1	6	7	1	0	1	1	6	7
3) Extensions and discoveries	6	6	12	165	2	167	33	6	39
4) Purchases/Sales of Petroleum in place	-	-	-	-	-	-	-	-	-
5) Production	(27)	(20)	(47)	(435)	(231)	(666)	(98)	(55)	(153)
As of December 31, 2020	112	183	295	2,580	2,171	4,751	533	540	1,073
Company's share of proved reserves of consolidated companies									
As of December 31, 2020	112	183	295	2,580	2,171	4,751	533	540	1,073
1) Revision of previous estimates	7	4	11	51	(25)	26	15	2	17
2) Improved recovery	2	-	2	2	-	2	3	-	3
3) Extensions and discoveries	20	8	28	781	48	829	147	15	162
4) Purchases/Sales of Petroleum in place	-	69	69	-	1,117	1,117	-	264	264
5) Production	(26)	(22)	(48)	(470)	(342)	(812)	(103)	(76)	(179)
As of December 31, 2021	115	242	357	2,944	2,969	5,913	595	745	1,340

⁽¹⁾ The Proved Reserves are reported on a gross basis which includes the Company's net working interest and the related host country's interest.

⁽²⁾ Include Natural Gas Liquids (NGL)

PTT Exploration and Production Public Company Limited
Crude Oil and Condensate and Natural Gas Proved Reserves⁽¹⁾

	Crude Oil and Condensate ⁽²⁾			Natural Gas			Barrel of Oil Equivalent		
	(MMSTB)			(BSCF)			(MMBOE)		
	Domestic	Foreign	Total	Domestic	Foreign	Total	Domestic	Foreign	Total
Company's share of proved reserves of equity companies ⁽³⁾									
As of December 31, 2019	0	-	0	16	-	16	2	-	2
1) Revision of previous estimates	-	-	-	-	-	-	0	-	0
2) Improved recovery	-	-	-	-	-	-	-	-	-
3) Extensions and discoveries	0	-	0	2	-	2	1	-	1
4) Purchases/Sales of Petroleum in place	-	-	-	-	-	-	-	-	-
5) Production	(0)	-	(0)	(9)	-	(9)	(2)	-	(2)
As of December 31, 2020	0	-	0	9	-	9	1	-	1
Company's share of proved reserves of equity companies ⁽³⁾									
As of December 31, 2020	0	-	0	9	-	9	1	-	1
1) Revision of previous estimates	-	-	-	(3)	-	(3)	(0)	-	(0)
2) Improved recovery	-	-	-	-	-	-	-	-	-
3) Extensions and discoveries	0	-	0	63	-	63	11	-	11
4) Purchases/Sales of Petroleum in place	-	-	-	-	-	-	-	-	-
5) Production	(0)	-	(0)	(9)	-	(9)	(2)	-	(2)
As of December 31, 2021	0	-	0	60	-	60	10	-	10
Total Proved Reserves									
As of December 31, 2021	115	242	357	3,004	2,969	5,973	605	745	1,350

⁽¹⁾ The Proved Reserves are reported on a gross basis which includes the Company's net working interest and the related host country's interest.

⁽²⁾ Natural Gas Liquids (NGL)

⁽³⁾ Reserves from APICO Joint Venture project

(B) Capitalized Costs Relating to Oil and Gas Producing Activities

Capitalized costs represent cumulative expenditures for proved and unproved properties together with related accumulated depreciation, depletion, amortization and allowance for impairment loss on assets.

Proved properties include exploration wells, development wells, transportation pipeline, producing facilities, right-of-use assets and decommissioning costs. Unproved properties represent amounts associated with capitalized cost of projects which have not yet found proved reserves.

(Unit : Million US Dollar)	2021	2020
Proved properties	36,055	32,435
Unproved properties	4,446	4,694
Gross capitalized costs	40,501	37,129
Accumulated depreciation, depletion, amortization and allowance for impairment	(25,588)	(23,996)
Net capitalized costs	14,913	13,133

(C) Costs Incurred in Oil and Gas Property Acquisition, Exploration, and Development Activities

Costs incurred in oil and gas property acquisition, exploration and development activities represent amounts both capitalized and charged to expense during the year.

Property acquisition costs include costs to purchase proved and unproved properties.

Exploration costs include geological and geophysical expenses, exploratory drilling cost as well as reservation fee for exploration blocks.

Development costs include costs associated with drilling and equipping development wells, improved recovery systems, facilities for extraction, treating, gathering and storage, producing facilities for existing developed reserves, and costs associated with transportation pipeline.

(Unit : Million US Dollar)	2021			2020		
	Domestic	Foreign	Total	Domestic	Foreign	Total
Acquisition of properties						
- Proved	19	2,300	2,319	8	-	8
- Unproved	-	3	3	-	1	1
Exploration costs	44	157	201	21	133	154
Development costs	799	832	1,631	669	510	1,179
Total	862	3,292	4,154	698	644	1,342

(D) Results of operations for producing activities

Results of operations from oil and gas producing activities for the year 2021 and 2020 are shown in the following table.

Operating expenses include lifting costs incurred to operate and maintain productive wells and related equipment.

Exploration expenses consist of geological and geophysical costs, and exploratory well including project cost write off expenses.

Administrative expenses are expenses directly related to oil and gas producing activities.

Depreciation, depletion and amortization expenses relates to capitalized costs incurred in acquisition, exploration and development activities, transportation pipeline, including amortized decommissioning costs.

Other expenses (income) mainly include impairment loss on assets, foreign exchange gains and losses directly related to oil and gas producing activities and other income.

Income tax expenses are based on the results of operations from petroleum producing activities.

General corporate overhead and finance costs are excluded from the results of operations for petroleum producing activities.

(Unit : Million US Dollar)	2021			2020		
	Domestic	Foreign	Total	Domestic	Foreign	Total
Revenues						
Revenues from sales – Related parties	4,074	1,029	5,103	3,290	864	4,154
Revenues from sales – Third parties	231	1,677	1,908	251	961	1,212
Total revenues from sales	4,305	2,706	7,011	3,541	1,825	5,366
Expenses						
Operating expenses	454	623	1,077	461	583	1,044
Exploration expenses	0	226	226	5	99	104
Administrative expenses	43	96	139	32	99	131
Petroleum royalties	501	29	530	408	2	410
Depreciation, depletion and amortization	1,339	825	2,164	1,392	659	2,051
Other (income) / expenses	3	(222)	(219)	(33)	89	56
Total expenses	2,340	1,577	3,917	2,265	1,531	3,796
Results before income taxes	1,965	1,129	3,094	1,276	294	1,570
Income tax expenses	691	630	1,321	385	198	583
Net results of operations	1,274	499	1,773	891	96	987

(E) **Standardized Measure of Discounted Future Net Cash Flows (SMDCF) Relating to the Proved Oil and Gas Reserves**

The standardized measure of discounted future net cash flows related to the above proved oil and gas reserves, is computed by applying 12-month average prices* (with consideration of price changes only to the extent provided by contractual arrangements), to the estimated future production of year-end remaining proved oil and gas reserves less estimated future expenditures (based on year-end costs) to be incurred in developing and producing the proved reserves.

Future income taxes are calculated by applying the appropriate year-end statutory tax rates to the future pre-tax net cash flows and deducted by applicable tax deductions or tax credits.

Net Cash flows are discounted using a rate of 10% per year to reflect the estimated timing of the future cash flows.

The estimation of discounted future net cash flow shown below is not intended to represent the fair value of oil and gas properties. The fair value should take into account of several factors, such as probable and possible reserves which may turn into proved reserves in the future, anticipated future oil and gas prices, interest rates, changes in development and production costs and risks associated with future production. Therefore, the fair value will subject to the view and perception of analyst.

* Twelve-month average prices are calculated as the unweighted arithmetic average of the first-day-of-the-month price for each month.

Standardized Measure of Discounted Future Net Cash Flows Relating to Prove Oil and Gas Reserves

(Unit : Million US Dollar)	Domestic		Foreign		Total	
	2021	2020	2021	2020	2021	2020
Future cash inflows	15,555	14,293	23,197	13,375	38,752	27,668
Future production costs	(5,872)	(2,578)	(5,797)	(3,932)	(11,669)	(6,510)
Future development costs	(4,758)	(7,124)	(3,603)	(3,343)	(8,361)	(10,467)
Future income tax expenses	(1,261)	(1,307)	(3,456)	(1,410)	(4,717)	(2,717)
Future net cash flows	3,664	3,284	10,341	4,690	14,005	7,974
10% annual discount	(678)	(569)	(5,243)	(2,247)	(5,921)	(2,816)
Standardized measure of discounted future net cash flows (SMDCF) of consolidated companies	2,986	2,715	5,098	2,443	8,084	5,158
SMDCF of equity companies ⁽¹⁾	145	14	-	-	145	14
Total SMDCF	3,131	2,729	5,098	2,443	8,229	5,172

Changes in Standardized Measure of Discounted Future Net Cash Flows Relating to Proved Oil and Gas Reserves

(Unit : Million US Dollar)	2021	2020
Present value at beginning of year of consolidated companies	5,158	8,477
Sales and transfers of oil and gas produced, net of production costs during period	(4,624)	(3,624)
Development costs incurred during the period	1,842	1,437
Net changes in prices and production costs	5,794	(7,387)
Net changes in development costs	(343)	340
Extensions, discoveries and improved recovery	1,334	399
Revisions of previous quantity estimates	233	559
Purchases / sales of petroleum in place	3,795	-
Accretions of discount	(3,105)	2,314
Net changes in income taxes	(2,000)	2,643
Present value at the year end of consolidated companies	8,084	5,158
Present value at the year end of equity company ⁽¹⁾	145	14
Total Present value at the year end	8,229	5,172

⁽¹⁾ included investment in APICO Joint Venture project

(F) Other Information

Producing Oil and Gas Wells

The numbers of producing wells⁽¹⁾ as of December 31, 2021 were as follows:

	Oil	Gas
Thailand	1,440	1,616
Overseas:		
Southeast Asia	118	363
Others	9,307	124
Total	10,865	2,103

Definition of producing wells:

- Producing wells: wells which are either currently producing or temporary closed, but exclude water disposal wells or wells which have been plugged & abandoned.
- Producing Oil wells: wells which primarily produce oil, with or without associated gas.
- Producing Gas wells: wells which primarily produce natural gas, with or without associated liquids.

Drilling in Progress of Oil and Gas Wells

The numbers of wells in progress as at December 31, 2021 were as follows:

	Number of Well ⁽¹⁾
<u>Exploratory</u>	
Thailand	1
Overseas:	
Southeast Asia	-
Others	1
Total	2
<u>Development</u>	
Thailand	17
Overseas:	
Southeast Asia	3
Others	5
Total	25

⁽¹⁾ Total number of wells reported at 100% (Gross), not only PTTEP's participating interest

Oil and Gas Wells⁽¹⁾ Drilled Annually in 2021

	Technical Success	Dry Well
<u>Exploratory</u>		
Thailand	5	-
Overseas:		
Southeast Asia	5	1
Others	1	2
Total	11	3
	Productive Well	Dry Well
<u>Development</u>		
Thailand	245	6
Overseas:		
Southeast Asia	48	-
Others	20	-
Total	313	6

⁽¹⁾ Total number of wells reported at 100% (Gross), not only PTTEP's participating interest

Quarterly information in 2021 and 2020 for the consolidated financial statements are as follows:

Unit: Thousand US Dollar

<u>Year 2021</u>	<u>4thQ</u>	<u>3rdQ</u>	<u>2ndQ</u>	<u>1stQ</u>
Revenues				
Revenue from sales	1,867,008	1,743,639	1,728,895	1,391,318
Revenue from pipeline transportation	26,248	26,686	19,804	20,409
Other income				
Gain on foreign exchange rates	4,946	-	-	-
Gain from a bargain purchase	(8,097)	-	-	349,971
Interest income	3,428	3,465	4,726	5,131
Other income	95,068	10,459	14,392	11,675
Total Revenues	1,988,601	1,784,249	1,767,817	1,778,504
Expenses				
Operating expenses	275,037	219,801	192,455	174,202
Exploration expenses	19,698	50,285	7,464	148,805
Administrative expenses	125,534	71,625	82,935	74,945
Petroleum royalties	142,654	131,997	137,964	117,600
Depreciation, depletion and amortisation	419,870	605,821	629,714	546,659
Other expenses				
Loss on foreign exchange rates	-	36,323	1,753	4,462
Loss on remeasuring of financial instruments	6,529	5,052	124,350	98,359
Impairment loss on assets and goodwill	183,000	-	-	-
Finance costs	50,826	52,008	51,372	48,020
Total Expenses	1,223,148	1,172,912	1,228,007	1,213,052
Share of profit of associates and joint ventures	3,305	6,895	2,795	2,179
Profit before income taxes	768,758	618,232	542,605	567,631
Income taxes	(447,941)	(326,179)	(320,957)	(191,611)
Profit for the period	320,817	292,053	221,648	376,020
Earnings per share				
Basic earnings per share	0.08	0.07	0.06	0.09

Unit: Thousand US Dollar

<u>Year 2020</u>	<u>4thQ</u>	<u>3rdQ</u>	<u>2ndQ</u>	<u>1stQ</u>
Revenues				
Revenue from sales	1,292,490	1,228,270	1,040,554	1,481,856
Revenue from pipeline transportation	18,582	25,150	24,965	23,653
Other income				
Gain on foreign exchange rates	19,279	9,532	9,256	-
Gain on remeasuring of financial instruments	-	27,424	-	221,687
Gain on debt modification	-	-	-	22,307
Interest income	7,451	7,639	8,398	13,241
Other income	9,698	7,222	11,439	8,653
Total Revenues	1,347,500	1,305,237	1,094,612	1,771,397
Expenses				
Operating expenses	234,095	181,110	183,427	196,480
Exploration expenses	26,821	8,311	30,558	38,624
Administrative expenses	117,061	68,934	62,362	65,760
Petroleum royalties	103,709	105,316	78,221	122,908
Depreciation, depletion and amortisation	547,871	514,705	487,111	536,396
Other expenses				
Loss on foreign exchange rates	-	-	-	12,005
Loss on remeasuring of financial instruments	72,158	-	77,622	-
Impairment loss on assets and goodwill	44,072	-	47,504	-
Other expenses	-	-	-	20,341
Finance costs	66,930	61,816	60,872	64,858
Total Expenses	1,212,717	940,192	1,027,677	1,057,372
Share of profit (loss) of associates and joint ventures	25,083	4,593	(1,811)	13,771
Profit before income taxes	159,866	369,638	65,124	727,796
Income taxes	(79,321)	(139,745)	68,661	(452,475)
Profit for the period	80,545	229,893	133,785	275,321
Earnings per share				
Basic earnings per share	0.02	0.06	0.03	0.07

Petroleum Sales Volume and Average Unit Prices

	2021	2020
Net sales of petroleum (BOED)	416,141	354,052
Average petroleum unit prices		
Average unit prices of crude oil and condensate (USD/BBL)	66.70	41.55
Average unit prices of natural gas (USD/MMBTU)	5.69	6.27
Average unit prices of petroleum (USD/BOE)	43.49	38.92
Lifting cost (USD/BOE)	4.13	4.47



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