

Form 56-1

As of December 31, 2019

PTT Exploration and Production Public Company Limited

Table of Contents

	Page
Section 1	Business Overview
1.	Policy and Business Operations Overview 1
2.	Nature of Business Operation 27
3.	Risk Factors 48
4.	PTTEP and Our Subsidiaries' Assets 58
5.	Legal Dispute 69
6.	General Information and Other Significant Information 70
Section 2	Corporate Governance
7.	Securities and Shareholders 1
8.	Management Structure 8
9.	Corporate Governance 40
10.	Corporate Social Responsibility 92
11.	Internal Controls and Risk Management 94
12.	Connected Transactions 104
Section 3	Financial Position and Performance
13.	Significant Financial Information 1
14.	Management Discussion and Analysis of Operating Results 7
Information Certification	
Attachments	
Attachment 1	Information of the Board of Directors, Management, Controlling Persons, and Corporate Secretary
Attachment 2	Directors of Subsidiaries and Associated Companies
Attachment 3	Details of Head of the Internal Audit Division and Head of the Compliance Function
Attachment 4	Asset Revaluation
Attachment 5	Supplemental Information on Petroleum Exploration and Production Activities (Unaudited)

1. Policy and Business Operations Overview

1.1 Vision, Mission, Objective and Strategy

PTTEP is Thailand's leading E&P Company with the mission to sustainably explore, secure energy resources and produce domestically and around the globe, while generating satisfactory return to our shareholders and stakeholders. The Company has a new strategy "Expand and Execute" in order to enhance the company's competitive advantage and maintain sustainable growth. The Company's mission and vision are shown 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.

Goal and Objective: The Company's objective is to create a balance between strong performance and business sustainability, with the aim of maintaining and achieving the following long term goals:

- Unit cost in the top quartile among peers
- Proved reserves to production ratio (R/P Ratio) of more than 7 years
- Average production growth of 5% (CAGR) till year 2030

Strategy: To attain the above, PTTEP have formulated 2 strategies: (1) Expand and (2) Execute as follows:

(1) Expand: Strategy to focus growth in strategic investment areas and diversify into energy related businesses for long-term sustainability

- **Coming-Home Strategy:** PTTEP focuses investments in Thailand and South East Asia where the Company targets as strategic investment areas. Moreover, PTTEP also looks to expand business opportunities such as pursuing Gas Value Chain business in Myanmar in the form of Gas to Power.

- **Strategic Alliance Strategy:** PTTEP aims to capture investment opportunity in other petroleum prolific areas with strategic alliances by mainly focusing on the Middle East.

- **Sustainable Development Strategy:** PTTEP plans to invest in businesses focusing on technology and innovation as well as R&D capability to support core E&P business and future investment opportunity related to the energy industry.

(2) Execute: Strategy to increase sales volume of legacy assets and maintain competitive advantage

- Create full value from existing assets with the emphasis on increasing production from key assets
- Maintain cost competitiveness through digital and organizational transformation
- Accelerate key development projects such as the Mozambique Rovuma Offshore Area 1 project and Hassi Bir Rakaiz project by closely monitoring their statuses and providing any necessary support
- Effectively execute the transitions for Bongkot, Erawan and newly acquired assets

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 of Directors for acknowledgement on a quarterly basis.

1.2 PTTEP Sustainability Management

1.2.1 Sustainability Management Overview

PTTEP's Sustainability Management is an integration of environmental and social responsibility into 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 environmental and social issues as well as to create value for the Company and our stakeholders. Sustainability targets and strategies, and their implementation are driven by efficient business processes, funding, Governance, Risk and Compliance (GRC) management, innovation and technology, cost reduction, and human capability development to enhance production and to achieve work efficiency. To accomplish this, we have adopted His Majesty the late King Bhumibol Adulyadej's (Rama IX) Sufficiency Economy Philosophy (SEP) as the 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 and 14, while continuing our support for the rest of the SDGs in our routine operations. Further, we use the Dow Jones Sustainability Indices (DJSI) to measure our sustainability performance at the international level.

In 2019, PTTEP was selected as a DJSI member in the World Oil and Gas Upstream & Integrated Industry for the sixth consecutive year and also named the Industry Leader in this category for the second time since the first one received in 2016. In addition, we were chosen as a member of the FTSE4Good Index Series for the fourth consecutive year. Additionally, in 2019, we received the SET Awards 2019 in Best Sustainability Awards from the Stock Exchange of Thailand (SET).

1.2.2 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 (2008) (AA1000APS), and SASB Materiality Map™ by Sustainability Standards Board (SASB). This includes a thorough review of the current and future business risks and opportunities in the business, social and environmental dimensions, so as 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 2019, eight material sustainability issues of importance were identified and prioritized from the process of engaging with our stakeholders and top management through the standard materiality assessment process. The eight issues are listed below:

Business Dimension

- GRC – Governance, Risk Management and Compliance
- Increasing Petroleum Reserves
- 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 process for identifying the material sustainability issues for 2019 included a structured and systematic review of the issues with significant business, environmental and social impacts on the Company as well as those issues which are important to our internal and external stakeholders. The assessment was conducted by identifying and assessing the material issues from the Company's and the stakeholder's perspectives, defining reporting boundaries, and prioritizing the issues from their levels of significance, using agreed criteria and stakeholder engagement. The result was subsequently submitted to the Management Committee and the Board of Directors for content review and approval. Additional details can be found at:

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

1.2.3 Environmental and Social Contribution

According to PTTEP's sustainable development policy, the Company continuously implements the environmental and social programs. New and ongoing key environmental projects in 2019 are the flash & flare gas recovery and utilization, methane (CH₄) survey and leak reduction (in process), replacement of the membrane to improve the removal of the CO₂ content from natural gas, energy efficiency improvement through the optimization of the heat recovery steam generators, seawater cooling water pumps, and the logistics fleet management projects. In 2019, these projects totally contributed to the reduction of greenhouse gas emissions of 256,498 tonnes carbon dioxide equivalent (CO₂e) per year, while generating revenue and saving costs of approximately THB 676.543 million from hydrocarbon recovery and energy efficiency improvement.

We also carry out other programs which create socio-economic value such as the Crab Hatchery Learning Center Project, which was established in 2013 and was a joint initiative between PTTEP and the community in Hua Khao Sub-district, Songkhla Province, in collaboration with the National Institute of Coastal Aquaculture (NICA) and the network of local fishermen. The project objective is to develop knowledge on crab hatching techniques, which consequently help to replenish marine resources, safeguard the livelihoods of local fishermen and promote sustainable fishery practices. Since then, the project has been replicated in other areas and there were four learning centers by the end of December 2019, leading to the establishment of 33 conservation networks and 25 marine conservation zones covering an area of 18 square kilometers. The Crab Hatchery Learning Center is one of our social development initiatives that demonstrates the Company's intention to combine our expertise with local wisdom to solve problems and to strengthen local communities in a sustainable way. We believe that this effort will lead to social license to operate for our business, prevent potential significant impacts on the environment and communities, and indirectly reduce our operating costs.

1.3 Development and Significant Changes in 2019

Since 2019, PTTEP has operated through the strategies, “Expand” and “Execute”, to create and achieve sustainable growth. The Company has succeeded in expanding its investment in strategic areas based on the “Expand” strategy with the focus in Southeast Asia (“Coming Home” Strategy) and the Middle East with strategic partners (“Strategic Alliance”). For “Execute”, which is the strategy to achieve competitive performance through efficiency and adoption of new technology and to maintain the production plateau, as well as to ensure smooth operational transitions of recently acquired assets i.e. the exploration blocks in the Gulf of Thailand, G1/61 Project (Erawan Field) and G2/61 Project (Bongkot Field), assets in Malaysia and under Partex. Moreover, PTTEP has continued to accelerate the Final Investment Decision (FID) of the Pre-Development projects and to accelerate exploration activities of projects for long-term reserves addition. The following are the highlights of these developments and changes by region.

Thailand

In February 2019, the Company signed the Share Purchase Agreement (“SPA”) to acquire 33.8% stake in APICO LLC, a joint venture of Sinphuhorm Project from Tatex Thailand LLC and Tatex Thailand II LLC. After the completion of the transaction, PTTEP’s stake (both direct and indirect) in this project increased to 66.8%.

In February 2019, the Company, together with MP G2 (Thailand) Limited, a subsidiary of Mubadala Petroleum (Thailand) Holdings Limited, signed the Production Sharing Contract (PSC) in G1/61 (Erawan Field) with the holding interest of 60% and 40% respectively. For G2/61 (Bongkot Field), the Company signed the PSC with the holding interest of 100%. PTTEP is also the operator of both fields. Under the PSCs, the minimum production volume of Erawan and Bongkot fields are committed at 800 and 700 MMSCFD respectively while production will start from 2022-2023.

In July 2019, the Company entered into the Share Purchase Agreement (“SPA”) to acquire additional 39% stake in APICO LLC from Coastal Energy Company (Khorat) Limited. After the completion of the transaction, PTTEP’s stake in this project increased from 66.80% to 80.48%.

Other South East Asia

In March 2019, the Company signed a Share Sale and Purchase Agreement (“SSPA”) to acquire the 100% of Murphy Oil Corporation’s (“Murphy”) business in Malaysia through the equity in two subsidiaries of Murphy; Murphy Sarawak Oil Company Limited (“Murphy Sarawak”) and Murphy Sabah Oil Company Limited (“Murphy Sabah”). These two companies held 5 projects: 2 producing, 1 development and 2 exploration projects, including the SK309 & SK311 Project, the Sabah K Project, the Sabah H Project, the SK314A Project and the SK405B Project. The acquisition was completed in July 2019 and resulted in incremental petroleum sales volume to PTTEP is approximately 48,000 barrels of oil equivalent per day (BOED) and ramping up to 60,000-70,000 BOED in 2022.

In March 2019, the Company and PETRONAS Carigali Sdn. Bhd. (PCSB) signed Production Sharing Contracts with Petroliam Nasional Berhad (PETRONAS) for exploration and production rights of 2 blocks located in offshore Peninsular Malaysia. One is PM407, which PTTEP holds 55% participation interests and PCSB holds 45% participation interests. The other is PM415, which PTTEP holds 70% participation interests and PCSB holds 30% participation interests.

In June 2019, the Company made a discovery of gas at the Lang Lebah-1RDR2, the first exploration well in Sarawak SK410B Project located in offshore Sarawak, Malaysia. The wells encountered 252 meters of net gas pay, indicating multi-TCF gas discovery. The consortium consists of PTTEP HKO (the Operator), KUFPEC and PETRONAS Carigali Sdn. Bhd. with participating interests of 42.5%, 42.5% and 15% respectively.

In September 2019, Myanmar M11 Project submitted a request to relinquish the exploration block after the fulfillment of the requirements under the Production Sharing Contract, with no commercial discovery. The request is awaiting approval from the government.

Middle East

In January 2019, the Company and Eni Abu Dhabi B.V., a wholly-owned subsidiary of Eni were selected as the successful bidders from the Abu Dhabi's Open Block Licensing Round for exploration and production rights of two offshore blocks named Offshore 1 and Offshore 2 which are located in the north-west of Abu Dhabi, the United Arab Emirates. The consortium consists of PTTEP MENA Limited and Eni Abu Dhabi B.V. (the Operator) with participating interests of 30% and 70% respectively.

In June 2019, the Company signed a Share Purchase Agreement ("SPA") to acquire a 100% stake in Partex Holding B.V. (Partex) from Calouste Gulbenkian Foundation. Partex held 7 projects, primarily as a non-operating partner, in 5 countries with the focus areas in the Sultanate of Oman (Oman) and the United Arab Emirates (UAE) including The PDO (Block 6) Project, The Mukhaizna (Block 53) Project, Oman LNG Project (OLNG) and ADNOC Gas Processing Project (AGP). The acquisition was completed in November 2019. As a result, the incremental petroleum sales volume to PTTEP is approximately 16,000 barrels of oil equivalent per day (BOED).

Africa

In March 2019, the Company, together with SONATRACH (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 first oil production for the initial phase of 10,000-13,000 barrels per day (BPD) is expected in early 2021 with a plan for the second phase production capacity ramping up to around 50,000-60,000 BPD in 2025. PTTEP holds 24.5% participation interest and the other joint venture partners consist of SONATRACH and CNOOC Limited hold participation interest of 51% and 24.5%, respectively.

In June 2019, the Company, 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 two onshore liquefaction trains. This official declaration of FID signifies that the project will advance to the construction phase to develop the Golfinho-Atum natural gas accumulations located in offshore Area 1 with the onshore LNG facility of the first two liquefaction trains, a total nameplate capacity of 12.88 million tons per annum (MTPA). The project has successfully secured the long-term LNG sales of 11.1 MTPA, representing more than 80% of the plant's capacity. Designated as "First Mover" by the Government of Mozambique, the Mozambique Area 1 Project will also be responsible for the construction of the support facilities to be shared with Area 4 Project. In addition, the project holds substantial recoverable natural gas resources of approximately 75 trillion cubic feet (TCF) and potentially on the path to become one of the world's largest emerging LNG supply hubs. This project will add, to PTTEP's portfolio, the total estimated proved reserves (1P) of approximately 140 million barrels of oil equivalent (MMBOE), according to working interest and is expected to deliver 1st Cargo by 2024.

Australasia

In March 2019, the Company reported the successful drilling results of the exploration well, Orchid-1 in Permit AC/P54 and encountered gas and condensate with the net pay thickness around 34 metres. The well result will be incorporated in development planning of Cash-Maple field, with total of 3.5 TCF resources.

1.4 Shareholding Structure of PTTEP Group

1.4.1 Business Overview

PTTEP's core business is exploration and production of petroleum in Thailand and foreign countries. As of December 31, 2019, PTTEP Group had petroleum exploration and production projects in 15 countries with details as follows:

No.	Project Name	Phase	Location	Participation Interest	Operator
Thailand					
1	Bongkot Project	Production	Gulf of Thailand	66.6667%	PTTEP
2	S1 Project	Production	Upper Central	100%	PTTEP
3	PTTEP 1 Project	Production	Central	100%	PTTEP
4	B6/27 Project	Production	Gulf of Thailand	100%	PTTEP
5	Arthit Project	Production	Gulf of Thailand	80%	PTTEP
6	L22/43 Project	Production	Upper Central	100%	PTTEP
7	L53/43 & L54/43 Project	Production	Central	100%	PTTEP
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% ¹	PTTEP
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% ²	PTTEP
16	G2/61 Project	Exploration	Gulf of Thailand	100% ²	PTTEP
Overlapping Area					
1	MTJDA Project	Production	Thailand-Malaysia	50%	CPOC
2	G9/43 Project	Exploration	Thailand-Cambodia	100%	PTTEP
Overseas					
Myanmar					
1	Zawtika Project	Production	Gulf of Moattama	80%	PTTEP
2	Yadana Project	Production	Gulf of Moattama	25.5%	Total

¹ PTTEP holds directly and indirectly 80.48% 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.

² PTTEP was awarded the rights of petroleum exploration and production for Block G1/61 and G2/61 in December 2018 and signed the Production Sharing Contracts on February 25, 2019.

No.	Project Name	Phase	Location	Participation Interest	Operator
3	Yetagun Project	Production	Gulf of Moattama	19.31784%	Petronas
4	Myanmar M3 Project	Exploration	Gulf of Moattama	80%	PTTEP
5	Myanmar M11 Project ³	Exploration	Gulf of Moattama	100%	PTTEP
6	Myanmar MD-7 Project	Exploration	Andaman Sea	50%	PTTEP
7	Myanmar MOGE 3 Project	Exploration	Onshore	77.5% ⁴	PTTEP
Malaysia					
1	Malaysia Project ⁵	Exploration/ Development/ Production	Offshore	6.4-80% ⁶	PTTEP ⁶
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%	Petrovietnam
4	Vietnam 52/97 Project	Exploration	Offshore	7%	Petrovietnam
Indonesia					
1	Natuna Sea A Project	Production	Offshore	11.5%	Premier Oil
Kazakhstan					
1	Dunga Project ⁷	Production	Onshore	20%	Total
Oman					
1	PDO (Block 6) Project ⁷	Production	Onshore	2%	Petroleum Development Oman
2	Mukhaizna (Block 53) Project ⁷	Production	Onshore	1%	Occidental Petroleum

³ On September 26, 2019, PTTEP submitted a request to terminate and return the exploration block of Myanmar M11 Project after fulfillment of the requirements of the Production Sharing Contract. The termination will be effective after receiving the official approval from the Government of the Republic of the Union of Myanmar.

⁴ On February 28, 2019, PTTEP received the approval from the Government of the Republic of the Union of Myanmar to receive the transfer of the participating interest in MOGE 3 Project from other partners. As a result, PTTEP's participating interests increased from 75% to 77.5% and PTTEP is the operator of the project.

⁵ On March 21, 2019, PTTEP signed the Share Sale and Purchase Agreement to acquire 100% of Murphy Oil Corporation's business in Malaysia, the conditions precedent to closing prescribed in the agreement was completed in July 2019. Subsequently, PTTEP has named investments of all projects in Malaysia under 'Malaysia Project'.

⁶ Malaysia Project holds many petroleum blocks where PTTEP as Operator has various participation interest from 42-80%, except one area named Gumusut-Kakap (GK) in Sabah K Block where PTTEP is a joint venture partner with participation interest of 6.4%, and Shell is the Operator.

⁷ On June 17, 2019, PTTEP signed the Share Purchase Agreement to acquire a 100% stake in Partex Holding B.V. from Calouste Gulbenkian Foundation, the conditions to closing prescribed in the agreement was completed in November 2019.

No.	Project Name	Phase	Location	Participation Interest	Operator
United Arab Emirates					
1	Abu Dhabi Offshore 1 Project ⁸	Exploration	Offshore	30%	Eni Abu Dhabi B.V.
2	Abu Dhabi Offshore 2 Project ⁸	Exploration	Offshore	30%	Eni Abu Dhabi B.V.
Algeria					
1	Algeria 433a & 416b Project	Production	Onshore	35%	GBRS
2	Algeria Hassi Bir Rekaiz Project	Development	Onshore	24.5%	PTTEP
Mozambique					
1	Mozambique Area 1 Project	Development	Offshore	8.5%	Total ⁹
Angola					
1	Block 17/06 Project ⁷	Exploration	Offshore	2.5%	Total
Australia					
1	PTTEP Australasia Project	Exploration	Offshore	90 - 100% ¹⁰	PTTEP
Canada					
1	Mariana Oil Sands Project	Exploration	Onshore	100%	PTTEP
Brazil					
1	Potiguar Project ⁷	Production	Onshore	50%	PTTEP
2	Barreirinhas AP1 Project	Exploration	Offshore	25%	Shell Brasil
3	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

Principal Projects in Operation

The following is a summary of project activities undertaken during 2019. Production and sales figures described hereunder are total production and sales figures for the respective projects.

(1) Project Activity Highlights in Thailand

⁸ PTTEP was selected as the successful bidders for the exploration and production rights of two offshore blocks in United Arab Emirates, named Offshore 1 and Offshore 2 and signed the Concession Agreement with Abu Dhabi National Oil Company on January 12, 2019.

⁹ On September 30, 2019, the acquisition transaction between Anardarko Petroleum Corporation and Occidental Petroleum Corporation was completed, together with the acquisition of African assets between Occidental Petroleum Corporation and Total. Total has officially become the operator of Mozambique Area 1 Project.

¹⁰ PTTEP Australasia Project holds many petroleum blocks which have varying participation interests ranging from 90 - 100%.

Most PTTEP projects in Thailand are in the production phase, located both in the Gulf of Thailand and onshore. The following are highlights of key project activities in Thailand during 2019.

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 Company currently holds 66.6667% interest after the completion of additional stake of 22.2222 in Blocks B15, B16 and B17 from Shell Integrated Gas Thailand Pte. Limited (Shell) and Block G12/48 from Thai Energy Company Limited (a wholly-owned subsidiary of Shell) on June 21, 2018. The Company is the operator. The project has been in production since 1993. All of the natural gas and condensate produced from the Bongkot Field are sold to PTT, under a Take-or-Pay basis pursuant to long-term Gas Sales Agreements (GSA).

During the year 2019, the project continuously drilled production wells to maintain production volumes as planned. The Block G12/48, located adjacent to the east of Bongkot South Field and operated by the Company with 66.6667% working interest, was approved the production area and development plan by the Department of Mineral Fuels, Thailand, in March 2015, and started production in October 20, 2018 through Bongkot South Field's Central Processing platform with the natural gas being sold to PTT under the field's sales contract. Overall, the average sales volume of the project in year 2019 was 810 million standard cubic feet per day (MMSCFD) for natural gas (equivalent to approximately 131,200 barrels of oil equivalent per day (BOED)) and approximately 22,800 barrels per day (BPD) of condensates.

On December 13, 2018, as announced in the bidding result of the expiring concessions in 2022-2023 in the Gulf of Thailand, the Company was solely awarded the rights of petroleum exploration and production and as the operator of Block G2/61 (Bongkot field, consisting of Blocks B15, B16 and B17). Currently, the project is in the transition process to ensure production continuity starting in 2022 until the Production Sharing Contract ends. More information is provided in the G2/61 project.

S1 Project

The S1 Project is the largest onshore oil field in Thailand, with an area covering parts of Kamphaeng Phet, Sukhothai, Phitsanulok, Phichit and Uttaradit provinces. PTTEP is the sole owner and operator. Products from the S1 Project consist of crude oil, natural gas, and liquefied petroleum gas (LPG). Crude oil produced at S1 is sold to PTT which 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 and the other part that goes to a gas plant to separate LPG with both be sold to PTT.

During the year 2019, the project continuously drilled additional production wells with exploration drilling plan in 2019 to maintain its production level. Environmental impact assessments were also undertaken in both existing and new production areas. The project's average crude oil sales volume for the year was approximately 31,000 BPD, while sales volume of natural gas averaged 10 MMSCFD (approximately 1,900 BOED), and average LPG sales volume was 200 metric tons per day (approximately 1,700 BOED).

PTTEP 1 Project

The PTTEP 1 Project is located in Suphan Buri and Nakhon Pathom provinces. PTTEP 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. During the year 2019, the average sales volume of the project for crude oil was approximately 230 BPD.

B6/27 Project

The B6/27 Project is located in the Gulf of Thailand, off the coast of Chumphon Province. PTTEP is the sole owner and operator. Currently, the project is in the process of decommissioning as it is towards the end of the concession contract.

Arthit Project

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

During the year 2019, the project continued the construction and installation of the production platform and gas pipelines in order to maintain production levels. The Block G8/50, located adjacent to the north of Arthit Project and is held and operated by the Company with 80% working interest, had produced through Arthit Project's Central Processing platform with the natural gas being sold to PTT under Arthit Project's sales contract. In March 2019, Block G8/50 ceased production. However, this does not affect the total sales volume of the Arthit project. The average natural gas sales volume for the project in 2019 was approximately 230 MMSCFD (approximately 37,000 BOED) and average condensate sales volume was approximately 11,000 BPD.

L22/43 Project

The L22/43 Project is located in Phitsanulok and Pichit provinces. The Company is the sole owner and operator.

In 2019, the project temporarily shut down with the plan to replace appropriate producing equipment for the field and transfer mobile production facility to support S1 Project. The project plans to continue the production in mid-2020.

L53/43 and L54/43 Project

The L53/43 and L54/43 Project are located in Suphan Buri, Kanchana Buri, Phra Nakhon Si Ayutthaya and Ang Thong provinces. The Company owns 100% interest in the project and is the operator. Crude oil produced from the project is sold to PTT which is transported via truck to the Bangchak refinery.

During the year 2019, the project's average crude oil sales volume was approximately 1,700 BPD. After December 31, 2019, the production ceased due to no further commerciality.

E5 Project

The E5 Project is located in Khon Kaen Province. The Company holds 20% participating interest in the project with ExxonMobil as the operator. 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. PTT then transports the gas via pipelines to EGAT's power plant.

In the year 2019, average natural gas sales volume for the project amounted to 8 MMSCFD (approximately 1,300 BOED).

Contract 3 Project

The Contract 3 Project is located in the Gulf of Thailand, off the coast of Surat Thani Province. The Company 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 in 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 the year 2019, the project continued to carry out development drilling activities in order to maintain production levels. The average sales volume of the project in 2019 was approximately 630 MMSCFD (approximately 106,000 BOED) for natural gas, approximately 18,000 BPD for crude oil and approximately 23,000 BPD for condensates.

Contract 4 Project

The Contract 4 Project and Block G7/50, is located in the Gulf of Thailand. The Company 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 a long-term gas and condensate sales agreements.

In the year 2019, the project sold natural gas at an average rate of approximately 410 MMSCFD (approximately 68,000 BOED) and condensates at an average rate of approximately 18,000 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 Company 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 2019, the project continued to carry out development drilling activities to sustain production level. The sales volume of crude oil and natural gas averaged approximately 3,200 BPD and 2 MMSCFD (equivalent to approximately 280 BOED) respectively.

Sinphuhorm Project (EU-1 and E5-North)

The Sinphuhorm Project is located in Udon Thani and Khon Kaen provinces. PTTEP holds directly and indirectly 80.48% 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. The project has long-term gas sales agreement with PTT and the natural gas will be sent through the pipeline to EGAT's Nam Phong Power Plant.

In May 2019, the project received approval to extend the petroleum production period for another 10 years until 2029 and 2031 for EU-1 and E-5 blocks, respectively. In the year 2019, sales volume of the project averaged approximately 80 MMSCFD for natural gas (approximately 13,900 BOED) and approximately 270 BPD for condensate.

B8/32 & 9A Project

The B8/32 & 9A Project is located in the Gulf of Thailand, off the coast of Chumphon Province. The Company 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 cargo.

During the year 2019, the project continued to carry out development drilling and waterflood operations in order to maintain the crude oil production levels. Sales volume averaged approximately 21,000 BPD for crude oil and approximately 70 MMSCFD for natural gas (approximately 12,000 BOED).

G4/48 Project

The G4/48 Project is located in the Gulf of Thailand, off the coast of Surat Thani Province. PTTEP 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 2019, sales volume from the project averaged 3 MMSCFD for natural gas (equivalent to approximately 480 BOED) and approximately 670 BPD for crude oil.

G1/61 (Erawan field)

The G1/61 Project is an exploration and production project, under 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, PTTEP Energy Development Company Limited (PTTEP ED), a subsidiary of PTTEP, together with MP G2 (Thailand) Limited, a subsidiary of Mubadala Petroleum (Thailand) Holdings Limited, 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 ED as the operator. The Production Sharing Contract (PSC) was later signed on February 25, 2019.

In 2019, the project commenced transition workplan which includes planning for exploration drilling, production platform and gas pipelines, and other studies to ensure gas production delivery at the minimum volume stated in the PSC of 800 MMSCFD starting in 2022 onwards. PTTEP has closely coordinated with the existing concessionaires and the Department of Mineral Fuels to ensure a smooth operational transition.

G2/61 (Bongkot field)

The G2/61 Project is an exploration and production project, under Production Sharing Contract scheme (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 PTTEP 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, PTTEP Energy Development Company Limited (PTTEP ED), a subsidiary of PTTEP, was awarded the right to explore and produce petroleum with the holding interest of 100% of G2/61 (Bongkot field), and as the operator. The Production Sharing Contract (PSC) was later signed on February 25, 2019.

In 2019, the project commenced transition workplan which includes planning for exploration drilling, production platform and gas pipelines, and other studies to ensure gas production delivery at the minimum volume stated in the PSC of 200 MMSCFD in 2022 and 700 MMSCFD in 2023. PTTEP has closely coordinated with the existing concessionaires and the Department of Mineral Fuels to ensure a smooth operational transition.

Projects located in overlapping claims areas

MTJDA Project

PTTEP has a 50% participating interest in the MTJDA Project with Carigali PTTEPI Operating Company Sdn. Bhd. (CPOC) as the operator. PTTEP, PC JDA Ltd. (a subsidiary of 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 Malaysia. Whilst, crude oil and condensates produced from the project were sold through auction.

Since the year 2019, the project has continuously drilled production wells to maintain production level and is currently in the process of planning for additional exploration and appraisal campaign to further evaluate potentials, expected to be completed in 2021. The project has average sales volume for 2019 of approximately 330 MMSCFD (approximately 54,000 BOED) for natural gas and approximately 9,400 BPD for condensates.

G9/43 Project

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

(2) International Projects: PTTEP has overseas projects separated into the following regions.

(2.1) Project Activity Highlights in other South East Asia Countries: PTTEP has projects in this region which are located in the Republic of the Union of Myanmar (Myanmar), the Socialist Republic of Vietnam (Vietnam), Malaysia and the Republic of Indonesia (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 Company holds 80% participating interest and is the operator, with Myanma 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 Company 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.

Since the year 2019, the project has completed the drilling of 6 exploration and appraisal wells in the eastern area and completed the first exploration well in the western area. Currently, the project is in the process of drilling its second exploration well. The project performed a 3D seismic acquisition in the northern part of the area in Q4/2019. Also, to ensure production continuity, the project received approval for the Field Development Plan of Phase 1D from the Government of Myanmar. The average sales volume of natural gas for the project in 2019 was 297 MMSCFD (approximately 48,000 BOED).

Yadana Project

The Yadana Project is a large gas project located in the Gulf of Moattama, Myanmar. The Company holds a 25.5% interest with Total E&P Myanmar (TEPM) 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 Company 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. Consequently, PTT completed an onshore pipeline section from the Thai border to the EGAT power generation plant in Ratchaburi Province.

Since the year 2019, the project has completed 3D seismic acquisition and is currently in the process of data interpretation and plan for further exploration drilling plans. The project prepares to drill the production wells in Yadana and Badamyar fields in January 2020 to maintain production volume and ensure gas delivery as stated in the long-term sales agreement. Overall, in 2019, the project had average gas sales volume of 776 MMSCFD (approximately 96,000 BOED).

Yetagun Project

The Yetagun Project is a natural gas and condensates producing project located in the Gulf of Moattama, Myanmar. The Company holds a 19.31784% interest in the project with PC Myanmar (Hong Kong) Limited as the operator. All 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 Company 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 2019, the project completed the 3D seismic survey with the plan to continue drilling exploration and production wells in order to maintain production plateau. The project's total sales volume averaged 105 MMSCFD (approximately 17,000 BOED) for natural gas and approximately 2,300 BPD for condensates.

Myanmar M3 Project

The Myanmar M3 Project is located in the Gulf of Moattama, Myanmar. The Company owns 80% participating interest in the project and is the operator. The project has submitted a revised Field Development Plan to the Government of Myanmar in Q4/2019 to align with the Gas to Power plan.

The Gas to Power project in Myanmar is aimed to capture market opportunities for E&P business in Myanmar. At its first stage, PTTEP plans to feed the natural gas from Zawtika Project and Myanmar M3 Project to supply a new power plant for domestic consumption due to the high demand of electricity in the country. For the project's progress, PTTEP conducted a feasibility study and had submitted a project framework to the Government of Myanmar. Currently, the project awaits for Myanmar Government's approval to enter the next step of negotiating a power purchase agreement and carry out preliminary engineering.

Myanmar M11 Project

The Myanmar M11 Project is located in the Gulf of Moattama, Myanmar. The Company owns 100% participating interest in the project and is the operator. In 2018, the Myanmar government approved the extension of the exploration period to a total of 5 years (October 23, 2014 – October 22, 2019)

The project completed the drilling of an exploration well in June 2019 with no commercial reserves found and thereby submitted a request to relinquish the block in September 2019 for Myanmar Government's approval after fulfilling the obligations under the Product Sharing Contract. The termination will be effective after receiving official approval from the Government of the Republic of the Union of Myanmar.

Myanmar MD-7 Project

The MD-7 Project is located in deep water in the Gulf of Moattama, Myanmar. The Company has a 50% interest in the project and is the operator. TOTAL E&P Myanmar (TEPM) joined the consortium with 50% participating interest in 2017.

The project is currently in the process of evaluating the fields' resources potential in order to prepare for an exploration well drilling in Q1/2020.

Myanmar MOGE 3 Project

The Myanmar MOGE 3 Project is an onshore project located in Myanmar. PTTEP holds a 77.5% interest and is the operator of this project. On February 28, 2019, PTTEP received approval from the Government of the Republic of the Union of Myanmar to receive the transfer of the participating interest in MOGE 3 Project from other partners.

In the year 2019, four exploration wells were drilled in 2019 and evaluated to have no commercial reserves and thus were written off.

The Malaysia Project

On March 21, 2019, PTTEP HK Offshore Limited (a subsidiary of PTTEP) signed a Share Sale and Purchase Agreement (SSPA) to acquire 100% of Murphy Oil Corporation's (Murphy) business in Malaysia through the equity in two subsidiaries of Murphy: Murphy Sarawak Oil Company Limited (Murphy Sarawak) and Murphy Sabah Oil Company Limited (Murphy Sabah). The agreement was completed in July 2019. Subsequently, PTTEP has named investments of all projects in Malaysia under 'Malaysia Project'. Details are as follow:

The Malaysia: The Block K Project

The 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. The Company holds participating interest of 56% and 22.4% in the Kikeh and SNP field respectively and is the operator. The company holds participating interest of 6.4% in the GK field and Shell is the operator. This project was obtained with the acquisition of Murphy's business in Malaysia in 2019.

In 2019, the Kikeh Subsea Gas Lift – Phase 1 Project, which is an Improved Oil Recovery (IOR) project for the Kikeh subsea production system to optimize the reserves recovery level, was successfully completed. The project has average production volume in 2019 for crude oil of approximately 27,000 BPD¹ and 17 MMSCFD¹ for natural gas (approximately 3,200 BOED).

The Malaysia: Sarawak SK 309 and 311 Project are oil and gas producing fields located in shallow water of offshore Sarawak. The Company holds participating interest of 42% and 59.5% in the East Patricia field and remaining area respectively and is the operator. This project was obtained from the acquisition of Murphy's business in Malaysia in 2019.

Both projects started gas production from the 2 infill gas development wells drilled in the first half of 2019. The projects had a total average production volume in 2019 for crude oil and condensate of approximately 26,000 BPD¹ and natural gas around 270 MMSCFD¹ (approximately 46,800 BOED).

The Malaysia: The Block H Project is made up of natural gas fields in development phase located in deep water offshore Sabah. PTTEP holds 56% interest in Rotan field and 42% interest in the remaining area. This project was obtained from the acquisition of Murphy's business in Malaysia in 2019.

The subsea infrastructure is under construction and scheduled to be completed by Q2/2020. The Petronas Floating LNG host facility that will receive gas from the Block H Project is currently being constructed and remains on schedule for February 2020 sail-away. The first production is expected by Q3/2020 and ramping up to its full capacity of 270 MMSCFD.

The Malaysia: Sarawak SK 410B Project is located in offshore Sarawak, Malaysia. PTTEP holds participating interest of 42.5% in the project and is the operator. In March 2019, the project drilled an exploration well in Lang

¹ The average production volumes per day are calculated from the completion date of acquisition transaction.

Lebah-1RDR2 at 3,810 meters deep and found a natural gas field 252 meters thick which proves the significant discovery of gas. In the year 2019, the project received an approval from Petronas to extend its exploration period to three years, until Q1/2023. The project is currently preparing for additional drilling of an appraisal well to evaluate further upside potential in 2020 along with studying for options on field development plan.

The Malaysia: Sarawak SK 314A Project is a shallow-water project and is located in offshore Sarawak, Malaysia. PTTEP holds participating interest of 59.5% in the project and is the operator. This project was obtained from the acquisition of Murphy's business in Malaysia in 2019.

In 2019, the project received approval from Petronas to extend its exploration period to three years, until November 2022 and was in the process of studying the field's resources potential in order to prepare for the drilling of 2 exploration wells in 2021.

The Malaysia: Sarawak SK 417 Project is located in the shallow-water of offshore Sarawak, Malaysia. PTTEP holds participating interest of 80% in the project and is the operator. In the year 2019, the project was in the process of evaluating the field's resources potential in order to prepare for the drilling of 3 exploration wells in 2020.

The Malaysia: Sarawak SK 438 Project is located in the shallow-water of offshore Sarawak, Malaysia. PTTEP holds participating interest of 80% in the project and is the operator. In the year 2019, the project has revised the exploration drilling plan by synergizing with other project to reduce cost. The project is preparing to drill 3 exploration wells in 2020 which is the same period as nearby blocks.

The Malaysia: Sarawak SK 405B Project is located in the shallow water of offshore Sarawak. The Company has 59.5% interest and is the operator. This project was obtained from the acquisition of Murphy's business in Malaysia in 2019.

In the year 2019, the project was in the process of studying the field's resources potential in order to prepare for the drilling of 1 exploration well in 2020.

The Malaysia: Peninsular PM 407 Project is located in the shallow water of offshore Peninsular, Malaysia. On March 21, 2019, the Company signed Production Sharing Contract with Petroliaam Nasional Berhad (PETRONAS) for exploration and production rights of PM407 Block. PTTEP holds participating interest of 55% and is the operator. In 2019, the project was in the evaluation process for petroleum potential and prepared for 2 exploration wells in 2021.

The Malaysia: Peninsular PM 415 Project is located in the shallow water of offshore Peninsular, Malaysia. On March 21, 2019, the Company signed Production Sharing Contract with Petroliaam Nasional Berhad (PETRONAS) for exploration and production rights of PM415 Block. PTTEP holds participating interest of 70% and is operator. In 2019, the project was in the evaluation process for petroleum potential and prepares for 2 exploration wells in 2020.

Vietnam 9-2 Project

The Vietnam 9-2 Project is located offshore southeast of Vietnam, and PTTEP 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 PetroVietnam Gas, a state owned enterprise, for domestic consumption.

In 2019, the Project was able to maintain production plateau. The Project had average sales volume for crude oil of approximately 4,400 BPD and for natural gas of 14 MMSCFD (approximately 3,000 BOED).

Vietnam 16-1 Project

The Vietnam 16-1 Project is located offshore of Vietnam, with PTTEP holding a 28.5% interest, with Hoang-Long Joint Operating Company as the operator. 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 2019, the project started production from 2 wells and is in process of drilling an additional appraisal well in Q1/2020 in order to maintain production level. The sales volume from the project for 2019 averaged approximately 16,000 BPD of crude oil and 7 MMSCFD of natural gas (approximately 1,700 BOED).

Vietnam B & 48/95 Project

The Vietnam B & 48/95 Project is located offshore of Vietnam. The Company holds 8.5% of participating interest in the project with Petrovietnam 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 of 490 MMSCFD (including production from Vietnam 52/97 Project) by the end of 2023.

Vietnam 52/97 Project

The Vietnam 52/97 Project is located offshore of Vietnam. The Company holds 7% of participating interest in the project with Petrovietnam 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 of 490 MMSCFD (including the production from Vietnam B & 48/95 Project) by the end of 2023.

Natuna Sea A Project

The Natuna Sea A Project is located in the west of the Natuna Sea in Indonesia. In 2013, PTTEP Netherlands Holding Coöperatie U.A. (PTTEP NH), a subsidiary of PTTEP, jointly signed a share purchase agreement with Pertamina Hulu Energy, a subsidiary of 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 auction, while natural gas produced is sold in Singapore for domestic consumption.

In 2019, the project completed the drilling of additional production wells in order to maintain production plateau, with the average sales volume for natural gas of approximately 195 MMSCFD (approximately 34,000 BOED) and for condensates of approximately 1,320 BPD.

(2.2) **Project Activity Highlights in Central Asia:** PTTEP'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 Company holds 20% interest, with Total as operator. This project was obtained from the acquisition of Partex Holding B.V. (Partex) which was

completed on November 4, 2019. In 2019, the project had average sales volume for crude oil of approximately 11,000 BPD² and natural gas of 2 MMSCFD (approximately 370 BOED²).

(2.3) **Project Activity Highlights in the Middle East:** PTTEP's projects in this region are located in the Sultanate of Oman (Oman) and the United Arab Emirates (UAE).

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 Company holds 2% participating interest in this project, with Petroleum Development Oman (PDO) as operator (Operating Consortium). This project was obtained from the acquisition of Partex Holding B.V. (Partex) which was completed on November 4, 2019. The project had an average sales volume in 2019 for crude oil of approximately 618,000 BPD².

Mukhaizna (Block 53) Project

The Mukhaizna (Block 53) Project is a large producing onshore oil field located in southern Oman. The Company holds 1% participating interest in this project, with Occidental Petroleum as operator. This project was obtained from the acquisition of Partex Holding B.V. (Partex) which was completed on November 4, 2019. In 2019, the project had an average sales volume for crude oil of approximately 109,000 BPD².

Abu Dhabi Offshore 1 Project

The Abu Dhabi Offshore 1 Project is located in the offshore north-west of Abu Dhabi, the United Arab Emirates. On January 12, 2019, PTTEP MENA Limited, a wholly-owned subsidiary of PTTEP, and Eni Abu Dhabi B.V., a wholly-owned subsidiary of Eni were selected as the successful bidders from the Abu Dhabi's Open Block Licensing Round for exploration and production rights of Offshore 1 Block. The consortium had signed Concession Agreement with the Abu Dhabi National Oil Company (ADNOC) on January 12, 2019, with the participation interest for PTTEP MENA Limited at 30% and Eni Abu Dhabi B.V. (the Operator) at 70%.

Currently, the Project is in the evaluation process for petroleum potential for future exploration.

Abu Dhabi Offshore 2 Project

The Abu Dhabi Offshore 2 Project is located in the offshore north-west of Abu Dhabi, the United Arab Emirates. On January 12, 2019, PTTEP MENA Limited, a wholly-owned subsidiary of PTTEP, and Eni Abu Dhabi B.V., a wholly-owned subsidiary of Eni were selected as the successful bidders from the Abu Dhabi's Open Block Licensing Round for exploration and production rights of Offshore 2 Block. The consortium had signed Concession Agreement with the Abu Dhabi National Oil Company (ADNOC) on January 12, 2019, with the participation interest for PTTEP MENA Limited at 30% and Eni Abu Dhabi B.V. (the Operator) at 70%.

² The average sales volumes per day are calculated from the completion date of acquisition transaction.

Currently, the Project is in the evaluation process for petroleum potential to prepare for drilling of an exploration well in Q3/2020.

(2.4) **Project Activity Highlights in Africa:** PTTEP's projects in this region are located in the People's Democratic Republic of Algeria (Algeria), the Republic of Mozambique (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 Company holds a 35% interest in the project, with Groupement Bir Seba (Joint Operating Company) as the operator. The project had average production for crude oil in 2019 of approximately 18,000 BPD.

Algeria Hassi Bir Rekaiz Project

The Algeria Hassi Bir Rekaiz Project is located onshore in eastern Algeria. The Company holds a 24.5% interest and is the operator.

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. First oil production for the initial phase of 10,000-13,000 barrels per day (BPD) is expected in early 2021 with a plan for the second phase production capacity ramping up to around 50,000-60,000 BPD in 2025.

Mozambique Area 1 Project

The Mozambique Area 1 Project is a large natural gas project located offshore of Mozambique. The project is currently in development phase. The Company owns an 8.5% interest with TOTAL S.A. as the operator.

Key project highlights in 2019 is the FID announcement in June to develop the Golfinho-Atum field with the onshore LNG facility of the initial two liquefaction trains, a total nameplate capacity of 12.88 MTPA. The project has successfully secured the long-term LNG sales of 11.1 MTPA with key LNG buyers in both Asia and Europe.

In addition, the project had issued the Notice to Proceed (NTP) for both EPCI Offshore Installation and EPC Onshore Construction Contract. Currently, the contractor has entered the area and has started construction. The project is in the process of procuring LNG container ship. Presently, the project financing process is ongoing, with the plan for first cargo by 2024.

Block 17/06 Project

The Block 17/06 Project is located offshore west coast of Angola. The Company holds 2.5% interest in the project and is the operator. The project is currently evaluating field development plan for production. This project was obtained from the acquisition of Partex Holding B.V. (Partex) which was completed on November 4, 2019.

(2.5) **Project Activity Highlights in Australasia:** PTTEP has 1 project in this region which is located in the Commonwealth of Australia (Australia) comprising of 8 concession permits with the following as key highlights:

PTTEP Australasia Project

In 2009, the Company acquired 100% of the ordinary shares of Coogee Resources Limited, which was later renamed to PTTEP Australasia Pty Ltd. (PTTEP AA). PTTEP AA owns exploration fields located in the Timor Sea, in Australia and currently holds concessions to 8 permits with two key oil and gas fields, including Cash-Maple Field and Orchid Field (Block AC/P54). For the divestment of the Montara Field, the company sold a 100% stake in the field to Jadestone Energy (Eagle) Pty Ltd on September 28, 2018. The operatorship transfer was completed and approved by the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA).

Cash-Maple Field

The Company holds 100% interest in the Cash-Maple Field. In 2018, the field completed a Pre-FEED study and is in the process of studying the appropriate development plan.

Orchid Field (AC/P54 Block)

The AC/P54 Block in Orchid Field had completed drilling of an exploration well in 2019 with successful results. The well encountered gas and condensate with net pay thickness of around 34 meters. The project is planned to include its development along with the Cash Maple Field.

(2.6) **Project Activity Highlights in North and South America:** PTTEP's projects in this region are located in Canada, the Federative Republic of Brazil (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 Company holds 100% participating interest and is the operator of the Thornbury, Hangingstone, and South Leismer fields. The project is currently under evaluation for an appropriate development plan.

Potiguar Project

The Potiguar Project is a producing oil field located onshore northeast of Brazil. The Company holds 50% participating interest and is the operator. This project was obtained from the acquisition of Partex Holding B.V. (Partex) which was completed on November 4, 2019. The project had average sales volume for crude oil in 2019 of approximately 240 BPD³.

Barreirinhas AP1 Project

The Barreirinhas AP1 Project is located in the Barreirinhas Basin, offshore to the east of Brazil. The Company holds participating interest of 25% in the project, with Shell Brasil Petroleo Ltda. as the operator. The project comprises of 4 exploration blocks: BAR-M-215, BAR-M-217, BAR-M-252 and BAR-M-254. The project is currently evaluating the petroleum potential.

³ The average sales volumes per day are calculated from the completion date of acquisition transaction.

The 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 Company holds 20% stake in the project, with Petrobras as the operator. The project is currently evaluating the petroleum potential.

The Mexico block 12 (2.4) Project

The Mexico block 12 (2.4) Project is located in the Mexican Ridges, western Gulf of Mexico. The Company holds 20% participating interest in the project, with Petronas as the operator. In 2019, the project received an exploration plan approval from the National Hydrocarbons Commission (CNH) in Mexico, with the exploration period as stated in the agreement starting from June 2020. The project is currently evaluating petroleum potential for further commencement according to the approved exploration plan.

The Mexico block 29 (2.4) Project

The Mexico block 29 (2.4) Project is located in the Campeche, southern Gulf of Mexico. The Company holds 16.67% participating interest in the project, with Repsol Exploración México, S.A. de C.V. as the operator. In 2019, the project received an exploration plan approval from the Comisión Nacional de Hidrocarburos (CNH) in Mexico, with the exploration period as stated in the agreement starting from June 2019. The project is currently evaluating petroleum potential for further commencement according to the approved exploration plan and is in process of preparation for 2 exploration wells to be drilled in Q2/2020.

1.4.2 Operational Policy of PTTEP Group

PTTEP has continuously expanded our E&P business, including in related businesses, 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 is overseen by the Company. The boards of directors of the subsidiaries, especially the E&P related business e.g. ARV, have the business management decision authority to 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.

1.5 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 a fully integrated petroleum and petrochemical business by strategically investing directly and indirectly through its group of companies, both in the upstream and downstream businesses.

Currently, PTT holds 65.29% of PTTEP's registered and paid-up capital, 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 2019, 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" section.

2. Nature of Business Operation

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 2017 – 2019 are 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 at December 31, 2019 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 Project, Oman-PDO (Block 6), Oman-Mukhaizan (Block 53), Kazakhstan-Dunga and Brazil-Potiguar 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 2017-2019

Product	Operated by	% of shares held by the Company	2017		2018		2019	
			Revenue (Million USD)	%	Revenue (Million USD)	%	Revenue (Million USD)	%
Sales								
Crude oil	PTTEP	-	137.42	3.03	186.21	3.41	186.00	2.89
	PTTEPI	100	45.38	1.00	53.74	0.98	57.99	0.90
	PTTEPS	100	346.92	7.65	469.42	8.59	493.93	7.69
	Orange	53.9496	87.08	1.92	81.38	1.49	84.97	1.32
	B8/32 Partners	25.0009	36.84	0.81	36.49	0.67	39.38	0.61
	PTTEP HV	100	20.49	0.45	26.07	0.48	26.73	0.42
	PTTEP AP	100	220.59	4.87	143.80	2.63	-	-
	PTTEP HL	100	113.58	2.51	123.07	2.25	107.84	1.68
	Natuna 2	50	2.80	0.06	2.32	0.04	2.73	0.04
	PTTEP AG	100	53.58	1.18	55.93	1.02	66.79	1.04
	PTTEP SBO	100	-	-	-	-	163.24	2.54
	PTTEP SKO	100	-	-	-	-	114.90	1.79
	POC	100	-	-	-	-	47.28	0.73
	PKC	100	-	-	-	-	5.67	0.09
	PBL	100	-	-	-	-	0.40	0.01
Natural gas	PTTEP	-	1,492.21	32.92	1,869.72	34.20	2,332.17	36.30
	PTTEPI	100	789.76	17.42	907.14	16.59	1,038.44	16.16
	PTTEPS	100	42.44	0.94	42.79	0.78	41.22	0.64
	Orange	53.9496	23.95	0.53	20.70	0.38	21.38	0.33
	B8/32 Partners	25.0009	10.09	0.22	9.59	0.18	9.91	0.15
	PTTEP HV	100	1.51	0.03	1.61	0.03	1.82	0.03
	PTTEP HL	100	0.32	0.01	0.91	0.02	1.16	0.02
	Natuna 2	50	61.35	1.35	75.60	1.38	64.26	1.00

Product	Operated by	% of shares held by the Company	2017		2018		2019	
			Revenue (Million USD)	%	Revenue (Million USD)	%	Revenue (Million USD)	%
Natural gas	PTTEP SP	100	139.11	3.07	161.07	2.95	183.30	2.85
	PTTEP SBO	100	-	-	-	-	0.05	0.00
	PTTEP SKO	100	-	-	-	-	72.07	1.12
	PKC	100	-	-	-	-	0.001	0.00
LPG	PTTEP	-	9.04	0.20	7.94	0.14	8.12	0.13
	PTTEPS	100	27.14	0.60	23.82	0.44	24.37	0.38
	PGC	100	-	-	-	-	8.75	0.14
Condensate	PTTEP	-	522.10	11.52	768.63	14.06	712.95	11.10
	PTTEPI	100	49.70	1.10	66.70	1.22	60.19	0.94
	PTTEPS	100	0.76	0.02	0.94	0.02	0.89	0.01
	PTTEP SP	100	47.04	1.04	67.22	1.23	59.61	0.93
	PTTEP SKO	100	-	-	-	-	5.10	0.08
Naphtha	PGC	100	-	-	-	-	2.81	0.04
Total sales			4,281.20	94.44	5,202.81	95.17	6,046.42	94.10
<u>Revenue from pipeline transportation</u>								
Pipeline transportation	MGTC	25.5	36.20	0.80	61.93	1.14	67.59	1.05
	TPC	19.3178	9.35	0.21	7.23	0.13	5.29	0.08
	ATL	80	32.26	0.71	38.40	0.70	43.52	0.68
Total revenue from pipeline transportation			77.81	1.72	107.56	1.97	116.40	1.81
<u>Other income</u>								
Gain on foreign exchange			51.40	1.13	-	-	108.60	1.69
Interest income			59.58	1.31	83.35	1.52	86.23	1.34
Gain on financial derivatives			-	-	13.97	0.26	-	-
Other income			53.27	1.18	50.79	0.93	55.39	0.87
Total other income			164.25	3.62	148.11	2.71	250.22	3.90
Total revenues			4,523.26	99.78	5,458.48	99.85	6,413.04	99.81
Share of gain of associates and joint ventures			9.75	0.22	7.93	0.15	12.35	0.19
Grand total after inclusion of share of gain of associates and joint ventures			4,533.01	100.00	5,466.41	100.00	6,425.39	100.00

For 2019, total revenues for PTTEP and its subsidiaries was 6,425 MMUSD (equivalent to 199,202 MMTHB), an increase of 959 MMUSD or 18% when compared with the revenues in 2018 which was 5,466 MMUSD (equivalent to 176,943 MMTHB). The increase was primarily due to an increase in sales revenue of 843 MMUSD from an increase in natural gas and crude sales revenue. The increase was primarily from Bongkot Project due to the additional acquisition of participating interest, the acquisition of Murphy's business in Malaysia and Partex Holding B.V. including an increase in the average selling price.

2.2 Products and Services

2.2.1 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 which is liquid in nature and obtained from oil wells and gas 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.

Liquefied Petroleum Gas (LPG) is obtained from crude oil refinery or natural gas separation process, primarily consisting of butane and propane.

Crude oil, condensate, and LPG are measured in barrel, while natural gas is measured in cubic foot at the standard conditions (One atmosphere or atm at 60 degree 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.

2.2.2 Midstream

2.2.2.1 PTT Global LNG Company Limited (PTTGL)

PTTEP and PTT have jointly established PTT GL on June 23, 2017 pursuant to the resolution of PTTEP's Board of Directors No. 1/2560/419 on January 26, 2017 and No. 7/2560/425 on May 25, 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.

As of December 31, 2019, PTT GL had one investment project, a 10% share in PETRONAS LNG 9 Sdn Bhd (a subsidiary of PETRONAS). PTTGL operates an LNG liquefaction plant in Malaysia with 3.6 million tons per annum (31.2 million barrels of oil equivalent) capacity.

2.2.2.2 Oman LNG Project (OLNG)

Partex possesses a 2.0% stake in Oman LNG LLC (OLNG) which owns two 3.4 million tons per annum capacity in liquefaction trains near Sur, Oman. OLNG operates its own trains and a third liquefaction train at the same facility with a capacity of 3.6 million tons per annum, owned through a separate company called Qalhat LNG (QLNG). The three trains have a combined nameplate capacity of 10.4 million tons per annum.

OLNG owns 36.8% of QLNG and Partex is therefore, indirectly, also a shareholder of QLNG (0.736%). The LNG produced is sold largely to South Korea and Japan through existing long-term contracts (SPAs), with the concession due to expire by the end of 2024, in accordance with the SPA. 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%), Korea Gas Corporation (“KOGAS”) (1.2%), Samsung (1.0%), Hyundai (1.0%), Daewoo International (1.0%), Itochu (0.9%) and SK Innovation (0.8%), while in QLNG the partners are the Government of Oman (46.8%), Mitsubishi Corporation (3.0%), Gas Natural Fenosa (7.4%), Itochu (3.0%) and Osaka Gas (3.0%).

2.2.2.3 ADNOC Gas Processing (AGP)

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

AGP Joint Venture processes Feed-gas from the associated gas supplied from ADNOC Onshore’s oil fields 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, with the concession due to expire by the end of 2028, in accordance with the SPA.

Partex possesses a 2.0% stake in the AGP Joint Venture, with ADNOC owning a 68% stake and Shell and Total each holding 15%. AGP has a strategic role in ADNOC and the UAE as it yields substantial revenues from exports and is key for domestic electricity generation. Partex had preserved its long standing relations with ADNOC, having been a partner in the gas processing facilities since its inception in 1978.

2.2.3 Gas Transportation Pipeline

PTTEP Offshore Investment Company Limited (PTTEPO), a wholly-owned subsidiary of PTTEP, has major investments in other companies, such as a 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 connected at the border between the Republic of the Union of Myanmar and Thailand.

2.2.4 Jetty and Warehouse

The Petroleum Development Support Base was established to provide jetty and warehouse services to support 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, B6/27 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, KrisEnergy G10 (Thailand) Ltd., and Mubadala Petroleum (Thailand) Limited. Moreover, the Support Base can also support affiliated offshore operating projects, such as Myanmar M3 Project, Myanmar M11 Project, and Zawtika Project which are located in the Republic of the Union of Myanmar. Currently, our Support Base operates at two 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 Facilities 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 58-rai warehousing service facility is divided into four sections, namely the storage warehouse; open yard; free-zone storage warehouse; and free-zone yard for optimal storage and maintenance purposes 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, though 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 two supply vessels 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 four sections, namely the storage warehouse; open yard; free-zone storage warehouse; and free-zone yard for optimal storage and maintenance purposes 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 Control Program (OHSAS 18001 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.

2.2.5 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, 2016 onwards.

2.2.6 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.

2.2.7 Manpower Services

PTTEP Services was established in accordance with the resolution of PTTEP Board Meeting No. 12/2546/216. With its primary business objective to supply manpower to support 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, and technicians, 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 its 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, it has provided basic training, including English and computer courses, to help the staff perform their jobs effectively.

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

2.2.8 AI and Robotics

AI and Robotics Ventures Company Limited (ARV) was incorporated on September 21, 2018, as a wholly-owned entity of EP-Tech Ventures Holding Company Limited, a subsidiary of PTTEP. ARV's strategic direction is to become a platform of choice which delivers cutting-edge AI and robotics solutions. In order to achieve its commitment to delivering best-in-class performance and maintaining competitiveness, ARV focuses on three key pillars: 1) research and development, and integration of cutting-edge AI and robotics technological capabilities across multiple industry verticals, 2) comprehensive and efficient data-driven AI, yielding robotics solutions to business challenges, and 3) a unique business platform to enable sustainable growth through open-innovation and symbiotic partnerships. Its products and services simultaneously respond to an increasing demand of both energy and other industries, including agriculture, security, and environmental conservation, all of which are the key drivers for Thailand and Southeast Asian economies.

2.3 Permission to Operate, Concession or Business Promotion

PTTEP operates a 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 Production Sharing Contract, Concession, or 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 the concession regime, production sharing contract regime and services agreement regime. Key points in the petroleum business are as follows:

2.3.1 Demarcation of Petroleum Exploration and Production Areas

The Department of Mineral Fuels, Ministry of Energy, as the government authority under the petroleum law, is responsible for demarcating each petroleum exploration and production areas (Block) and inviting oil companies to submit their applications requesting awarding concessions, production sharing contracts or services agreements. In considering any awards, the Petroleum Committee has a duty to render advice to the Minister. The Minister with the approval of the Cabinet has the authority to sign a concession, production sharing contract or services agreement to award the right to explore, exploit and produce petroleum. The qualifications of each applicant will be considered by the State to award the right to explore, exploit and produce petroleum, which includes investment funds to be brought in and used in the exploration activities, transfer of knowledge and technology, employment of Thai nationals, and the utmost benefits of the State.

2.3.2 Characteristic 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, 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 programs and budgets. The operator will issue a cash call to all parties to finance the project. Generally, whether an oil company will become a project operator depends on its investment conditions, readiness, and business strategy in that particular project.

2.3.3 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 successful exploration as well as other investment risk factors. A thorough study on 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 taken into account. Assuming that the project is commercially feasible, the company will apply for the 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 the right to explore, exploit and produce petroleum, an exploration program will be conducted, normally taking 2-3 years. If 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, this means that the petroleum field is considered to have commercial viability; further investment onto development phase is therefore justified. The operator shall then apply for an 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, and a long-term sales agreement for the petroleum to be produced should 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 is made at the wellhead, while sales of natural gas from foreign areas is made at the Thai borders. PTT is currently responsible for installation of most of the gas pipelines for the production amount as specified in the gas sales agreement. Sales of crude oil is made at the buyer’s refinery, while sales of condensate is made at the Floating Storage Unit (FSU) near the wellhead.

2.3.4 Description of Laws Relating to the Business

Operation of the 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 with prior notice of not less than six months. The royalty can be used as 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 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 since 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 remunerator benefits which may be taken as deduction
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 five exploration blocks	not exceeding 10,000 sq.km. per exploration block, up to five exploration blocks	not exceeding 4,000 sq.km. per exploration block, up to five exploration blocks ³

(2) Production Sharing Contract

(2.1) All petroleum operation expenditure shall be responsible by the contractor whereas the contractor shall recover 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 with 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 an exploration and production contract, the hiring for an exploration contract or the hiring for a production contract.

(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.

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

2.4 Market and Competition

PTTEP has invested in both domestic and overseas projects, including the Republic of Indonesia, the Republic of the Union of Myanmar, the Socialist Republic of Vietnam, Malaysia, the Commonwealth of Australia, Canada, the United Mexican States, the People's Democratic Republic of Algeria, the Republic of Mozambique, the Federative Republic of Brazil, the Republic of Kazakhstan, the Republic of Angola, the United Arab Emirates, and the Sultanate of 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 2019, total sales by the Company and our subsidiaries averaged 350,651 barrels of oil equivalent per day (BOED). The total sales ratio of natural gas to liquid was 71% : 29% by volume and 63% : 37% by revenue, as shown below.

Product	Sales Volume	Value (million USD)
Natural Gas	560,849 MMSCF or 90.72 MMBOE	3,765.78
Condensate	14.05 MMBBL	838.74
Naphtha	25,375 metric tons or 0.29 MMBOE	11.55
Crude Oil	22.32 MMBBL	1,397.39
LPG	72,980 metric tons or 0.60 MMBOE	32.49

2.4.1 Marketing Characteristics

PTTEP sells our outputs from domestic and regional projects (i.e. the Republic of the Union of 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.

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 a long-term contract, 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 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 an 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 short-term contract which selling price refer 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 the Republic of the Union of Myanmar: Approximately 80% of the produced natural gas from Zawtika and Yadana projects is primarily sold to Thailand through PTT, while the remaining 20% is sold to the Republic of the Union of Myanmar for its domestic power generation. Nearly all of the condensate from Yetagun Project in 2019 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 the Socialist Republic of Vietnam: All of the oil output produced from Vietnam 9-2 Project is sold to Binh Son Refining and Petrochemical Company Limited (BSR), a refinery in the Socialist Republic of Vietnam, for the consumption in the Socialist Republic of Vietnam. The produced crude from Vietnam 16-1 Project is sold in the regional spot markets through auction, while the produced gas from both projects is sold to Vietnam Oil and Gas Group, a state enterprise, for the consumption in the Socialist Republic of Vietnam.
- Algeria 433a & 416b Project in the People's Democratic Republic of Algeria: The Bir Seba Field has been commenced the production with its first commercial sales of crude oil since December 2015. The crude oil is sold and marketed by PTT as the marketing agent in the spot markets.
- Potiguar Project in Brazil: A producing oil field in Brazil with production volume in 2019 around 300 barrel per day. The crude oil is sold under short-term contract to domestic refinery.

- Dunga Project in the Republic of Kazakhstan: A producing oil field located onshore west of the Republic of Kazakhstan, operated and sold by Total. The crude oil is sold under short-term contract to both domestic and export market.
- Block K Project and the Sarawak SK309 and SK311 Project in Malaysia: Crude oil and condensate from SK309 and SK311 projects, together with crude oil produced from Kikeh, Siakap North-Petai (SNP) and Gumusut-Kakap (GK) from Block K project are sold under short-term contract and spot markets. Natural gas produced from the SK309 and SK311 project is sold under long-term contract to Petroliam 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 Petroliam Nasional Berhad (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.

2.4.2 Competition

Thailand's E&P industry is an 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 contract coupled with take-or-pay clauses however have continued to attract new investments to the market.

Regarding the approximate domestic production in 2019, PTTEP's petroleum production accounts for 37% of the total domestic production in 2019, making the Company the leader among the domestic producers, detailed as follows:

Producers	% Domestic Production Volume
PTTEP	37
Chevron	28
MOECO	9
PETRONAS	9
Total	7
Others	10

Source: Department of Mineral Fuels, Ministry of Energy (as of December 2019)

Currently, the shale gas revolution is driving a dramatic restructuring of the global natural gas markets. It creates new opportunities and incentives for lower-cost natural gas to higher-value global markets via LNG exports. The global LNG demand growth is therefore expected to be stronger, resulting in an increase of its market share in the future.

2.5 Production

2.5.1 Exploration and Production Stages and Technology

Petroleum exploration and production can generally be divided into four 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 with additional study to increase the certainty of estimating size and properties of the reservoirs. The main activities conducted in this stage include:

- Detailed study of petroleum geology and additional seismic survey
- 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

(4) Production stage: This is the stage where petroleum and associated products are flowed 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 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.

2.5.2 Petroleum Reserves

Petroleum reserves can be divided into two 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 which 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 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 have 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, 2019, the total amount of Proved Reserves of PTTEP Group's projects¹ was 310 million stock-tank barrels (MMSTB) of crude oil and condensate², and 5,097 billion standard cubic feet (BSCF) of natural gas or 830 million barrels of oil equivalent (MMBOE). The total amount of Proved Reserves in terms of oil equivalent was therefore 1,140 MMBOE. Details of the Company's Proved Reserves are shown in the following table:

¹ Include APICO Joint Venture project

² Include LPG

PTT Exploration and Production Public Company Limited
 Crude and Condensate and Natural Gas Proved Reserves ⁽¹⁾
 As of December 31, 2019

	Crude and Condensate ⁽²⁾			Natural Gas			Barrel of Oil Equivalent		
	(Million Barrels)			(Billion Cubic Feet)			(Million Barrels)		
	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, 2018	116	48	164	2,181	1,105	3,286	470	207	677
1) Revision of previous estimates	13	(1)	12	160	(53)	107	41	(4)	37
2) Improved recovery	1	0	1	1	1	2	2	1	3
3) Extensions and discoveries	2	45	47	21	954	975	5	207	212
4) Purchases/Sales of petroleum in place	21	106	127	816	582	1,398	153	206	359
5) Production	(30)	(11)	(41)	(475)	(212)	(687)	(107)	(43)	(150)
Proved Reserves as of Dec 31, 2019	123	187	310	2,704	2,377	5,081	564	574	1,138
<i>Company's share of reserves of equity companies ⁽³⁾</i>									
Proved Reserves as of Dec 31, 2019	0	-	0	16	-	16	2	-	2
Total Proved Reserves as of Dec 31, 2019	123	187	310	2,720	2,377	5,097	566	574	1,140

(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) LPG included

(3) Included Reserves from APICO Joint Venture project

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.

2.5.3 PTTEP Petroleum Production

In 2019, the total production of PTTEP Group¹ was 151 MMBOE, consisting of 41 MMSTB of crude oil and condensate² and 690 BSCF or 110 MMBOE of natural gas. This was equivalent to a production rate of approximately 413,640 barrels of oil equivalent per day (BOED) which was approximately 54,255 BOED or 15.1% increase from the previous year. The increase was mainly due to the acquisition of Murphy Oil Corporation in Malaysia and Partex Holding B.V.

2.5.4 Environmental Impact Management

PTTEP emphasizes systematic management of environmental stewardship in our organization. It is to manage the resources & environment and concurrently develop the organization as well as focus on pollution prevention and environmental protection. With this management, it helps us reduce impacts on the environment, create value for the Company, stakeholders and the environment.

Hence, PTTEP conducts an environmental impact assessment study prior to commencing new exploration and production projects. It is legally required to ensure that environmental mitigation measures and monitoring programs have been put in place to minimize environmental impacts arising from operations for both domestic and international projects. Mitigation and monitoring of the above environmental programs are controlled and regulated by local government agencies. In Thailand, there are two main agencies, namely, the Department of Mineral Fuels (DMF) of the Ministry of Energy, which plays a major role in regulating the activities of exploration and production companies, and the Office of Natural Resources and Environmental Policy and Planning (ONEP) of the Ministry of Natural Resources and Environment, which issues directives and approvals of environmental impact assessments study reports prior to the commencement of exploration, drilling, and production projects. PTTEP also submits the environmental compliance and monitoring reports to both main agencies to assure our environmental performance and compliance with the approved mitigation measures and monitoring programs.

To ensure that the environmental impacts from our operations have been minimized, we have introduced and implemented the following environmental policies and targets:

¹ Include APICO Joint Venture project

² Include LPG

- Targeting greenhouse gas emission (GHG) intensity reduction by at least 25% by 2030 from base year 2012 covering all operations in both Thailand and international projects including Petroleum Development Support Base and implementing the projects and technologies for GHG emission reduction.
- Targeting zero oil and chemical spill.
- Targeting no net loss for biodiversity in IUCN protected area and no operations in World Heritage sites.
- Avoiding operations in areas at risk from water scarcity and ensuring no impact on water users and communities.
- Re-injecting produced water to reservoirs.
- Targeting zero hazardous waste to landfill by 2020.

Details of the Company's performance against the targets above are disclosed in the 2019 Sustainability Report.

2.5.5 Performance over the Past Three Years

During 2017 - 2019, PTTEP has strictly complied with both Thai and international legislation, and other regulations and requirements concerning the area of Safety, Security, Health and Environment (SSHE). The achievements of our environmental performance are represented by the following national and international, awards and recognition:

(1) PTTEP has achieved a member status of the Dow Jones Sustainability Indices (DJSI) World in Oil and Gas Upstream & Integrated Industry for the sixth consecutive year (2014 – 2019). The Company is also named the Industry Leader in this category for the second time since the first one, received in 2016. The worldwide recognition as the Industry Leader was derived from higher best-in-class ratings and top scores (100/100) ratings PTTEP received in multiple categories.

(2) PTTEP was listed in the 2019 Thailand Sustainability Investment (THSI) group from The Stock Exchange of Thailand for the fourth consecutive year as a listed company that has operated the business with sustainability with outstanding performance in the dimension of Environmental, Social, Economic and Good Governance performance.

(3) PTTEP's SSHE performance report as included in the Company's Sustainability Report has been assured by an independent third party and rated by the Global Report Initiative (GRI) for the seventh consecutive year.

(4) PTTEP continued implementing our Environmental Management System to comply with the revised edition of the ISO 14001 (ISO 14001:2015) international standard and certified by AJA Registrars Limited (which currently is SOCOTEC Certification (Thailand) Co., Ltd.) under the accreditation of the United Kingdom Accreditation Service (UKAS). By adopting the ISO 14001 "One Common System" for all certified sites, the Company has improved the efficiency of our environmental management system by continuously upgrading the environmental practices in maintaining, developing, and reducing environmental impacts in the following areas:

- Head Office
- Greater Bongkot North and Bongkot South fields of the Bongkot Project
- Arthit Project
- S1 Project
- PTTEP 1 Project and L53/43 & L54/43 Project
- Sinphuhorm Project
- PTTEP Petroleum Development Support Base (Songkhla and Ranong)
- PTTEP Core Research Center
- Block M9, Zawtika Operation Center at Dawei, Office at Yangon in the Republic of the Union of Myanmar

PTTEP was the first company in the E&P business in Thailand which earned certification of this standard.

(5) PTTEP continued to maintain the OHSAS 18001:2007 Occupational Health and Safety Standard, being certified by AJA Registrars Limited and accredited by ANSI-ASQ National Accreditation Board (ANAB) for our safety management system, which enables us to control occupational health and safety risks as well as to improve the performance. The projects which have received the certification and accreditation are S1, PTTEP 1, L53/43 & L54/43, Sinphuhorm, PTTEP Petroleum Development Support Base (Ranong), Arthit, and Bongkot (for both North & South fields). The Company also plans to expand coverage of the OHSAS to international assets.

(6) PTTEP submitted Safety, Security, Health and Environment performance reports to the Department of Mineral Fuels on a monthly and annual basis. These included the annual SSHE audits at operating sites by the Department of Mineral Fuels.

(7) PTTEP received the Green Meeting Certificates for PSB Songkhla (Plus Level) and PSB Ranong (Standard Level) from the Thailand Business Council for Sustainable Development (TBCSD). These awards recognize PTTEP as an outstanding corporation that organizes meetings in a way that maximizes the usage of resources and minimizes energy consumption as well as environment impacts.

(8) PTTEP received the 2019 Green Office award at the Excellence (G-Gold) Level from the Minister of the Ministry of Natural Resources and Environment. The event was held by the Department of Environmental Quality Promotion. PTTEP is the first company in the PTT Group and in the E&P sector that has received the highest award from this organization. In addition, the Company received the Green Procurement Certificate from the Thailand Environment Institute.

(9) PTTEP received a LESS (Low Emissions Support Scheme) Award Letter of Recognition from the Minister of Natural Resources and Environment. PTTEP received this award for the third consecutive years from The Thailand Greenhouse Gas Management Organisation (TGO), for its various Greenhouse Gas Reduction projects at the Head Office, Songkhla Petroleum Development Base and Ranong Petroleum Development Base. The total amount of greenhouse gas emissions reduced was 186,670 kilograms of carbon dioxide equivalent.

(10) PTTEP received a Thailand Energy Award 2019 in the category of energy conservation for transportation. This award underscores PTTEP's success in supply vessels logistics and transportation management which saved more than 13.6 million litres of diesel fuel consumption per year during 2016-2019. The awards ceremony was organized by the Department of Alternative Energy Development and Efficiency (DEDE), Ministry of Energy.

(11) PTTEP received a Best Practice Award in ISO 14001 & OHSAS 18001 presented by AJA Registrars Co., Ltd. and SOCOTEC Group. PTTEP is one of the 21 companies that were voted by AJA's Auditors and Management, out of more than 900 AJA certificate holders in Thailand.

(12) PTTEP was recognized as a constituent member of the FTSE4Good Index Series for the fourth consecutive year. FTSE Russell confirmed that PTTEP had been independently assessed according to the FTSE4Good criteria and satisfied the requirements to become a constituent member of the FTSE4Good Index Series. Created by the global index provider FTSE Russell, the FTSE4Good Index Series is 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 the Energy sector.

(13) PTTEP in cooperation with PTT Group is in the process of developing the PTT Group Oil Spill Response Plan and Oil Spill Remediation Guidelines. With this cooperation, the Oil Spill Response of PTT Group has been prepared to be aligned with the National Oil Spill Response Plan of the Marine Department. This is to prepare an effective emergency response that mitigated the potential consequences of a spill incident to people, the environment, company assets and reputation and enables normal operations to be resumed efficiently.

In terms of our environmental management and stewardship, the spill rate is also set up as one indicator for monitoring the effectiveness of our performance management. During 2017 - 2019, the spills accounted for 0.26, 0.60 and 0.64 tonnes per million tonnes of production, respectively. Details of spill incidents and mitigation actions are disclosed in the 2019 Sustainability Report.

2.5.6 Environmental Disputes or Lawsuits and Approach to Resolution

Details are disclosed in the "Legal Dispute" section.

2.5.7 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 2019, PTTEP's SSHE strategy was mainly focused on improving 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 awareness of our line management with regard to their roles and responsibilities. Furthermore, we will be promoting SSHE leadership awareness among our employees and contractors at all levels. Importantly, PTTEP is still dedicated to carry 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 2019, PTTEP's SSHE Key Performance Indicators of Lost Time Injury Frequency Rate (LTIF), Total Recordable Injury (TRIR) and Spill rate were better than those of the previous year and in the top 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's emphasis and commitment to continuously improve SSHE implementation, so as to achieve our ultimate goal of being a "Target Zero" organization where employees and contractors can come to work and return home safely every day.

3. Risk Factors

Due to technical and operational complexities in the petroleum exploration and production business, together with the need for a high volume of investment for new investment opportunities, exploration activities, project development activities, as well as production activities, PTTEP, therefore, places great importance on risk management by setting up a carefully considered Risk Governance Framework. This framework defines roles and responsibilities for personnel working at each level of authority, ranging from the Board of Directors, the management to the business units/functions to ensure that all risks are addressed, monitored and reported with management that is systematic and efficient.

In 2019, to achieve company goal, PTTEP placed importance on strategic risk management by defining a Risk Appetite Statement for clearly strategic formulation and selection to align with PTTEP's "Energy Partner of Choice" vision and "Operates globally to provide reliable energy supply" mission. Moreover, we established significant strategic risk assumption regular monitoring to prevent and reduce corporate strategic risk to promptly adjust strategies in keeping with rapidly changing situations. In addition, PTTEP is also reshaping the organization to enhance our competitiveness in the E&P business, which is our core business, while searching for opportunities in related businesses to invest in the near future. Key risk factors associated with our core business can be summarized as follows.

3.1 Strategic & Portfolio Risks

3.1.1 New Investment Risks

PTTEP continues to focus on E&P opportunities in Southeast Asia, particularly Malaysia, Myanmar and Sirikit Oil Field (S1 Project) in Thailand, that align with "Coming Home" company strategy, which is the area that the Company is familiar with. Moreover, PTTEP also seeks business opportunities in prolific petroleum areas with acceptable geopolitical risks and low costs of development and production. Certain risks and uncertainties must also be considered. These include political stability, energy policy changes, including laws and regulations.

The Company has drawn up plans to mitigate those risks which may potential affect our operations and investment growth, such as adopting strict due diligence within company investment risk limit including consideration of counterparty risks, recruiting proficient consultants, promoting understanding among stakeholders, proactively pursuing effective public relations, monitoring and providing opinions for appropriate decommissioning of equipment in areas related to technical aspects, regulatory requirements, economic feasibility as well as environmental and social impacts. In addition, we also regularly assess and analyze risks associated with climate change in relation to the business, as well as 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.

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 volumes, 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. 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 policy and that each project is economically and technologically feasible, and whether conventional or unconventional resources are involved, before proposing it to the Risk Management Committee prior to the final approval of the Board of Directors.

3.1.2 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 inefficiency. In this regard, PTTEP has taken the following actions to enhance our business processes and organizational capability.

(1) Developing knowledge management is the company strategy's tool to collect, share and apply the valued knowledge to our operation that supports company sustainable growth and improve our staff competency to prepare the readiness to expand into new business opportunities. 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, new technologies and capability of the Company's research and development program are developed in line with our growth strategy to expand into new business opportunities. Our Capability and Technology Development Roadmap has been developed along with continuous research on technology to support business growth.

(2) Systems, procedures, and the organizational structure are improved and developed in line with PTTEP's growth strategy and business plan. These include work process improvement towards a matrix organization to maximize work efficiency, development of the Delegation of Authority and Signatures (DAS), as well as enhancement of the IT Global Platform, system stability and confidentiality control, e.g., adoption of cloud storage. In addition, the Company 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 development of technology capability for our staff, such as Data Scientists and Data Engineers.

(3) 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 in operating and targeted countries. The plans focus on developing their capabilities and leadership, recruiting of external personnel in key positions that do not yet have in-house personnel, together with enhancing our employee engagement by targeting the Company to be ranked in Thailand's Top Quartile level in 2020. In addition, human resource improvement and our values and culture cultivation also ensure that development and growth of the Company are in line with PTT Group's goals.

3.2 Financial & Marketing Risks

3.2.1 Financial Risks

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

Major financial risks consist of counterparty risk and liquidity risks. For counterparty risk, it is 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 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, PTTEP Group has a policy to manage such risks by preparing appropriate cashflow forecasts and maintaining both committed and uncommitted credit facilities with financial institutions to support its working capital requirements.

3.2.2 Marketing and Distribution Risks

PTTEP has entered long-term gas sales agreements (GSAs) with PTT, which is the Company's major domestic buyer. The terms of the GSAs generally last 15 - 30 years. 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).

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 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.

3.2.3 Petroleum and Oil Price Risks

PTTEP Group's product prices depend on the world's crude oil prices, which are subject to multiple factors beyond our control, for example, the economic, political, and geopolitical stability of various countries (e.g., countries affected by sanctions from the United States of America), OPEC's production policy, capability and production plans of major oil producing countries (e.g., the United States of America, Russia), oil reserves in each country, and global climate change.

Fluctuations in the world's oil prices immediately affect the prices of PTTEP Group's crude oil and condensate. Yet, while natural gas prices tend to follow oil prices, most of 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 rising oil prices, 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.

3.2.4 Exchange Rate Risks

PTTEP Group adopts the U.S. Dollar (USD) as its functional currency in accordance with the International Financial Reporting Standards (IFRS) since the USD is the main currency used for trading PTTEP Group's major petroleum products, such as crude oil and natural gas. 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 PTTEP Group's trade customers are Thai entities; hence, revenue from USD-linked petroleum product 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, 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, 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, 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.

3.2.5 Interest Rate Risks

PTTEP Group is exposed to interest rate risk as the risk affects future cash flows and fair values of the financial instruments employed. 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 interest rate swaps. 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.

3.3 Political and Legal/Regulatory Risks

3.3.1 Political Risks in Investment Countries

Based on PTTEP's foreign investment policy, we aim to invest in target 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 acceptable risks in terms of politics, the economy, investment, laws and regulations but we also appoint a geopolitical risk team to closely follow the situations in countries and territories where PTTEP operates from internal sources. The team periodically produces analytical monthly reports on the developments 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 are situated remotely and have not experienced any negative impacts at all.

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 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.

3.3.2 Compliance Risks

Generally, these risks can result from a variety of factors, such as 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 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 PTTEP Group's reputation. To minimize these risks, the Governance, Compliance, and Internal Control Department is responsible for assuring that all of the business units 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. In addition, PTTEP regularly monitors the legislation process to ensure that PTTEP's businesses comply with emerging laws.

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

In 2019, PTTEP monitored details of a new law, i.e. data privacy and cyber security, and communicated including arrangement of training sessions for related staff. Moreover, the Company developed another plan to ensure company compliance with related laws.

3.4 Operational Risks

3.4.1 Exploration Risks

Exploration activities are essential for the E&P business as they ensure that additional new petroleum reserves are found to replace those which have gone to production to generate the revenues, as well as to add new reserves to align with our strategy and support future production targets and growth.

The objective of exploration is to search for sizable petroleum resources for commercial development. The risks associated with exploration activities are geological risks and the uncertainty of finding a petroleum field of commercial size (Resources Volume Uncertainty).

Managing key exploration risks thus depends on the selection of exploration sites with good chances of finding sizable petroleum reserves that allow for commercial operations within an appropriate time and cost. The key factors that are

used to consider whether to invest in petroleum exploration include chance of success, resource estimation, exploration period and planned expenditures, thoroughness of geological studies, seismic acquisition and interpretation, exploration economic evaluation, and the terms of contracts.

PTTEP establishes clear processes and criteria in evaluating each step of the project, 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 strategic plan based on exploration portfolio management, while allocating exploration budgets to high-potential blocks for further exploration activities. This process is reviewed and revised annually to ensure that the exploration strategies reflect and remain in line with the outcomes of the overall exploration activities and the agreement with the corporative targets.

In addition, the Company also stipulates that exploration studies need to pass the evaluation by the petroleum potential assessment review team to ensure that processes and results of various exploration project studies have covered the key issues. The assessment must also remain in line with certain criteria and standards as well as PTTEP's practices to ensure investment confidence and that the results of the exploration are in accordance with PTTEP's goals.

To align with company strategy, PTTEP define a policy to diversify exploration investment by setting the investment proportion in each site and diversifying it to another with partners who have site experience to extend the Company's exploration concept that support opportunity of achievement.

3.4.2 Project Development Risks

Following oil price fluctuations, PTTEP has continued to review the Company's development as well as cost control plans to meet targets. Development projects are part of the preparation for increasing reserves and production in the near future, such as those in the Mozambique Rovuma Offshore Area 1 Project and Algeria Hassi Bir Rekaiz Project. Meanwhile, for new projects with potential delays and cost overruns, the Company has implemented the following risk mitigation measures to ensure that they all remain on schedule.

(1) Project management: To safeguard against project delays and cost overruns, the Company focuses on related policy formulation, project management organization, project planning and engineering system designs, contract management, procurement, and construction monitoring.

(2) Personnel and process: To meet the targets set for safety, quality, budget, and timeline for project completion, the Company focuses on development of the team's skills which help us to better prepare for and protect ourselves when there is increased competition in the employment market for those with extensive skills and experience in the field. Information and experience-sharing from previous projects are also encouraged as part of all our project team skill development, while the Company's Project Realization Process (PREP) continues to actively seek out new approaches to fine-tune the operations so that targets are realized.

(3) Commercial contracts: To ensure maximum efficiency in minimizing the risks associated with non-contractual compliance and disputes while working with our contractors, the Company focuses on contract drafting, 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 pertaining to 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.

3.4.3 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, and poor product quality, 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, 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 Asset Reliability & Integrity Management System (ARIMS) 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.

The Company has also received ISO 22301 Business Continuity Management System (BCM) certification. The certified sites include Zawtika M-9 Production Operations and Business Support (Myanmar), Petroleum Development Support Base (Songkhla), and PTTEP Headquarters. BCM provides a formal plan that will keep effective and prompt business operation during disruptive period to provide confidence to for PTTEP's customers and stakeholders.

3.4.4 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 identification of internal and external factors. This helps to prevent major accidents as well as to reduce the risks that would affect PTTEP Group's employees and assets.

PTTEP has managed SSHE risks through the Company's SSHE Management System to set 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 safety and risk management to improve knowledge and performance as well as to keep the risks to the level 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, audit findings, close-out status, natural disasters, security status, and health infection in high risk countries, to ensure that all situations are being monitored to determine the suitable mitigation plans for improvement, correction, and prevention towards achieving even higher social and business sustainability.

3.4.5 Digital Security Threat Risks

Cybercrime frequently occurs and spreads across multiple business sectors through various channels, such as software vulnerability attacks, ransomware, and malware which can potentially lead to business disruption. PTTEP recognizes the importance of safeguarding against digital security 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.

Measures include upgrading the IT systems and antiviruses to detect security threats, conducting penetration tests to find network weaknesses and those networks in need of improvement, raising IT security awareness and understanding among the Company's staff through IT security e-learning programs, establishing a Security Operation Center (SOC) responsible for IT network surveillance, 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.

In 2019, the Cybersecurity Act was announced in addition to the Computer Crime Act 2007 and 2017. In this Act, there are rules and duties for government agencies and the Critical Information Infrastructure (CII), where PTTEP is a government agency under this law and its systems may also be classified as CII. However, the formal list of CII has not yet been announced. The duties required by this law include the preparation of a Code of Cybersecurity practices, prevention, response, and mitigation risks of cyber threats, including notification of names and contact information of administrative and operational staff to coordinate cybersecurity and reporting when a significant cyber threat occurs to the organization's systems.

PTTEP currently references 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 by 2020. There has been ongoing investment in tools and services from PTT Digital to prevent and respond to the risk of cyber threats, such as the Security Operations Center (SOC), which is in the process of connecting Security Information and Event Management (SIEM) and the network firewall for all production sites, expected to be completed by Q2' 2020, including a cyber-threat response exercise every year (e.g., Penetration Testing, Vulnerability Assessment, Cybersecurity Drill). PTTEP is confident of the readiness to participate in the test and report significant cyber threats to government agencies as required by law.

Currently PTTEP has a Company order about the appointment of executive officers to coordinate with government agencies regarding the Computer Crime Act 2007 and 2017, and is currently considering the appointment and notification of the list of management and operational officers for public agencies and infrastructure agencies.

3.5 Emerging Risks

In response to climate change and advanced technology that have recently disrupted today's business operations, PTTEP intends to improve strategic risk management for more efficient and prompt adjustment of our operations to support our sustainable growth.

3.5.1 Climate Change Risks

In view of extreme weather events and natural disasters pose 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) Operation: cyclones, floods, or phenomena caused by higher global temperatures, which can lead to disrupted operation or serious damage to the Company's production platforms or make exploration areas/production sites inaccessible, (2) Regulatory: such as emission pricing, carbon tax, or more stringent enforcement of climate change legislation depending on countries in which we operate, and (3) Market: trend towards more environmentally friendly forms of energy usage. The universal trend is towards more environmentally friendly forms of energy usage. At the 2015 United Nations Climate Change Conference (COP21) held in Paris, France, in December 2015, 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. Thailand has also adopted a plan to reduce greenhouse gas emissions by 20 - 25% by 2030 (compared to the base year of 2015).

PTTEP realizes the significant of climate change management and managed to have the climate related risk management assessment for both existing projects and acquiring projects covering all those 3 aspects. PTTEP has established a risk management framework on climate change focusing on improving work processes to maximize energy efficiency, aiming for 5% reduction of energy intensity by 2020 and 25% reduction of greenhouse gas emissions by 2030 (compared to the base year of 2012). The Company has conducted reforestation activities to help increase the absorption of greenhouse gases as well as carbon offsetting through various mechanisms. Correspondingly, PTTEP has also engaged with the Thailand Greenhouse Gas Management Organization (TGO) to develop a set of activities, measures, and policies to reduce greenhouse gases under the Thailand Voluntary Emission Reduction (T-VER) project.

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 transition to a low-carbon society.

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

Technological advancement and 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), as well as other renewables and EV businesses whose production costs have plummeted over the 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 Paris Agreement on climate change as well as promotion of alternative-energy usage, such as the Alternative Energy Development Plan (AEDP) 2015 - 2036 that aims to increase the proportion of alternative-energy consumption in the forms of electricity, heat, or biofuel to 30% of the final stage of energy consumption in 2036, can cause tremendous damage to the energy industry. Oil demand has consequently been affected; some people may believe that days of the oil era are now numbered. This situation will be PTTEP's strategic risk that impacts our revenues from crude oil and condensate, which make up approximately 37% of the total revenues, including risk to our production cost advantages due to technology development by competitors.

In 2019, PTTEP modified business operations to align with advanced technology. The “ENTERPRISE” project will push the Company’s transformation, which involves the use of digital technologies and innovations as well as “Organizational Transformation” to remodel processes, allowing for more efficient and effective systems in order to become a lean organization with agile ways of working, resulting in reduced periods and costs of operation with lower uses of environmental resources together with environment preservation. The “ENTERPRISE” project also improves information management through digital transformation, e.g. establishing an integrated data platform, digitalization of 64 projects, and application of artificial intelligence (AI) or machine learning to assist production operation faster and more efficiently to increase our competitiveness and ready us for uncharted territory. For example, AI yields text analytics to analyze drilled wells in a shorter period that reduces costs and avoids inefficient production wells, AI is applied to set preventive maintenance plans to reduce the chance of equipment breakdown that impacts our revenue. The “ENTERPRISE” project assessment in five years will make up approximately five times the benefit of the investment thanks to reduced costs, increased revenue and improved operation efficiency, e.g. reduced development periods of production areas, early project development.

In addition, PTTEP has explored new business opportunities in order to enhance operational flexibility and competitiveness for sustainable growth by placing emphasis on three principal areas: (1) diversifying into other businesses in the oil and gas value chain, e.g., the “Gas to Power” project in Myanmar and Liquefied Natural Gas (LNG) (2) establishing a new subsidiary (AI and Robotics Ventures Co., Ltd.) in order to support future investments, such as being a service provider for activities using robotics and AI, predictive maintenance, and (3) renewable energies.

4. PTTEP and Our Subsidiaries' Assets

4.1 Property, Plant and Equipment

4.1.1 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 at December 31, 2019, PTTEP and our subsidiaries' oil and gas properties are represented as share of the joint ventures' individual assets for each project as follows:

<u>PTTEP's joint ventures</u>	<u>Company's interest (%)</u>
Bongkot	66.6667
Arthit	80
Contract 4 (B12/27)	45
Sinphuhorm (E5 North)	20
S1	25
Contract 3 (B10, B11, B12 and B13)	5
E5	20
Algeria Hassi Bir Rekaiz	24.5
<u>PTTEPI's joint ventures</u>	<u>Company's interest (%)</u>
Yadana	25.5
Yetagun	19.31784
PTTEP 1	100
G4/43	21.375
G9/43	100
L22/43	100
L53/43 & L54/43	100
G4/48	5
Bongkot (G12/48)	66.6667
Contract 4 (G7/50) ¹	60
Arthit (G8/50)	80

¹ On September 10, 2019, PTTEP International Limited (PTTEPI), received the official approval from the Director General of the Department of Mineral Fuels to receive the transfer of the 10% participating interests in concessions blocks no. G7/50 from PTTEP G7 Limited (PTTEP G7). As a result, PTTEPI's participating interests in the concessions blocks no. G7/50 increased from 45% to 60%. The transaction is a business combination under a common control.

Zawtika	80
Myanmar M3	80
Myanmar M11 ²	100
MTJDA	50
<u>PTTEPO's joint venture</u>	<u>Company's interest (%)</u>
B8/32 & 9A ³	25.001
<u>PTTEP SV's joint venture</u>	<u>Company's interest (%)</u>
Vietnam 52/97	7
<u>PTTEP KV's joint venture</u>	<u>Company's interest (%)</u>
Vietnam B & 48/95	8.5
<u>PTTEP HL's joint venture</u>	<u>Company's interest (%)</u>
Vietnam 16-1	28.5
<u>PTTEP HV's joint venture</u>	<u>Company's interest (%)</u>
Vietnam 9-2	25
<u>PTTEP AG's joint venture</u>	<u>Company's interest (%)</u>
Algeria 433 a & 416 b	35
<u>PTTEPS's joint venture</u>	<u>Company's interest (%)</u>
Sinphuhorm (EU-1)	20
B6/27	100
S1	75
<u>PTTEP SA's joint venture</u>	<u>Company's interest (%)</u>
Myanmar MD-7	50
Myanmar MOGE 3 ⁴	77.5
<u>PTTEP CA's joint venture</u>	<u>Company's interest (%)</u>
Mariana Oil Sands	100

² On September 26, 2019, PTTEP International Limited (PTTEPI) submitted a request to terminate and return 100% of the exploration blocks of Myanmar M11 project after fulfillment of the requirements of the Production Sharing Contract. The termination will be effective after receiving the official approval from the Government of the Republic of the Union of Myanmar.

³ PTTEP Offshore Investment Company Limited (PTTEPO) has shareholding in Orange Energy Limited and B8/32 Partners Limited, which hold the project's concession.

⁴ On February 28, 2019, PTTEP South Asia Limited (PTTEP SA) received the official approval from the Government of the Republic of the Union of Myanmar to receive 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.

<u>PTTEP AP's joint venture</u>	<u>Company's interest (%)</u>
PTTEP Australasia	
● AC/RL7, AC/RL12 and AC/P54	100
● AC/L3	100
● AC/RL10	90
● AC/RL4 (Tenacious)	100
● AC/RL6 (Audacious), AC/RL6 (exclusive of Audacious)	100
● AC/RL4 (exclusive of Tenacious), AC/RL5	100
<u>PTTEP MZA1's joint venture</u>	<u>Company's interest (%)</u>
Mozambique Area 1 ⁵	8.5
<u>Natuna's joint venture</u>	<u>Company's interest (%)</u>
Natuna Sea A	11.5
<u>PTTEP BL's joint venture</u>	<u>Company's interest (%)</u>
Barreirinhas AP 1	25
Brazil BM-ES-23	20
<u>PTTEP SP's joint venture</u>	<u>Company's interest (%)</u>
Contract 4 (B12/27)	15
Sinphuhorm (E5 North and EU-1)	35
<u>PTTEP G7's joint venture</u>	<u>Company's interest (%)</u>
Contract 4 (G7/50) ¹	-
<u>PTTEP HKO's joint venture</u>	<u>Company's interest (%)</u>
Sarawak SK410B	42.5
Sarawak SK417	80
Sarawak SK438	80
Peninsular PM407 ⁶	55
Peninsular PM415 ⁶	70
<u>PTTEP MEP's joint venture</u>	<u>Company's interest (%)</u>
Mexico Block 12 (2.4)	20
Mexico Block 29 (2.4)	16.67

⁵ Change project name from Mozambique Rovuma Offshore Area 1 to Mozambique Area 1

⁶ On March 21, 2019, PTTEP HK Offshore Limited (PTTEP HKO), a subsidiary of the Group, entered into the Production Sharing Contract to obtain the exploration and production rights of 2 offshore exploration blocks located in the coast of Peninsula, Malaysia, which are PM407 and PM415, in which PTTEP HKO holds 55% and 70% participating interests, respectively. PTTEP HKO is the operator of the 2 blocks.

<u>PTTEP ED's joint venture</u>	<u>Company's interest (%)</u>
G1/61 ⁷	60
G2/61 ⁷	100
<u>PTTEP MENA's joint venture</u>	<u>Company's interest (%)</u>
Abu Dhabi Offshore 1 ⁸	30
Abu Dhabi Offshore 2 ⁸	30
<u>PTTEP SBO's joint venture</u> ⁹	<u>Company's interest (%)</u>
Malaysia Block K	
● Kikeh	56
● SNP	22.4
● GK	6.366
Malaysia Block H	
● Rotan	56
● Others	42
<u>PTTEP SKO's joint venture</u> ⁹	<u>Company's interest (%)</u>
Sarawak SK314A	59.5
Sarawak SK405B	59.5
Sarawak SK309 and SK311	
● East Patricia	42
● Others	59.5

⁷ On February 25, 2019, PTTEP Energy Development Company Limited (PTTEP ED), a subsidiary of the Group, entered into the Production Sharing Contract and production rights of the exploration blocks G1/61 and G2/62, PTTEP ED holds 60% and 100% participating interests, respectively. PTTEP ED is the operator of the 2 blocks.

⁸ On January 12, 2019, PTTEP MENA Limited (PTTEP MENA), a subsidiary of the 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, the United Arab Emirates. PTTEP MENA holds 30% participating interests during the exploration period.

⁹ On March 21, 2019, PTTEP HK Offshore Limited (PTTEP HKO), a subsidiary of the Group, signed the Share Sale and Purchase Agreement (SPA) to acquire the 100% shareholding interests of Murphy Oil Corporation (Murphy) in Malaysia through acquisition of shares in Murphy's subsidiaries, which are Murphy Sabah Oil Co., Ltd. (Murphy Sabah) and Murphy Sarawak Oil Co., Ltd. (Murphy Sarawak). The acquisition was completed on July 10, 2019 as disclosed in Note 6 - Business acquisition Murphy Oil Corporation in Malaysia.

<u>Partex Holding B.V. Group</u> ¹⁰	<u>Company's interest (%)</u>
Angola Block 17/06	2.5
Potiguar	50
Dunga	20
PDO Block 6	2
Mukhaizna Block 53	1

As at December 31, 2019, details of properties' net book value are as follows:

Unit: Million USD

Details of properties	Historical cost	Accumulated depreciation	Allowance for impairment of assets	Net book value
Oil and Gas Properties	30,258.94	(19,937.02)	(329.88)	9,992.04
Exploration and Evaluation Assets	4,365.69	-	(1,726.20)	2,639.49
Goodwill	2,173.25	-	(112.39)	2,060.86
Pipeline and Others	1,283.47	(476.30)	(5.25)	801.92
Total	38,081.35	(20,413.32)	(2,173.72)	15,494.31

¹⁰ On June 17, 2019, PTTEP HK Holding Limited (PTTEP HK), a subsidiary of the Group, signed the Share Sale and Purchase Agreement (SPA) to acquire the 100% shareholding interests of Partex Holding B.V. (Partex). The acquisition was completed on November 4, 2019 as disclosed in Note 7 - Business acquisition Partex Holding B.V.

4.2 Investments

PTTEP has details of subsidiaries, associates, joint operations and joint ventures presented as follows:

Company name	Registered country	Type of business	Participating interest (%) (including indirect holding)	
			Dec 31, 2019	Dec 31, 2018
<u>Subsidiaries</u>				
1. PTTEP International Limited (PTTEPI)	Thailand	Petroleum	100	100
2. PTTEP Offshore Investment Company Limited (PTTEPO)	Cayman Islands	Petroleum	100	100
3. PTTEP Services Limited (PTTEP Services)	Thailand	Human resource support	100	100
4. PTTEP Siam Limited (PTTEPS)	Thailand	Petroleum	100	100
5. PTTEP HK Holding Limited (PTTEP HK)	Hong Kong	Petroleum	100	100
6. PTTEP Treasury Center Company Limited (PTTEP TC)	Thailand	Treasury center for the Group's business	100	100
7. PTTEP Energy Holding (Thailand) Company Limited (PTTEP EH)	Thailand	Petroleum	100	100
8. PTTEP Business Center Company Limited (PTTEP BC)	Thailand	Petroleum	100	100
9. PTTEP Energy Development Company Limited (PTTEP ED)	Thailand	Petroleum	100	100
10. EP-Tech Ventures Holding Company Limited (EP-Tech)	Thailand	Petroleum-related Technology	100	100
11. AI and Robotics Ventures Company Limited (ARV)	Thailand	Technology	100	100
12. PTTEP Southwest Vietnam Company Limited (PTTEP SV)	Cayman Islands	Petroleum	100	100
13. PTTEP Kim Long Vietnam Company Limited (PTTEP KV)	Cayman Islands	Petroleum	100	100
14. PTTEP Hoang-Long Company Limited (PTTEP HL)	Cayman Islands	Petroleum	100	100
15. PTTEP Hoan-Vu Company Limited (PTTEP HV)	Cayman Islands	Petroleum	100	100
16. PTTEP Algeria Company Limited (PTTEP AG)	Cayman Islands	Petroleum	100	100
17. PTTEP Holding Company Limited (PTTEPH)	Cayman Islands	Petroleum	100	100
18. PTTEP Indonesia Company Limited (PTTEP ID)	Cayman Islands	Petroleum	100	100
19. PTTEP Africa Investment Limited (PTTEP AI)	Cayman Islands	Petroleum	100	100
20. PTTEP Australia Pty Ltd (PTTEP AU)	Commonwealth of Australia	Petroleum	100	100
21. PTTEP Australia Offshore Pty Ltd (PTTEP AO)	Commonwealth of Australia	Petroleum	100	100
22. PTTEP South Asia Limited (PTTEP SA)	Cayman Islands	Petroleum	100	100
23. PTTEP Semai II Limited (PTTEP SM)	Cayman Islands	Petroleum	100	100

Company name	Registered country	Type of business	Participating interest (%) (including indirect holding)	
			Dec 31, 2019	Dec 31, 2018
Subsidiaries (continued)				
24. PTTEP Australia Perth Pty Ltd (PTTEP AP)	Commonwealth of Australia	Petroleum	100	100
25. PTTEP Australia Browse Basin Pty Ltd (PTTEP AB)	Commonwealth of Australia	Petroleum	100	100
26. PTTEP Australia Timor Sea Pty Ltd (PTTEP AT)	Commonwealth of Australia	Petroleum	100	100
27. PTTEP Australasia (Operations) Pty Ltd (PTTEP AAO)	Commonwealth of Australia	Petroleum	100	100
28. PTTEP Australasia (Ashmore Cartier) Pty Ltd (PTTEP AAA)	Commonwealth of Australia	Petroleum	100	100
29. PTTEP Australasia (Staff) Pty Ltd (PTTEP AAS)	Commonwealth of Australia	Petroleum	100	100
30. PTTEP International Holding Company Limited (PTTEP IH)	Cayman Islands	Petroleum	100	100
31. PTTEP Southwest Vietnam Pipeline Company Limited (PTTEP SVPC)	Cayman Islands	Gas pipeline transportation	100	100
32. PTTEP FLNG Holding Company Limited (PTTEP FH) ¹	Hong Kong	Petroleum	100	100
33. PTTEP Netherland Holding Limited (PTTEP NL)	Cayman Islands	Petroleum	100	100
34. JV Marine Limited (JV Marine)	Cayman Islands	Petroleum	100	100
35. PTTEP South Mandar Limited (PTTEP SMD)	Cayman Islands	Petroleum	100	100
36. PTTEP South Sageri Limited (PTTEP SS)	Cayman Islands	Petroleum	100	100
37. PTTEP Sadang Limited (PTTEP SD)	Cayman Islands	Petroleum	100	100
38. PTTEP Malunda Limited (PTTEP ML)	Cayman Islands	Petroleum	100	100
39. PTTEP Netherlands Coöperatie U.A. (PTTEP NC)	Netherlands	Petroleum	100	100
40. PTTEP Canada Limited (PTTEP CA)	Canada	Petroleum	100	100
41. PTTEP Canada International Finance Limited (PTTEP CIF)	Canada	Investment funding for the Group's business	100	100

¹ On August 24, 2017, the Company approved for the registration for the dissolution of PTTEP FLNG Holding Company Limited (PTTEP FH). It is currently in the process of the dissolution.

Company name	Registered country	Type of business	Participating interest (%) (including indirect holding)	
			Dec 31, 2019	Dec 31, 2018
Subsidiaries (continued)				
42. Cove Energy Limited (Cove)	United Kingdom of Great Britain and Northern Ireland	Petroleum	100	100
43. Cove Energy Mozambique Rovuma Onshore Limited (CEMROL) ¹	Republic of Cyprus	Petroleum	100	100
44. Cove Energy East Africa Limited (CEEAL)	Republic of Cyprus	Petroleum	100	100
45. PTTEP Mozambique Area 1 Limited (PTTEP MZA1)	Republic of Cyprus	Petroleum	100	100
46. Cove Energy Kenya Limited (CEKL) ²	Republic of Kenya	Petroleum	100	100
47. PTTEP Netherlands Holding Coöperatie U.A. (PTTEP NH)	Netherlands	Petroleum	100	100
48. PTTEP Brazil Investment B.V. (PTTEP BI)	Netherlands	Petroleum	100	100
49. PTTEP Brazil Investments in Oil and Gas Exploration and Production Limitada (PTTEP BL)	Federative Republic of Brazil	Petroleum	100	100
50. Sinphuhorm Holdings Limited (SHL)	Cayman Islands	Petroleum	100	100
51. PTTEP SP Limited (PTTEP SP)	United Kingdom of Great Britain and Northern Ireland	Petroleum	100	100
52. PTTEP G7 Limited (PTTEP G7)	Thailand	Petroleum	100	100
53. PTTEP HK Offshore Limited (PTTEP HKO)	Hong Kong	Petroleum	100	100
54. PTTEP MENA Limited (PTTEP MENA)	Hong Kong	Petroleum	100	100
55. PTTEP Mexico E&P Limited, S.de R.L. de C.V. (PTTEP MEP)	Mexico	Petroleum	100	100
56. PTTEP Sabah Oil Limited (PTTEP SBO) ³	Bahamas	Petroleum	100	-
57. PTTEP Sarawak Oil Limited (PTTEP SKO) ⁴	Bahamas	Petroleum	100	-

¹ On May 22, 2017, the Company approved for the registration for the dissolution of Cove Energy Mozambique Rovuma Onshore Limited (CEMROL). It is currently in the process of the dissolution.

² On May 22, 2017, the Company approved for the registration for the dissolution of Cove Energy Kenya Limited (CEKL). It is currently in the process of the dissolution.

³ On July 10, 2019, PTTEP HK Offshore Limited (PTTEP HKO), a subsidiary of the Group, acquired the 100% shareholding interests of Murphy Sabah Oil Co., Ltd. (Murphy Sabah) and Murphy Sarawak Oil Co., Ltd. (Murphy Sarawak) as disclosed in Note 6 - Business acquisition Murphy Oil Corporation in Malaysia and change the name to PTTEP Sabah Oil Limited (PTTEP SBO) and PTTEP Sarawak Oil Limited (PTTEP SKO) respectively.

Company name	Registered country	Type of business	Participating interest (%) (including indirect holding)	
			Dec 31, 2019	Dec 31, 2018
Subsidiaries (continued)				
58. Partex Holding B.V. (PHBV) ⁴	Netherlands	Petroleum	100	-
59. Partex Oil and Gas (Holdings) Corporation (POGHC) ⁵	Cayman Islands	Petroleum	100	-
60. Partex (Kazakhstan) Corporation (PKC) ⁵	Cayman Islands	Petroleum	100	-
61. Partex (Angola) Corporation (PANG) ⁵	Cayman Islands	Petroleum	100	-
62. Partex (Brazil) Corporation (PBC) ⁵	Cayman Islands	Petroleum	100	-
63. Partex Gas Corporation (PGC) ⁵	Republic of Panama	Petroleum	100	-
64. Partex Services Corporation (PSC) ⁵	Republic of Panama	Petroleum	100	-
65. Participations and Explorations Corporation (PEC) ⁵	Republic of Panama	Petroleum	100	-
66. Partex (Oman) Corporation (POC) ⁵	Republic of Panama	Petroleum	100	-
67. Partex Services Portugal – Serviços para a Indústria Petrolífera, S.A. (PSP) ⁵	Portugal	Petroleum	100	-
68. Partex Brasil Ltda. (PBL) ⁵	Brazil	Petroleum	100	-
69. Partex Brasil Operações Petrolíferas Ltda (PBO) ⁵	Brazil	Human resource support	100	-
Associates⁵				
1. Energy Complex Company Limited (Energy Complex)	Thailand	Property rental services	50	50
2. PTT Digital Solutions Company Limited (PTT Digital)	Thailand	Information technology and communication services	20	20
3. PTTEP AP Group's Associates ⁶	Commonwealth of Australia	Air base services	50	50
4. PTT Global LNG Company Limited (PTT GL)	Thailand	Petroleum	50	50
5. Leismer Aerodrome Limited (LAL)	Canada	Air transportation	32	32

⁴ On November 4, 2019, PTTEP HK Holding Limited (PTTEP HK), a subsidiary of the Group, acquired the 100% shareholding interests of Partex Holding B.V. as disclosed in Note 7 - Business acquisition Partex Holding B.V.

⁵ All investments in associates have been assessed as immaterial to the Group.

⁶ PTTEP AP's group associates are Mungalalu Truscott Airbase Pty Ltd and Troughton Island Pty Ltd.

Company name	Registered country	Type of business	Participating interest (%) (including indirect holding)	
			Dec 31, 2019	Dec 31, 2018
<u>Joint Ventures</u> ¹				
1. Erawan 2 FSO Bahamas Limited (Erawan 2) ²	Bahamas	FSO rental services	13.11	13.11
2. APICO LLC ³	United States	Petroleum	72.8215	-
3. Oman LNG LLC (OLNG) ⁴	Oman	Petroleum	2	-
<u>Joint Operations</u>				
1. Carigali – PTTEPI Operating Company Sdn Bhd. (CPOC)	Malaysia	Petroleum	50	50
2. Moattama Gas Transportation Company (MGTC)	Bermuda	Gas pipeline transportation	25.5	25.5
3. Taninthayi Pipeline Company LLC (TPC)	Cayman Islands	Gas pipeline transportation	19.3178	19.3178
4. Orange Energy Limited (Orange)	Thailand	Petroleum	53.9496	53.9496
5. B8/32 Partners Limited (B8/32 Partners)	Thailand	Petroleum	25.0009	25.0009
6. Hoang-Long Joint Operating Company	Socialist Republic of Vietnam	Petroleum	28.5	28.5
7. Hoan-Vu Joint Operating Company	Socialist Republic of Vietnam	Petroleum	25	25
8. Groupement Bir Seba (GBRS)	People's Democratic Republic of Algeria	Petroleum	35	35
9. Andaman Transportation Limited (ATL)	Cayman Islands	Gas pipeline transportation	80	80
10. Natuna 2 B.V. (Natuna)	Netherlands	Petroleum	50	50

¹ All investments in joint ventures have been assessed as immaterial to the Group.

² Erawan 2 has a 100% shareholding in Asia Pacific Marine Services (EF) B.V.

³ On June 4, 2019, PTTEP SP Limited (PTTEP SP), a subsidiary of the Group, acquired participating interests in APICO LLC as disclosed in Note 19.6 Events during the Accounting Period.

On September 11, 2019, PTTEP HK Holding Limited (PTTEP HK), a subsidiary of the Group, acquired participating interests in APICO LLC as disclosed in Note 19.6 Events during the Accounting Period.

⁴ On November 4, 2019, PTTEP HK Holding Limited (PTTEP HK), a subsidiary of the Group, acquired participating interests in Partex Holding B.V. as disclosed in Note 7 Business acquisition Partex Holding B.V.

Company name	Registered country	Type of business	Participating interest (%) (including indirect holding)	
			Dec 31, 2019	Dec 31, 2018
Joint Operations (continued)				
11. Petroleum Development Oman LLC (PDO) ⁵	Oman	Petroleum	2	-
12. Abu Dhabi Gas Industries Limited (AGP) ¹²	The United Arab Emirates	Petroleum	2	-
13. Private Oil Holdings Oman Limited (POHOL) ¹²	United Kingdom of Great Britain and Northern Ireland	Petroleum	5	-

4.3 Net Book Value

As at December 31, 2019, PTTEP's net book value amounted to 11,841 MMUSD (equivalent to 357,059 MMTHB) or USD 2.98 per share (equivalent to THB 89.94 per share).

⁵ On November 4, 2019, PTTEP HK Holding Limited (PTTEP HK), a subsidiary of the Group, acquired participating interests in Partex Holding B.V. as disclosed in Note 7 Business acquisition Partex Holding B.V.

5. Legal Dispute

As of December 31, 2019, the outstanding legal dispute in which PTTEP or one of the Company's subsidiaries is a party involved as well as a dispute that can significantly affect our operation or the subsidiary's operation, excluding disputes from the normal operation and circumstance, is as follows:

5.1 PTTEP Australasia (Ashmore Cartier) Pty Ltd ("PTTEP AAA") was sued for damages in 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 in the Federal Court of Australia, claiming damages caused by 2009 Montara incident in Australia. The lawsuit was filed after the lapse of the period of prescription for claims. However, on November 15, 2017, the Federal Court of Australia granted an extension of the limitation period due to certain legal exceptions. As of December 31, 2019, the case was still under court proceeding. This lawsuit did not state the amount of claim.

PTTEP and PTTEP AAA continue to maintain the position, based on independent scientific research overseen by the Australian Government, that no spilled 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.

6. General Information and Other Significant Information**6.1 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, 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, 2019

6.2 Subsidiaries and Associated Companies Information

- **Subsidiaries Information**¹

As of December 31, 2019, there were 81 subsidiaries which have the same contact address, telephone and facsimile numbers as PTTEP as in 6.1. 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 and Related Businesses						
1	PTTEP Australia Pty Ltd	PTTEP AU	50,000	Ordinary Share	PTTEPH	100%
2	PTTEP Australia Offshore Pty Ltd	PTTEP AO	50,000	Ordinary Share	PTTEP AU	100%
3	PTTEP Australia Perth Pty Ltd	PTTEP AP	50,000	Ordinary Share	PTTEPH	100%
4	PTTEP Australia Browse Basin Pty Ltd	PTTEP AB	50,000	Ordinary Share	PTTEP AP	100%
5	PTTEP Australasia (Staff) Pty Ltd	PTTEP AAS	10	Ordinary Share	PTTEP AB	100%
6	PTTEP Australasia (Ashmore Cartier) Pty Ltd	PTTEP AAA	1,700,000	Ordinary Share	PTTEP AB	100%
7	PTTEP Australasia (Operations) Pty Ltd	PTTEP AAO	106,686,517	Ordinary Share	PTTEP AB	100%
8	PTTEP Australia Timor Sea Pty Ltd	PTTEP AT	50	Ordinary Share	PTTEP AB	100%
9	PTTEP Sabah Oil Limited	PTTEP SBO	10,000	Ordinary Share	PTTEP HK	100%
10	PTTEP Sarawak Oil Limited	PTTEP SKO	10,000	Ordinary Share	PTTEP HK	100%
11	PTTEP Brasil Investimentos Em Exploração e Produção de Petróleo e Gás Ltda.	PTTEP BL	790,293,700	Ordinary Share	PTTEP BI PTTEP NH	99.9999999% 0.0000001%
12	Partex Brasil Ltda.	PBL	20,008,638 506,611	Ordinary Share	PBC PEC	97.53% 2.47%
13	Partex Brasil Operações Petrolíferas Ltda.	PBO	349,000 1,000	Ordinary Share	PBC PEC	99.71% 0.29%
14	PTTEP Canada Limited	PTTEP CA	3,014,946,540	Ordinary Share	PTTEP NC	100%

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	
15	Cove Energy East Africa Limited	CEEAL	1,000	Ordinary Share	COVE	100%
16	Cove Energy Mozambique Rovuma Onshore Limited	CEMROL	1,000	Ordinary Share	CEEAL	100%
17	PTTEP Mozambique Area 1 Limited	PTTEP MZA1	1,000	Ordinary Share	CEEAL	100%
18	PTTEP FLNG Holding Company Limited	PTTEP FH	10,000	Ordinary Share	PTTEP IH	100%
19	PTTEP HK Holding Limited	PTTEP HK	10,000	Ordinary Share	PTTEP	25%
				Ordinary Share	PTTEPI	75%
20	PTTEP HK Offshore Limited	PTTEP HKO	10,000	Ordinary Share	PTTEP HK	100%
21	PTTEP MENA Limited	PTTEP MENA	500	Ordinary Share	PTTEP BC	100%
22	Cove Energy Kenya Limited ²	CEKL	1,000	Ordinary Share	CEEAL	99.9%
				Ordinary Share	COVE	0.1%
23	PTTEP Offshore Investment Company Limited	PTTEPO	6,667	Ordinary Share	PTTEP	75%
				Ordinary Share	PTTEPI	25%
24	PTTEP Holding Company Limited	PTTEPH	50,000	Ordinary Share	PTTEPO	100%
25	Sinphuhorm Holdings Limited	SHL	100	Ordinary Share	PTTEPO	100%
26	PTTEP International Holding Company Limited	PTTEP IH	50,000	Ordinary Share	PTTEPH	100%
27	PTTEP Africa Investment Limited	PTTEP AI	50,000	Ordinary Share	PTTEPH	100%
28	JV Marine Limited	JV Marine	50,000	Ordinary Share	PTTEP IH	100%
29	PTTEP Netherland Holding Limited	PTTEP NL	50,000	Ordinary Share	PTTEP IH	100%
30	PTTEP Indonesia Company Limited	PTTEP ID	50,000	Ordinary Share	PTTEPH	100%
31	PTTEP Sadang Limited	PTTEP SD	50,000	Ordinary Share	PTTEP ID	100%
32	PTTEP Semai II Limited	PTTEP SM	50,000	Ordinary Share	PTTEP ID	100%
33	PTTEP South Mandar Limited	PTTEP SMD	50,000	Ordinary Share	PTTEP ID	100%
34	PTTEP South Sageri Limited	PTTEP SS	50,000	Ordinary Share	PTTEP ID	100%

² In liquidation process

No.	Company Name	Abbreviation	Number of Shares Sold		Total Direct/Indirect Holding	
35	PTTEP Malunda Limited	PTTEP ML	50,000	Ordinary Share	PTTEP ID	100%
36	PTTEP Algeria Company Limited	PTTEP AG	50,000	Ordinary Share	PTTEPO	100%
37	PTTEP Hoang-Long Company Limited	PTTEP HL	50,000	Ordinary Share	PTTEPO	100%
38	PTTEP Hoan-Vu Company Limited	PTTEP HV	50,000	Ordinary Share	PTTEPO	100%
39	PTTEP Kim Long Vietnam Company Limited	PTTEP KV	50,000	Ordinary Share	PTTEPO	100%
40	PTTEP Southwest Vietnam Company Limited	PTTEP SV	50,000	Ordinary Share	PTTEPO	100%
41	PTTEP South Asia Limited	PTTEP SA	50,000	Ordinary Share	PTTEPH	100%
42	Partex (Brazil) Corporation	PBC	50,000	Ordinary Share	PHBV	100%
43	Partex (Kazakhstan) Corporation	PKC	500	Ordinary Share	PHBV	100%
44	Partex (Angola) Corporation	PANG	50,000	Ordinary Share	PHBV	100%
45	Partex Oil and Gas (Holdings) Corporation ³	POGHC	50,000	Ordinary Share	PHBV	100%
46	PTTEP Mexico E&P Limited, S. de R.L. de C.V.	PTTEP MEP	3,000	Ordinary Share	PTTEP HK	99%
				Ordinary Share	PTTEP HKO	1%
47	Carigali-PTTEPI Operating Company SDN BHD	CPOC	350,000	Ordinary Share	PTTEPI	50%
48	PTTEP Netherlands Coöperatie U.A.	PTTEP NC	-	-	PTTEP IH	0.00005%
					PTTEP NL	99.99995%
49	PTTEP Netherlands Holding Coöperatie U.A.	PTTEP NH	-	-	PTTEP HK	75%
					PTTEPI	25%
50	PTTEP Brazil Investment B.V.	PTTEP BI	50,000	Ordinary Share	PTTEP NH	100%
51	Natuna 2 B.V.	Natuna	90,000	Ordinary Share	PTTEP NH	50%
52	Partex Holding B.V.	PHBV	100,000	Ordinary Share	PTTEP HK	100%
53	Participations and Explorations Corporation	PEC	2,500	Ordinary Share	PHBV	100%
54	Partex (Oman) Corporation	POC	2,500	Ordinary Share	PHBV	100%

³ Dormant Company

No.	Company Name	Abbreviation	Number of Shares Sold		Total Direct/Indirect Holding	
55	Partex Gas Corporation	PGC	2,000,000	Ordinary Share	PHBV	100%
56	Partex Services Corporation	PSC	3,000	Ordinary Share	PHBV	100%
57	Partex Services Portugal – Serviços para a Indústria Petrolífera, S.A.	PSP	50,000	Ordinary Share	PHBV	100%
58	PTTEP International Limited	PTTEPI	2,000,000,000	Ordinary Share	PTTEP	100%
59	PTTEP Siam Limited	PTTEPS	1,000,000	Ordinary Share	PTTEP	51%
				Ordinary Share	PTTEPO	49%
60	Orange Energy Limited	ORANGE	1,000,000	Ordinary Share	PTTEPO	53.95%
					MOECO B.V.	36.05%
					KrisEnergy	10%
61	PTTEP G7 Limited	PTTEP G7	8,030,741	Ordinary Share	PTTEPI	100%
62	PTTEP Energy Holding (Thailand) Company Limited	PTTEP EH	87,579,936	Ordinary Share	PTTEP	100%
63	PTTEP Energy Development Company Limited	PTTEP ED	24,055,000	Ordinary Share	PTTEP EH	100%
64	EP-Tech Ventures Holding Company Limited	EP-Tech	310,000	Ordinary Share	PTTEP EH	100%
65	Apico (Khorat) Limited	APICO KL	5,845,168	Ordinary Share	APICO KH	100%
66	Cove Energy Limited	Cove	63,840,000	Ordinary Share	PTTEP AI	100%
67	PTTEP SP Limited	PTTEP SP	2	Ordinary Share	SHL	100%
			61,279,585			
68	APICO LLC	APICO	338,278	Ordinary Share	PTTEP SP	33.83%
			389,937		PTTEP HK	38.99%
69	APICO (Khorat) Holdings LLC	APICO KH	-	Ordinary Share	APICO	100%
Service Business						
70	PTTEP Services Limited (Personnel services support)	PTTEP Services	1,000,000	Ordinary Share	PTTEP	25%
					PTTEPI	75%
71	Andaman Transportation Limited (Investments in gas pipeline projects in Myanmar)	ATL	62,500	Ordinary Share	PTTEPO	80%
					MOGE	20%

No.	Company Name	Abbreviation	Number of Shares Sold		Total Direct/Indirect Holding	
72	PTTEP Southwest Vietnam Pipeline Company Limited (Investments in gas pipeline projects in Vietnam)	PTTEP SVPC	50,000	Ordinary Share	PTTEPH	100%
73	PTTEP Canada International Finance Limited (Raise fund for PTTEP business)	PTTEP CIF	50,000	Ordinary Share	PTTEP NC	100%
74	PTTEP Treasury Center Company Limited (Treasury center for PTTEP and subsidiaries)	PTTEP TC	10,000,000	Ordinary Share	PTTEP PTTEPI	25% 75%
75	PTTEP Business Center Company Limited (Business center for PTTEP and subsidiaries)	PTTEP BC	573,386,860	Ordinary Share	PTTEP EH	100%
Other Business						
76	AI and Robotics Ventures Company Limited (Research and Development and providing service for AI and Robotics)	ARV	300,000	Ordinary Share	EP-Tech	100%
77	Energy Complex Company Limited (Property Leasing)	EnCo	180,000,000	Ordinary Share	PTTEP	50%
78	PTT Global LNG Company Limited (Investment in LNG Business)	PTTGL	10,421,446,000	Ordinary Share	PTTEP BC	50%
79	PTTGL Investment Limited (Investment in LNG Business)	PTTGLI	309,825,000	Ordinary Share	PTTGL	100%
80	Mungalalu Truscott Airbase Pty Ltd (Air Base Operations)	MTA	600	Ordinary Share	PTTEP AAO	50%
81	Troughton Island Pty Ltd (Secondary)	TTI	100	Ordinary Share	PTTEP AAO	50%

- **Associated Companies' Information⁴**

As of December 31, 2019, PTTEP had 20 associated companies. Details of the directors designated by the PTTEP Group for each associated company are disclosed in Attachment.

No.	Company Name	Type of Business	Abbreviation	Number of Shares Sold		Total Direct/Indirect Holding
1	PTT Digital Solutions Company Limited	Information Technology and Communication Services	PTT Digital	15,000,000	Ordinary Share	PTTEP 20%
	Head Office: 555/1 Energy Complex Building A, 4 th -5 th Floor, Vibhavadi Rangsit Road, Chatuchak, Bangkok 10900, Thailand					
	Telephone: +66-2537-3456					
	Facsimile: +66-2537-2935					
2	B8/32 Partners Limited	Petroleum Exploration and Production	B 8/32 Partners	110,000	Ordinary Share	PTTEPO 25%
	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: -					
3	Sarn Palung Social Enterprise Company Limited	Social Enterprise	SPSE	1,000,000	Ordinary Share	PTTEP 15%
	Head Office: 555/1 Energy Complex Building A, 10 th Floor, Vibhavadi Rangsit Road, Chatuchak, Bangkok 10900, Thailand					
	Telephone: +66-2537-2971					
	Facsimile: -					

⁴ 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	Type of Business	Abbreviation	Number of Shares Sold		Total Direct/Indirect Holding
4	Moattama Gas Transportation Company	Gas Pipeline in Myanmar	MGTC	1,000,000	Ordinary Share	PTTEPO 25.5%
	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					
5	Taninthayi Pipeline Company LLC	Gas Pipeline in Myanmar	TPC	100,000	Ordinary Share	PTTEPO 19.31784%
	Head Office: 16 Shwe Taung Kyar Bahan, Yangon, Myanmar					
	Telephone: +95-1-526-411-4					
	Facsimile: +95-1-525-698					
6	Hoang Long Joint Operating Company	Petroleum Exploration and Production	HL JOC	- ⁵	-	PTTEP HL 28.5%
	Head Office: Suite 2001, Me Linh Point Tower, 2 Ngo Duc Ke Street, District 1, Ho Chi Mihn City, S.R. Vietnam					
	Telephone: +84-8-3829-9359					
	Facsimile: +84-8-3822-6106					
7	Hoan-Vu Joint Operating Company	Petroleum Exploration and Production	HV JOC	- ⁶	-	PTTEP HV 25%
	Head Office: Suite 2006, Me Linh Point Tower, 2 Ngo Duc Ke Street, District 1, Ho Chi Mihn City, S.R. Vietnam					
	Telephone: +84-8-3823-9525					
	Facsimile: +84-8-3823-9526					

⁵ No share was issued. Percentage of shareholding is subject to participation interest in the concession.

⁶ 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
8	Groupement Bir Seba	Petroleum Exploration and Production	GBRS	7	-	PTTEP AG 35%
	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					
9	Leismer Aerodrome Limited	Air Base Operations	LAL	200	Ordinary Share	PTTEP CA 32%
	Head Office: 1200, 215 – 9 th Avenue SW Calgary, AB T2P 1K3, Canada					
	Telephone: +1-403-237-8227					
	Facsimile: +1-403-264-4640					
10	MOZ LNG1 Holding Company Ltd.	Petroleum Exploration and Production	MOZ LNG1 Holding	1,000,000	Ordinary Share	PTTEP MZA1 8.5%
	Head Office: 3412 ResCo-work08, 34, Al Maqam Tower, Abu Dhabi Global Market Square, Al Maryah Island, Abu Dhabi, United Arab Emirates					
	Telephone: -					
	Facsimile: -					
11	MOZ LNG1 Financing Company Ltd.	Petroleum Exploration and Production	MOZ LNG1 Financing	100	Ordinary Share	MOZ LNG1 Holding 100%
	Head Office: 3510, 35 th Floor, A1 Maqam Tower, ADGM Square, A1 Maryah Island, Abu Dhabi, United Arab Emirates					
	Telephone: -					
	Facsimile: -					

⁷ 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
12	Mozambique LNG 1 Company Pte. Ltd.	Petroleum Exploration and Production	MZ LNG1	2,500	Ordinary Share	MOZ LNG1 Holding 100%
	Head Office: 50 Raffles Place #60-00 Singapore Land Tower, Singapore 048623					
	Telephone: -					
	Facsimile: -					
13	Erawan 2 FSO Bahamas Ltd.	Lease of FSO (vessel)	Erawan 2 FSO Bahamas	100	Ordinary Share	JV Marine 13.11%
	Head Office: Ocean Center, Montagu Foreshore, East Bay Street, Nassau, New Providence, Bahamas P.O. Box SS-19084					
	Telephone: -					
	Facsimile: -					
14	Asia Pacific Marine Services (EF) B.V.	Lease of FSO (vessel)	Asia Pacific Marine Services	18,000	Ordinary Share	Erawan 2 FSO 100%
	Head Office: Naritaweg 165, Telestone 8, 1043 BW Amsterdam, The Netherlands					
	Telephone: -					
	Facsimile: -					
15	PETRONAS LNG 9 SDN. BHD.	LNG Liquefaction Plant	PL9SB	39,563	Ordinary Share	PTTGLI 10%
	Head Office: Tower 1, PETRONAS Twin Towers, Kuala Lumpur City Centre, 50088 Kuala Lumpur, Malaysia					
	Telephone: +60-320-515-000					
	Facsimile: -					

No.	Company Name	Type of Business	Abbreviation	Number of Shares Sold		Total Direct/Indirect Holding
16	Private Oil Holdings Oman Limited	Holding of participating interests in oil and gas	POHOL	649,152	Ordinary Share	POC 5%
	Head Office: 8 York Road, London, England, SE1 7NA					
	Telephone: -					
	Facsimile: -					
17	Petroleum Development Oman LLC	Petroleum Exploration and Production	PDO	1,720	Ordinary Share	POHOL 2%
	Head Office: Mina A1 Fahal, Muscat, The Sultanate of Oman					
	Telephone: +968 24678111					
	Facsimile: Telex: 5212, Petro ON Cable: Petro Muscat					
18	Oman LNG LLC	LNG Facility	OLNG	1,209,877	Ordinary Share	POC 2%
	Head Office: Ghala, P.O. Box 560, C.P.O, P.C. 116 The Sultanate of Oman					
	Telephone: +968-24609999					
	Facsimile: +968-24625406					
19	QALAHAT LNG SAOC	LNG Facility	QLNG	1,795,000	Ordinary Share	OLNG 0.736%
	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: +968-24625400					
	Facsimile: +968-24625406					

No.	Company Name	Type of Business	Abbreviation	Number of Shares Sold		Total Direct/Indirect Holding
20	Abu Dhabi Gas Industries Limited	Gas Processing Facility	AGP	8,000	Ordinary Share	PGC 2%
	Head Office: P.O. Box 665, Abu Dhabi, UAE					
	Telephone: +971 2 7070000					
	Facsimile: +971 2 6023389					

6.3 References

1) Share Registrar

1.1)	Name	Thailand Securities Depository Company Limited
	Address	93, Ratchadaphisek Road, Dindaeng, 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 Bank Public Company Limited
Address	Floor 5A, 3000 Phahon Yothin Road, Chatuchak, Bangkok 10900, Thailand
Telephone	+66-2299-1824, +66-2299-1825
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	14 th Floor, Zone A, 9 Ratchadaphisek Road, Chatuchak, Bangkok 10900, Thailand
Telephone	+66-2795-4153
Facsimile	+66-2544-7475

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	14 th Floor, Zone A, 9 Ratchadaphisek Road, Chatuchak, Bangkok 10900, Thailand
Telephone	+66-2795-4153
Facsimile	+66-2544-7475

4) Trustee

- 4.1) Trustee for outstanding USD 700 million debentures issued in April 2011, outstanding USD 30 million subordinated perpetual capital debentures issued in July 2017, outstanding USD 650 million debentures issued in December 2019.

Name BNY Mellon Corporate Trust
Address #04-01 Millenia Tower, 1 Temasek Avenue, Singapore 039192
Telephone +65-6432-0351, +65-6432-4036
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
Facsimile +852-2323-0279

5) Registrar and Paying Agent

- 5.1) Registrar and paying agent for bills of exchange with a total revolving credit of up to THB 50,000 million.

Name TMB Bank Public Company Limited
Address Floor 5A, 3000 Phahonyothin Road, Chom Phon, Chatuchak,
Bangkok 10900, Thailand
Telephone +66-2299-1824, +66-2299-1825
Facsimile +66-2242-3270

6) Facility Agent

- 6.1) 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 0041, +65 6878 7650
Facsimile +65 6324 4427

7) Process Agent for Bank Loan

- 7.1) Process agent for USD 600 million loan agreement dated in June 2019.

Name Law Debenture Corporate Services Limited
Address 801 2nd Avenue, Suite 403, New York, NY 10017, USA
Telephone +1-212-750-6474
Facsimile +1-212-883-0630

8) Process Agent for Common Shares

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

9) Cross Currency Swap Counterparties

9.1) **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

9.2) **Name** The Hongkong and Shanghai Banking Corporation Limited, Bangkok Branch
 Division Global Markets
 Address HSBC Building, 968 Rama IV Road, Silom, Bangrak, Bangkok 10500, Thailand
 Telephone +66-2614-4000
 Facsimile +66-2353-7333

10) FX Contracts Counterparties

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

10.2) **Name** Krung Thai Bank Public Company Limited
 Division Corporate Sales, Global Markets Group
 Address Building 1 (Nana Nua), 8th Floor, 35 Sukhumvit Road, Klongtoey Nua, Wattana,
 Bangkok 10110, Thailand
 Telephone +66-2208-4644
 Facsimile +66-2256-8398

10.3) **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 +66-2937-7969

- 10.4) **Name** Bank of America, National Association (Bangkok Branch)
Division Fixed Income Currencies and Commodities (FICC) Sales
Address 87/2 All Seasons Place, CRC Tower, 20th Floor,
Wireless Road, Lumpini, Pathum Wan, Bangkok 10330, Thailand
Telephone +66-2305-2988, +66-2305-2986
Facsimile +66-2685-3224
- 10.5) **Name** Citibank, N.A. (Thailand)
Division Corporate Sales & Structuring Thailand
Address Interchange 21 Building, 399 Sukhumvit Road, Klongtoey Nua, Wattana,
Bangkok 10110, Thailand
Telephone +66-2788-2785
Facsimile +66-2788-4825-8
- 10.6) **Name** CIMB Thai Bank Public Company Limited
Division Global Sales, Treasury Sales Division
Address 44 Langsuan Road, Lumpini, Pathumwan, Bangkok 10330, Thailand
Telephone +66-2670-4623, +66-2670-4658
Facsimile +66-2657-3282-3
- 10.7) **Name** Bank of Ayudhya Public Company Limited
Division Sales & Trading Division Global Markets Group
Address 550 Ploenchit Road, Lumpini, Pathumwan, Bangkok 10330, Thailand
Telephone +66-2021-6380-1, +66-2021-6385, +66-2021-6207
Facsimile +66-2296-6908
- 10.8) **Name** Bangkok Bank Public Company Limited
Division Treasury Division
Address 333 Silom Road, Silom, Bangrak, Bangkok 10500, Thailand
Telephone +66-2021-1111
Facsimile +66-2636-4633
- 10.9) **Name** TMB Bank Public Company Limited
Division Capital Markets
Address 3000 Phahon Yothin Road, Chatuchak, Bangkok 10900, Thailand
Telephone +66-2676-8008
Facsimile +66-2292-4690-2

- 10.10) **Name** Deutsche Bank AG, Bangkok Branch
Division Corporate Treasury Sales
Address 63 Athenee Tower, 27th-29th Floor, Wireless Road, Lumpini,
Pathum Wan, Bangkok 10330, Thailand
Telephone +66-2646-5139
Facsimile +66-2651-5892
- 10.11) **Name** BNP Paribas Bangkok Branch
Division Global Markets, FXLM Sales Corporate
Address 990 Abdulrahim Place, 29th Floor, Rama IV Road, Silom, Bangrak,
Bangkok 10500, Thailand
Telephone +66-2659-8990
Facsimile +66-2636-1929
- 10.12) **Name** United Overseas Bank (Thai) Public Company Limited
Division Global Markets
Address 191 South Sathon Road, Yannawa, Sathorn, Bangkok 10120, Thailand
Telephone +66-2343-4381-4
Facsimile +66-2285-1365
- 10.13) **Name** J.P. Morgan Chase Bank N.A.
Division Global Emerging Markets
Address 20 Buhajit Building, 2nd Floor, North Sathon Road, Silom, Bangrak,
Bangkok 10500, Thailand
Telephone +66-2684-2247
Facsimile +66-2684-2260
- 10.14) **Name** ANZ Bank (Thai) Public Company Limited
Division Corporate Sales
Address 63 Athenee Tower, 8th Floor, Unit 801-806, Wireless Road, Lumpini,
Pathumwan, Bangkok, 10330, Thailand
Telephone +66-2263-9722
Facsimile +66-2263-9700

11) Auditor

11.1) Name State Audit Office of the Kingdom of Thailand
Address Soi Areesampan, Rama VI Road, Phayathai, Bangkok 10400, Thailand
Telephone +66-2271-8025
Facsimile +66-2618-5800

12) Legal Advisors

12.1) Name Linklaters (Thailand) Ltd.
Address 20th Floor, Capital Tower, All Seasons Place,
87/1, Wireless Road, Bangkok 10330, Thailand
Telephone +66-2305-8000
Facsimile +66-2305-8010

12.2) Name Weerawong, Chinnavat & Partners Ltd.
Address 22nd Floor, Mercury Tower
540, Phloen Chit Road, Lumpini, Pathumwan, Bangkok 10330, Thailand
Telephone +66-2264-8000
Facsimile +66-2657-2222

12.3) Name Siam Premier International Law Office Limited
Address 26th Floor, The Offices of Central World,
999/9 Rama I Road, Pathumwan, Bangkok 10330, Thailand
Telephone +66-2646-1888
Facsimile +66-2646-1919

12.4) Name Allen & Overy (Thailand) Co., Ltd.
Address 23rd Floor, Sindhorn Building 3
130 – 132, Wireless Road, Lumpini, Pathumwan, Bangkok 10330, Thailand
Telephone +66-2263-7600
Facsimile +66-2653-7699

12.5) Name Herbert Smith Freehills (Thailand) Limited
Address 1403 Abdulrahim Place,
990 Rama IV Road, Silom, Bangrak, Bangkok 10500, Thailand
Telephone +66-2657-3888
Facsimile +66-2636-0657

- 12.6) **Name** Baker & McKenzie Abogados, S.C.
Address Edificio Virreyes, Pedregal 24, Piso 12,
Lomas Virreyes / Col. Molino del Rey
México City, 11040 Mexico
Telephone +52-55-5279-2900
Facsimile +52-55-5279-2999
- 12.7) **Name** Clifford Chance
Address 27th Floor, Jardine House, One Connaught Place,
Hong Kong, Hong Kong (SAR)
Telephone +852-2825-8888
Facsimile +852-2825-8800
- 12.8) **Name** Jones Day
Address 138 Market Street, Level 28 Capita Green, Singapore 048946
Telephone +65-6538-3939
Facsimile +65-6538-3939
- 12.9) **Name** King & Spalding (Singapore) LLP
Address 1 Raffles Quay, #31-01 North Tower, Singapore 048583
Telephone +65-6303-6000
Facsimile +65-6303-6000
- 12.10) **Name** Shearman & Sterling LLP
Address 6 Battery Road #25-03, Singapore 049909
Telephone +65-6230-3800
Facsimile +65-6230-3899
- 12.11) **Name** Slaughter and May
Address One Bunhill Row, London EC1Y8YY, UK
Telephone +4420-7600-1200
Facsimile +4420-7090-5000
- 12.12) **Name** Trowers & Hamblins LLP
Address Office 902, Floor 9, Tower C1, Al Bateen Towers,
King Abdullah Bin Abdulaziz Al Saud St,
P.O. Box 37021, Abu Dhabi, United Arab Emirates
Telephone +971-2410-7600
Facsimile +971-2410-7601

13) Advisor to the Board of Directors

13.1) Name	Mr. Tongchat Hongladarom
Address	8 Room 8/48 Prasanmit Condominium, Sukhumvit 23, Klongtoey Nua, Wattana, Bangkok 10110, Thailand
Telephone	+66-2258-4363
Facsimile	+66-2258-4363

6.4 Other Significant Information

- None -

7. Securities and Shareholders

7.1 Capital Structure

As of December 31, 2019, PTTEP's capital structure consisted of USD 3,442 million in interest-bearing debt and USD 11,841 million in shareholders' equity, amounting to an interest-bearing-debt-to-shareholders' equity ratio of 0.29x. Details of the capital structure are as follows:

7.1.1 Securities

Capital Stock

As of December 31, 2019, 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.

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.

In 2019, PTTEP Group redeemed, issued, offered and sold debentures per the following details:

- On May 29, 2019, the Company redeemed in full, its THB 5,000 million unsecured and unsubordinated debentures on the maturity date, and on June 6, 2019 the company redeemed in full, its THB 8,200 million unsecured and unsubordinated debentures on the maturity date.
- On June 18, 2019, the Company redeemed in full on the first call date, its USD 145 million subordinated capital debentures issued on June 18, 2014, and PTTEP Treasury Centre Company Limited (PTTEP TC), a wholly-owned subsidiary of the Company, redeemed in full on the first call date, its USD 355 million subordinated capital debentures issued on July 26, 2017. No subordinated capital debentures were issued during the second quarter of 2019.
- On June 19, 2019, PTTEP TC issued Senior Guaranteed Debentures to institutional and high net-worth investors for a total amount of THB 15,000 million. The debentures, due in 2022, have a tenor of 3-years, bear a fixed interest rate of 2.26% per annum and are fully guaranteed by the company. The proceeds from the debentures issuance were used for working capital and refinancing of senior debt.
- On December 6, 2019, PTTEP TC carried out a liability management exercise on its USD 500 million subordinated perpetual capital debentures issued on July 17, 2017, repurchasing USD 469 million of these debentures, and leaving USD 31 million outstanding. Concurrently, PTTEP TC issued 40-year senior guaranteed debentures to foreign institutional investors for a total amount of USD 650 million, which mature on December 6, 2059, have a fixed coupon of 3.903% per annum, payable semi-annually, and are fully guaranteed by the Company. PTTEP TC subsequently exercised its rights to redeem all of the remaining subordinated perpetual capital debentures in January 2020 at a redemption price in accordance with the terms, conditions and methods prescribed in the bond indenture.

As of December 31, 2019, PTTEP had the following outstanding debentures;

(1) Details of THB debentures (total outstanding amount: THB 26,400 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

¹ The debentures were last rated by TRIS on March 13, 2019 on the company, May 24, 2019 on PTTEP TC.

² 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.

(2) Details of USD debentures (total outstanding amount: USD 1,840 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	April 5, 2011	April 5, 2021	10 years	700 ²	Fixed 5.692%, coupon payment: semi-annually	Baa1	BBB+	BBB+
	June 12, 2012	June 12, 2042	30 years	490 ³	Fixed 6.350%, coupon payment: semi-annually	Baa1	BBB+	BBB+
	December 6, 2019	December 6, 2059	40 years	650 ⁴	Fixed 3.903%, coupon payment: semi-annually	Baa1	NA	BBB+

¹ The latest credit ratings were issued by Moody's on March 28, 2019, Standard & Poor's on October 9, 2019 and Fitch on May 28, 2019.

² Issued by PTTEP CIF, and fully guaranteed by PTTEP.

³ 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.

⁴ 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 <ul style="list-style-type: none"> • payment upon liquidation or • early redemption subject to terms & conditions 	Perpetual	5,000 ²	<ul style="list-style-type: none"> • 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 13, 2019.

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

(4) Details of USD Hybrid Bonds (total outstanding USD 31 million)

Debt Security	Issued Date	Maturity Date	Tenor	Outstanding (Unit: USD Million)	Rate per annum	Credit Rating ¹	
						Moody's	Standard & Poor's
USD Hybrid Bonds, subordinated perpetual capital securities with the issuer's right to defer the distribution at its sole discretion	July 17, 2017	No maturity date <ul style="list-style-type: none"> • payment upon liquidation or • early redemption subject to terms & conditions 	Perpetual	31 ^{2,3}	<ul style="list-style-type: none"> • Year 1-5: 4.60% • Year 6-10: 5 Years UST+2.65% • Year 11-25: 6M LIBOR+2.90% • Year 26 onwards: 6M LIBOR+3.65% • coupon payment: semi-annually 	Baa3	BB+

¹ The latest credit ratings were issued by Moody's on March 28, 2019 and Standard & Poor's on October 9, 2019.

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

³ PTTEP TC was the issuer and repurchased of USD 469 million in 2019, leaving the principal amount of USD 31 million from USD 500 million.

7.1.2 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.

As of February 14, 2020, as published on the official website of the SET, PTTEP had a total of 275,585,608 NVDRs outstanding, representing 6.94 % of the Company's total issued and paid-up capital of 3,969,985,400 shares.

7.2 Shareholders

7.2.1 Major Shareholders

As of February 14, 2020, 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	2,572,020,489	64.79
2.	THAI NVDR COMPANY LIMITED	275,585,608	6.94
3.	STATE STREET EUROPE LIMITED	77,630,594	1.96
4.	SOUTH EAST ASIA UK (TYPE C) NOMINEES LIMITED	69,123,299	1.74
5.	THE BANK OF NEW YORK MELLON	42,279,734	1.06
6.	SOCIAL SECURITY OFFICE	41,893,277	1.06
7.	EGAT SAVING AND CREDIT COOPERATIVE LIMITED	28,131,100	0.71
8.	THE BANK OF NEW YORK (NOMINEES) LIMITED	24,603,351	0.62
9.	SIAM MANAGEMENT HOLDING COMPANY LIMITED (A wholly owned subsidiary of PTT)	19,840,000	0.50
10.	SE ASIA (TYPE B) NOMINEES LLC	15,147,300	0.38
	Total number of shares held by major shareholders	3,166,254,752	79.76
	Total fully-paid capital as of February 14, 2020	3,969,985,400	100

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

7.2.2 NVDR Holders*

Rank	NVDR holders (as of February 14, 2020)	Number of NVDR issues	% of total outstanding shares in underlying stock
1.	STATE STREET BANK AND TRUST COMPANY	38,328,863	0.97
2.	STATE STREET EUROPE LIMITED	36,596,852	0.92
3.	SOUTH EAST ASIA UK (TYPE C) NOMINEES LIMITED	27,802,494	0.70
	Total shares	102,728,209	2.59

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

7.2.3 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, 2019, 2 out of the Company's 15 directors were either directors or executives from PTT.

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

- None -

7.3 Dividend Payment Policy

Under normal circumstances, according to the Company's policy, PTTEP's Board of Directors generally recommends to 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.

However, under the terms and conditions therein, the Company will not declare or make any dividend payments if the Company defers an interest payment or has deferred interest payments outstanding on the subordinated perpetual capital debentures No. 1/2555 of THB 5,000 million, issued in June 2012, and outstanding subordinated perpetual capital debentures of USD 31 million, issued by PTTEP Treasury Center Company Limited (PTTEP TC) in July 2017 and guaranteed by PTTEP.

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

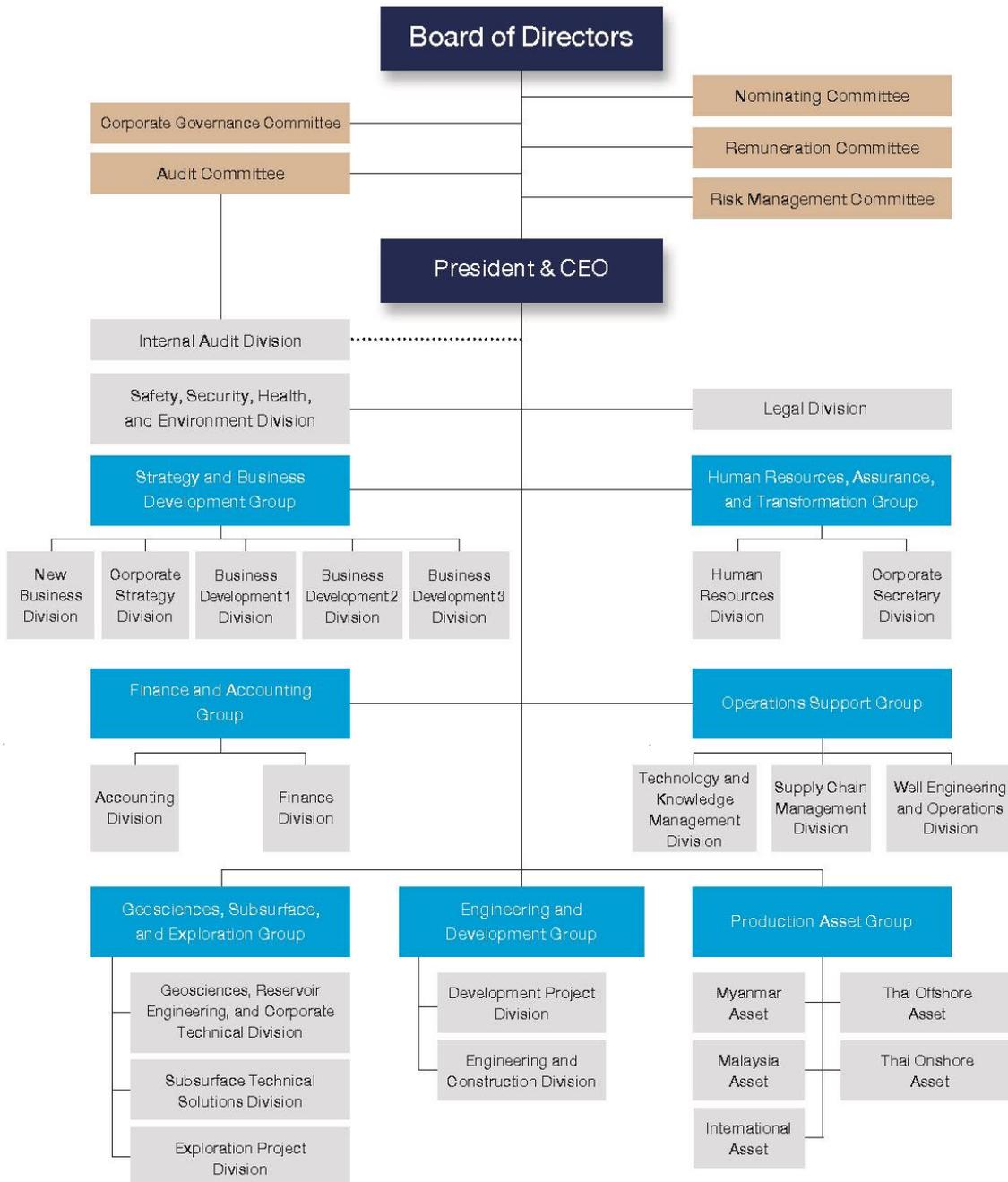
Year	2015	2016	2017	2018	2019
Earnings per Share (THB)	-8.24	2.76	4.54	8.69	11.72
Dividend per Share (THB)	3.00	3.25	4.25	5.00	6.00
Dividend Payout Ratio	N/A**	98%	90%	55%	49%

* 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.

** Dividend Payout Ratio of 2015 is not available due to net loss.

8. Management Structure

As of January 1, 2020



8.1 The Board of Directors

8.1.1 The Board's Structure

PTTEP's Board of Directors (Board) consists of qualified directors who possess a versatility of expertise with an appropriate mix of skills suitable for the E&P industry. In 2019, PTTEP reviewed the Board's Skill Mix to reflect company's strategic direction by classifying it to 12 subject matters under two categories.

(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, 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 absent from Board meetings for more than three consecutive times without reasonable justification.

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 comprise independent directors numbering not less than half of the incumbent members. As of December 31, 2019, the Board consisted of 15 directors including:

- 14 non-executive directors (93.33% of total members)
- 1 executive director: the President and Chief Executive Officer (CEO)
- 8 independent directors (53.33% 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 aforementioned Board's composition and proportion are therefore considered appropriate to maintain 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 in the "Information of the Board of Directors, Management, Controlling Persons and Company Secretary" section as well as in PTTEP's annual report and website.

8.1.2 Authorities 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 scope 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 by having 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, an 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 President and 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.

8.1.3 Sub-Committees

8.1.3.1 Corporate Governance Committee

The Corporate Governance Committee has the duties and responsibilities according to its charter as follows:

(1) To establish Good Corporate Governance and Business Ethics of PTTEP Group (CG&BE) for the Board's approval for implementation throughout the organization.

(2) To promote the CG&BE to the Board, management, and employees to ensure that it is complied with in all areas of the Company's business operations.

(3) To review the Business Ethics of the Company as well as policies and practices in regard to the Company's Good Corporate Governance to ensure that they are in line with relevant laws as well as practices of and recommendations from leading international organizations, and review shareholders' proposals on corporate governance before proposing them to the Board for approval and corresponding them with the shareholders.

(4) To ensure that PTTEP carries out an assessment of the Company's compliance with the CG&BE.

(5) To disclose information in regard to the Company's Good Corporate Governance to our stakeholders in the Company's annual report.

(6) To oversee and provide recommendations on the Corporate Social Responsibility (CSR) activities.

(7) To regularly review and update its own charter to ensure appropriateness.

(8) To disclose performance of the Corporate Governance Committee in the Company's annual report.

(9) To perform other duties relevant to the Good Corporate Governance of the PTTEP Group as assigned by the Board.

The Corporate Governance 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, 2019, the Committee comprised three members as follows:

Admiral Tanarat Ubol	Chairman of the Committee and Vice Chairman of the Independent Directors Committee
Mr. Pitipan Teparitarn	Member
Mrs. Angkarat Priebjivat	Member and Independent Director

Mrs. Angkarat Priebjivat was appointed as a member of the Committee in place of Ms. Panada Kanokwat on October 1, 2019.

According to its charter, the Committee must meet at least four times a year. In 2019, the Committee held five meetings, attended by all incumbent directors. The Committee disclosed its annual performance in the Corporate Governance Committee Report for 2019.

8.1.3.2 Audit Committee

The Audit Committee has the duties and responsibilities according to its charter as follows:

- (1) To establish the audit committee charter compatible with the Company's scope of work and responsibilities. The charter 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 to ensure that the process is appropriate and efficient 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 the risk-based internal audit plan.

(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 Conflict of Interest Declaration Form when the Head of the Internal Audit Division has to personally conduct audit field work.

(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. As of December 31, 2019, the Committee comprised four members, and all members were capable with knowledge, expertise, and experience in auditing financial statements. One of the members, Mrs. Angkarat Priebjivat, holds a degree in accounting. Details are as follows:

Director's Name	Position	Financial Statements Audit Experience
Mr. Achporn Charuchinda	Chairman of the Audit Committee	<ul style="list-style-type: none"> • 2013 - 2017 Board Member, The Bank of Thailand • 2013 - 2016 Director, Thai Smile Airways Co., Ltd. • 2013 - 2014 Member of the Audit Committee, Metropolitan Waterworks Authority • 2007 - 2013 Chairman of the Audit Committee, Bank of Thailand's Financial Institutions Development Funds

Director's Name	Position	Financial Statements Audit Experience
Mr. Sethaput Suthiwart-Narueput	Member of the Audit Committee	<ul style="list-style-type: none"> • 2017 - Present Member of the Board of Directors, The Bank of Thailand Board • 2016 - Present Director, Osotspa Plc. • 2011 - 2012 Member of the Audit Committee, TMB Bank Plc. <p>Experiences in financial statements analysis for investment:</p> <ul style="list-style-type: none"> (1) 2008 - 2009 President, SCB Asset Management Co., Ltd. (2) 2007 - 2008 Managing Director, Head of Research, SCB Securities Co., Ltd.
Mr. Dechapiwat Na Songkhla	Member of the Audit Committee	<ul style="list-style-type: none"> • 2017 - Present 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 Priebjrivat	Member of the Audit Committee	<ul style="list-style-type: none"> • 2018 – Present Member of the Audit Committee, TOT Corporation Plc. • 2018 – Present Member of the Technical Advisory Committee for Financial Reporting Standards, Office of the Securities and Exchange Commission • 2018 – Sep 2019 Member of the Finance and Accounting Subcommittee, State Railway of Thailand • 2016 – Present Member of the Audit Committee, TSFC Securities Plc. • 2013 – Present Chairman of the Audit Committee, TISCO Bank Plc. • 2012 – Present Member of the Audit Committee, Thai Public Broadcasting Service (Thai PBS) • 2008 – Present Chairman of the Audit Committee, TISCO Financial Group Plc. • 2008 – Present Chairman of the Audit Committee, COL Plc. • 2014 – 2018 Member of the Audit Committee, Tourism Authority of Thailand

Mrs. Angkarat Priebjriwat was appointed as a member of the Committee in place of Ms. Panada Kanokwat on October 1, 2019.

According to the Audit Committee Charter, the Committee must hold at least one meeting on a quarterly basis. In 2019, the Committee held 15 meetings which included a meeting that was conducted together with the Risk Management Committee. The Committee also considered the reviewed financial statements for the second and third quarter without physical meeting, since the financial statements had not changed from the unreviewed version. The majority of incumbent directors attended all meetings. The Committee disclosed its annual performance in the Audit Committee Report for 2019.

8.1.3.3 Nominating Committee

The Nominating 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, the President and 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 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 regularly review and update its own charter to ensure its appropriateness.

(8) To disclose performance of the Committee in the Company's annual report.

(9) To perform other duties relevant to the nomination of directors, the CEO, or Acting CEO, as assigned by the Board.

The Nominating Committee consists of at least three directors, and 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, 2019, the Committee comprised four members with three independent directors as follows:

Mr. Bundhit Eua-arporn	Chairman and Independent Director
Major General Nimit Suwannarat	Member and Independent Director
Mr. Sethaput Suthiwart-Narueput	Member and Independent Director
Mr. Pitipan Teparimargorn	Member

Mr. Pitipan Teparimargorn was appointed as a member of the Committee on October 30, 2019.

According to its charter, the Committee must meet at least two times a year. In 2019, the Committee held eight meetings, and the majority of incumbent directors attended all meetings. The Committee disclosed its annual performance in the Nominating Committee Report for 2019.

8.1.3.4 Remuneration Committee

The Remuneration Committee has the duties and responsibilities according to its charter as follows:

(1) 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.

(2) To consider remuneration of the President and Chief Executive Officer (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.

(3) To evaluate performance of the Remuneration Committee and report it to the Board for annual disclosure to the shareholders.

(4) To regularly review and update the Remuneration Committee Charter to ensure its appropriateness.

(5) To perform other duties as assigned by the Board.

The Remuneration Committee consists of at least three directors, and 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, 2019, the Committee comprised three members, two of whom were independent directors as follows:

Mr. Achporn Charuchinda	Chairman and Independent Director
Admiral Tanarat Ubol	Member and Vice Chairman of the Independent Directors Committee
Mr. Patchara Anuntasilpa	Member

According to its charter, the Committee must meet at least two times a year. In 2019, the Committee held four meetings, and all incumbent directors attended all meetings. The Committee disclosed its annual performance in the Remuneration Committee Report for 2019.

8.1.3.5 Risk Management Committee

The Risk Management Committee has the duties and responsibilities according to its charter as follows:

(1) To define PTTEP's risk management policy and framework, and provide recommendations on corporate risk management to the Board and Management.

(2) To consider risk appetite prior to proposing it to the Board for approval as well as to determine risk metrics and limit and regularly monitor the results.

(3) To oversee and support the implementation of risk management to achieve objectives at both corporate and asset/project levels (Enterprise-Wide Risk Management), with a focus on enhancing the level of risk awareness in order to support the decision-making in using appropriate resources and risk responses.

(4) To consider the entity's corporate risks in line with the corporate direction of the businesses PTTEP invests in, including E&P, related and other businesses, as well as to recommend mitigation strategy to manage the risks to keep them within the acceptable levels according to clause (2) and to continuously monitor, assess and improve the mitigation strategy in response to the changing business environment.

(5) To support the risk management function in assessing key risk factors and provide advice on other potential risks facing the Company for a continuous and efficient risk management comparable to other leading companies as well as to directly assign tasks related to PTTEP's risk management to the risk management function.

(6) To report risk management results to the Board on a regular basis. For any matter with a significant impact on PTTEP, it shall be reported immediately to the Board for consideration.

(7) To disclose the Committee's performance in the Company's annual report.

(8) To regularly review and update its own charter to ensure its appropriateness.

(9) To perform other duties relating to PTTEP's risk management as assigned by the Board.

The Risk Management Committee consists of at least three directors, while at least one member must be an independent director. The Head of the Risk Management Unit acts as the Committee's secretary. As of December 31, 2019, the Committee comprised six members, two of which were independent directors as follows:

Mr. Sethaput Suthiwart-Narueput	Chairman and Independent Director
Major General Nimit Suwannarat	Member and Independent Director
Mr. Pitipan Teparitimgorn	Member
Mr. Twarath Sutabutr	Member
Ms. Penchun Jarikasem	Member
Mr. Atikom Terbsiri	Member

Mr. Atikom Terbsiri assumed the membership in place of Mr. Wirat Uanarumit on October 1, 2019.

According to its charter, the Committee must hold at least four meetings a year. In 2019, the Committee held 14 meetings, which included one meeting that was conducted together with the Audit Committee. The majority of incumbent directors attended all meetings. The Committee disclosed its annual performance in the Risk Management Committee Report for 2019.

8.1.3.6 Independent Directors Committee

The Independent Directors Committee has the duties and responsibilities according to its charter as follows:

- (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.

The directors 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, 2019, the Committee comprised eight members as follows:

Mr. Prajya Phinyawat	Chairman
Admiral Tanarat Ubol	Vice Chairman
Mr. Achporn Charuchinda	Member
Major General Nimit Suwannarat	Member
Mr. Sethaput Suthiwart-Narueput	Member
Mr. Bundhit Eua-Arporn	Member
Mr. Dechapiwat Na Songkhla	Member
Mrs. Angkarat Priebjrivat	Member

According to its charter, the Committee must meet at least four times a year with the Company Secretary serves as the Committee's secretary. In 2019, the Committee held four 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 2019.

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, 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 two 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. For example, 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 twenty million baht 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 two million baht 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 one percent 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, the major shareholders or any shareholders who are related to the major shareholders.

(9) Not having any other characteristics which deprive 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 for the Company during the Past Fiscal Year

– None –

8.1.4 Performance Appraisal of the Board

The Good Corporate Governance and Business Ethics of PTTEP Group (CG&BE) stipulates that there should be an annual performance appraisal of the Board derived from the Board Performance Target and the 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 comprises:

(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 six evaluation topics, namely (1) corporate policies and strategic planning, (2) Board performance, (3) management governance and relationship, (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 individual charters.

(4) Appraisal of the Chairman, which includes questions on 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 2019, Board Performance Target was established, encompassing three aspects, namely the Company's performance results, the Corporate Governance assessment results and directors' meeting attendances. The performance appraisal form was also reviewed according to the SEC's CG Code. The 2019 performance appraisal form included four parts as aforementioned with a scoring scale of 1 to 3 (1=need improvement, 2=meet standard, and 3=good). The scoring scale of the appraisal of the entire Board was adjusted by increasing the scoring scale of the two topics on corporate policies and strategic planning and Board performance from 20% to 30% and decreased the remaining topics to 10% to reflect performance of the Board with a focus on setting corporate policies and strategic planning, and roles and responsibilities as directors and members of sub-committees.

The questions were also adjusted as follows: 1) Training and Self-development Appraisal – adjusted a question to cover broader aspects of learning and self-development, 2) The Corporate Governance Committee Appraisal – added a question on providing constructive suggestions to promote the PTTEP Group's Corporate Governance and Sustainable Development and 3) The Risk Management Committee Appraisal - adjusted a question to focus on monitoring the performance of new assets to ensure its achievements as planned.

Details of the 2019 Board performance appraisal can be summarized as follows:

(1) The self-appraisal average score was 2.88, increasing from 2.84 in 2018 (total score = 3). The individual cross-appraisal by other directors average score was 2.91, decreasing from 2.92 in 2018 (total score = 3).

(2) The average scores from the self-appraisal of the entire Board was 2.93, increased from 2.92 in 2018 (total score=3).

In addition, the 2019 self-appraisal of the entire Board included an assessment part on the relationship between the Board and management. This was also evaluated by the same set of questions to further develop their relationships and to promote two-way communication.

(3) The 2019 appraisal scores of the five sub-committees were within the "good" range as follows:

(3.1) The appraisal score of the Audit Committee was 3.00, same as 2018 (total score = 3).

(3.2) The appraisal score of the Remuneration Committee was 2.92, same as 2018 (total score=3).

(3.3) The appraisal score of the Nominating Committee was 2.97, increasing from 2.94 in 2018 (total score=3).

(3.4) The appraisal score of the Corporate Governance Committee was 2.89, increasing from 2.87 in 2018 (total score=3).

(3.5) The appraisal score of the Risk Management Committee was 3.00, increasing from 2.98 in 2018 (total score=3).

(4) The 2019 appraisal of the Chairman by the Board was 2.98, same as 2018 (total score=3).

PTTEP reports the scores to the Board for acknowledgement. Recommendations from the Board's appraisal will then be used in the future for efficiency improvement of the Board, sub-committees, Chairman, and management in several aspects, such as time management in Board meetings, review of human resource management, and succession plan development for critical positions. The directors will also put more emphasis on self-development by attending applicable training and studying business trends and technologies from seminars and business visits in order to enhance the Board's performance efficiency and initiation to further promote the Company's long-term sustainable growth.

8.1.5 Performance Appraisal of the President and Chief Executive Officer

The Board assigned the Remuneration Committee to be responsible for conducting the President and Chief Executive Officer (CEO)'s performance appraisal according to the CEO's Performance Agreement as determined by the Nominating Committee. The appraisal was measured by the Company's 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 helps promoting the Company's Good Corporate Governance and greater operational efficiency in the future.

8.1.6 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 normally 12 meetings annually on the last Thursday of every month. The Board members have been informed of the 2020 meeting schedule since September 2019. 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 2019, there were 20 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 for five 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 is clearly classified, including monthly items of performance review as well as budget execution. The standing agenda items are as follows:

Month	Standing Agenda Items
January	<ul style="list-style-type: none"> ● Annual General Shareholders' Meeting Documents Preparation, namely:

Month	Standing Agenda Items
	(1) Unaudited Annual Financial Statements (2) Dividend Payment (3) Auditor Appointment and Auditor's Fees (4) Board of Directors' and Sub-committees' Remuneration ● PTTEP's Board Performance Target
February	● Annual Registration Statement and Annual Report
March	● Annual General Shareholders' Meeting Preparation
April	● Appointment of Sub-committee Members ● Assessment of the Annual General Shareholders' Meeting
May	● Strategic Direction and Annual Strategic Planning
July	● Interim Dividend Payment (if any)
September	● Board Meeting Schedule
November	● Business Plan, 5-Year Investment Plan, and Annual Budgeting ● Corporate Key Performance Indicators (KPIs) and CEO's Performance Agreement ● Annual Procurement Plan
December	● Annual Performance Appraisal of the Board of Directors, Sub-committees, and the Chairman ● Corporate Performance and Budget for Employees' Merit Increase and Annual Special Payment

During each of the meetings, which usually lasts approximately three to four hours, the Chairman allocates an adequate period of 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 and provide advice to the Board on related rules and regulations for proper practices, to take minutes of the meetings, as well as to 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 the particular 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-fourth 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 an 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, names of the meetings' attendants, and names of those who state his or her opinions, questions, answers, or clarifications are recorded in detail, while the minutes are systematically filed and kept safety. All directors of the Board usually attend all of the meetings 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 of the Board members prior to the meeting and will be subsequently recorded in the report of individual directors' meeting attendance.

In 2019, non-executive directors held two meetings in the absence of the management. The purpose of the meetings was to discuss and clarify ongoing issues from corporate performance of 2019. The results were summarized for and acknowledged by the CEO for further evaluation.

8.1.7 Meeting Attendance of PTTEP Directors in 2019

Director's Name	Board of Directors	Independent Directors Committee	Non-Executive Directors Committee	Corporate Governance Committee	Audit Committee	Remuneration Committee	Nominating Committee	Risk Management Committee	Annual General Shareholders' Meeting 2019
	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:	Total number of meetings:
	20 Times	4 Times	2 Times	5 Times	15 Times	4 Times	8 Times	14 Times	1 Time
1. Mr. Prajya Phinyawat	20/20	4/4	2/2	-	-	-	-	-	1/1
2. Mr. Achporn Charuchinda	20/20	4/4	2/2	-	15/15	4/4	-	-	1/1
3. Admiral Tanarat Ubol	20/20	4/4	2/2	5/5	-	4/4	-	-	1/1
4. Mr. Sethaput Suthiwart-Narueput	19/20	4/4	2/2	-	14/15	-	8/8	14/14	1/1
5. Major General Nimit Suwannarat	13/20	4/4	1/2	-	-	-	8/8	12/14	1/1
6. Mr. Twarath Sutabutr	18/20	-	2/2	-	-	-	-	13/14	1/1
7. Mr. Pitipan Teparimargorn	20/20	-	2/2	5/5	-	-	1/1	14/14	1/1
8. Mr. Bundhit Eua-arporn	18/20	3/4	2/2	-	-	-	8/8	-	1/1
9. Ms. Penchun Jarikasem	20/20	-	2/2	-	-	-	-	13/14	1/1
10. Mr. Chansin Treenuchagron	15/20	-	2/2	-	-	-	-	-	1/1

Director's Name	Board of Directors	Independent Directors Committee	Non-Executive Directors Committee	Corporate Governance Committee	Audit Committee	Remuneration Committee	Nominating Committee	Risk Management Committee	Annual General Shareholders' Meeting 2019
	Total number of meetings: 20 Times	Total number of meetings: 4 Times	Total number of meetings: 2 Times	Total number of meetings: 5 Times	Total number of meetings: 15 Times	Total number of meetings: 4 Times	Total number of meetings: 8 Times	Total number of meetings: 14 Times	Total number of meetings: 1 Time
11. Mr. Patchara Anuntasilpa	19/20	-	2/2	-	-	3/4	-	-	1/1
12. Mr. Dechapiwat Na Songkhla ¹	11/19	3/4	1/2	-	9/15	-	-	-	1/1
13. Mr. Atikom Terbsiri ²	4/4	-	-	-	-	-	-	3/4	-
14. Mrs. Angkarat Priebjivat ³	4/4	2/2	-	2/2	4/4	-	-	-	-
15. Mr. Phongsthorn Thavisin	20/20	-	-	-	-	-	-	-	1/1
Former Directors Retiring by Rotation or Resigning During 2019									
1. Mr. Wirat Uanarumit ⁴	15/15	-	2/2	-	-	-	-	8/9	1/1
2. Ms. Panada Kanokwat ⁵	11/11	2/2	1/1	3/3	8/8	-	-	-	1/1

¹ Mr. Dechapiwat Na Songkhla was elected as a director and appointed as a member of Audit Committee on January 16, 2019.

² Mr. Atikom Terbsiri was elected as a director and appointed as a member of Risk Management Committee on October 1, 2019.

³ Mrs. Angkarat Priebjivat was elected as a director and appointed as a member of Audit Committee and Corporate Governance Committee on October 1, 2019.

⁴ Mr. Wirat Uanarumit resigned from the positions of director and member of Risk Management Committee on September 1, 2019, and the number of ordinary shares indicated above was the information as at the effective resignation date.

⁵ Ms. Panada Kanokwat resigned from the positions of independent director, member of Audit Committee and Corporate Governance Committee on July 7, 2019, and the number of ordinary shares indicated above was the information as at the effective resignation date.

8.1.8 Number of PTTEP Shares held by the Directors, their Spouse/Cohabiting Couple and Minor Child as of December 31, 2019

Director's Name	Number of Ordinary Shares		
	As of December 31, 2018	As of December 31, 2019	Increase / (Decrease) During the Year
1. Mr. Prajya Phinyawat	15,000	15,000	-
2. Mr. Achporn Charuchinda	-	-	-
3. Admiral Tanarat Ubol	-	-	-
4. Mr. Sethaput Suthiwart-Narueput	-	-	-
5. Major General Nimit Suwannarat	-	-	-
6. Mr. Twarath Sutabutr	-	-	-
7. Mr. Pitipan Teparimargorn	-	-	-
8. Mr. Bundhit Eua-arporn	-	-	-
Spouse/Cohabiting Couple	4,587	4,587	-
9. Ms. PENCHUN Jarikasem	10,000	10,000	-
10. Mr. Chansin Treenuchagron	-	-	-
11. Mr. Patchara Anuntasilpa	-	-	-
12. Mr. Dechapiwat Na Songkhla ¹	N/A	-	N/A
13. Mr. Atikom Terbsiri ²	N/A	-	N/A
14. Mrs. Angkarat Priebjivat ³	N/A	-	N/A
15. Mr. Phongsthorn Thavisin	81,037	101,037	20,000
Former Directors Retiring by Rotation or Resigning During 2019			
1. Mr. Wirat Uanarumit ⁴	-	-	-
2. Ms. Panada Kanokwat ⁵	30,000	30,000	-

¹ Mr. Dechapiwat Na Songkhla was elected as a director and appointed as a member of Audit Committee on January 16, 2019.

² Mr. Atikom Terbsiri was elected as a director and appointed as a member of Risk Management Committee on October 1, 2019.

³ Mrs. Angkarat Priebjivat was elected as a director and appointed as a member of Audit Committee and Corporate Governance Committee on October 1, 2019.

⁴ Mr. Wirat Uanarumit resigned from the position of director and member of Risk Management Committee on September 1, 2019, and the number of ordinary shares indicated above was the information as at the effective resignation date.

⁵ Ms. Panada Kanokwat resigned from the positions of independent director, member of Audit Committee and Corporate Governance Committee on July 7, 2019, and the number of ordinary shares indicated above was the information as at the effective resignation date.

8.2 The Management

As of January 1, 2020, PTTEP's management, according to the definition of management as defined by the Capital Market Supervisory Board (CMSB), consists of 19 members. Details of their biography, qualification, and past experience are disclosed in 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.

Name	Number of Ordinary Shares		
	As of January 1, 2019	As of January 1, 2020	Increase/(Decrease) During the Year
1. Mr. Phongsthorn Thavisin ¹	81,037	101,037	20,000
2. Mr. Montri Rawanchaikul ²	19,550	32,050	12,500
3. Mr. Vuthiphon Thuampoomngam ³	60,050	15,650	(44,400)
4. Mr. Kanok Intharawijitr	40,231	41,531	1,300
5. Mr. Chayong Borisuitsawat ⁴	55,096	55,096	-
6. Mr. Sumrid Sumneing	2,500	7,000	4,500
7. Mrs. Suchitra Suwansinpan	106,465	106,465	-
Spouse/Cohabiting Couple	300	300	-
8. Mr. Yongyos Krongphanich	106,445	106,445	-
9. Mrs. Natruedee Khositaphai ⁵	107,457	107,457	-
Spouse/Cohabiting Couple	10,000	10,000	-
10. Mr. Suksant Ongvises ⁶	27,681	27,681	-
11. Ms. Jaroonsri Wankertphon	73,228	73,228	-
12. Mrs. Chanamas Sasnanand	45,411	45,411	-
13. Mrs. Netrsuda Pokkasorn	86,005	66,005	(20,000)
14. Mr. Anutra Bunnag	-	-	-
15. Ms. Pratamaporn Deesrinthum	53,249	53,249	-
16. Mr. Serssak Satchawannakul	45,215	45,215	-

¹ Appointed as Chief Executive Officer and Acting President, Exploration and Production on October 1, 2018. Since January 1, 2019, the work scope of President, Exploration and Production was combined with Chief Executive Officer and the title was renamed to President and Chief Executive Officer.

² Appointed as Executive Vice President, Production Asset Group effective from January 1, 2020.

³ Appointed as Executive Vice President, Human Resources, Assurance and Transformation Group effective on January 1, 2020.

⁴ Appointed as Executive Vice President, Engineering and Development Group effective on January 1, 2020.

⁵ Appointed as Executive Vice President, Strategy and Business Development Group effective on January 1, 2020.

⁶ Appointed as Executive Vice President, Operations Support Group effective on January 1, 2020.

Name	Number of Ordinary Shares		
	As of January 1, 2019	As of January 1, 2020	Increase/(Decrease) During the Year
17. Mrs. Monsalai Tongsari ⁷	N/A	100,480	N/A
18. Ms. Nuchanong Sangkeaw ⁸	N/A	4,605	N/A
19. Mrs. Yada Vudhivorn ⁹	N/A	50	N/A
Management Who Retired or Rotated During 2019			
1. Ms. Kanchanan Panananda ¹⁰	56,604	56,604	-
2. Mrs. Maneeya Srisukhumbowornchai ¹¹	-	-	-
3. Mr. Chatchawal Eimsiri ¹²	40,078	19,287	(20,800)

8.3 Secretary to the Board of Directors and Company Secretary

8.3.1 Secretary to the Board of Directors

The Board of Directors resolved to appoint Mrs. Pranot Tirasai, Former Executive Vice President, attached to the President and Chief Executive Officer, and assigned as Secretary to the Board of Directors, effective from October 1, 2018. The Secretary of the Board of Directors serves as the focal point for 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 accountable 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 making 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 of its fiduciary duties.

8.3.2 Company Secretary

The Board of Directors resolved to appoint Mrs. Maneeya Srisukhumbowornchai, Acting Senior Vice President, Corporate Secretary Division, as the Company Secretary and the Corporate Governance Committee's secretary, the Nominating Committee's secretary, the Remuneration Committee's secretary, and the Independent Directors Committee's secretary since September 1, 2019. Mrs. Maneeya holds a degree in accounting. She is highly knowledgeable, capable and experienced in

⁷ Appointed as Vice President, Accounting Policy and Solutions Department, Accounting Division, Finance and Accounting Group effective on July 1, 2019.

⁸ Appointed as Acting Vice President, Capital and Investor Relations Department, Finance Division, Finance and Accounting Group effective on July 11, 2019. The position title was changed to Acting Vice President, Capital Market and Financial Planning Department, Finance Division, Finance and Accounting Group on 1 January 2020.

⁹ Appointed as Acting Vice President, Tax Department, Accounting Division, Finance and Accounting Group effective on September 1, 2019.

¹⁰ Retired from the position of Vice President, Capital and Investor Relations Department, Finance Division, Finance and Accounting Group from July 11, 2019.

¹¹ Retired from the position of Vice President, Tax Department, Accounting Division, Finance and Accounting Group from September 1, 2019.

¹² Retired from the position of Executive Vice President, attached to President and Chief Executive Officer from December 31, 2019

corporate secretarial functions. In addition, she attended seminars and completed trainings which were beneficial to her performance. Details of the Company Secretary are disclosed in the “Information of the Board of Directors, Management, Controlling Persons, and Company Secretary”.

The Company Secretary has performed roles with fiduciary duties by having responsibility, and duties of care and loyalty, 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 advices 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 and with external regulatory bodies overseeing 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 PTTEP Group, which is regularly being revised to be in compliance 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 relationship with minority shareholders.
- Acting as a focal point, which is responsible for managing reports or complaints submitted through the Whistleblowing System of PTTEP Group.
- Performing other duties as required by the Company.

8.4 Remuneration of Directors and Executives

8.4.1 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 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 2019 Annual General Shareholders' Meeting (AGM) approved the following remunerations for members of the Board and sub-committees, as proposed by the 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 -

Remuneration of Members of the Board and Sub-Committees in 2019.

Director's Name		Remuneration							2019 Bonus Paid in 2020	Total
		Board of Directors		Audit Committee	Corporate Governance Committee	Remuneration Committee	Nominating Committee	Risk Management Committee		
		Monthly Allowance	Meeting Allowance	Meeting Allowance	Meeting Allowance	Meeting Allowance	Meeting Allowance	Meeting Allowance		
1. Mr. Prajya	Phinyawat	600,000	1,250,000	-	-	-	-	-	4,918,033	6,768,033
2. Mr. Achporn	Charuchinda	480,000	1,000,000	843,750	-	225,000	-	-	3,934,426	6,483,176
3. Admiral Tanarat	Ubol	480,000	1,000,000	-	281,250	180,000	-	-	3,934,426	5,875,676
4. Mr. Sethaput	Suthiwart-Narueput	480,000	950,000	585,000	-	-	360,000	787,500	3,934,426	7,096,926
5. Major General Nimit	Suwanarat	480,000	650,000	-	-	-	360,000	540,000	3,934,426	5,964,426
6. Mr. Twarath	Sutabutr	480,000	900,000	-	-	-	-	585,000	3,934,426	5,899,426
7. Mr. Pitipan	Tepartimargorn	480,000	1,000,000	-	225,000	-	45,000	630,000	3,934,426	6,314,426
8. Mr. Bundhit	Eua-arporn	480,000	900,000	-	-	-	450,000	-	3,934,426	5,764,426
9. Ms. Penchun	Jarikasem	480,000	1,000,000	-	-	-	-	585,000	3,934,426	5,999,426
10. Mr. Chansin	Treenuchagron	480,000	750,000	-	-	-	-	-	3,934,426	5,164,426
11. Mr. Patchara	Anuntasilpa	480,000	950,000	-	-	135,000	-	-	3,934,426	5,499,426
12. Mr. Dechapiwat	Na Songkhla	480,000	550,000	405,000	-	-	-	-	3,772,737	5,207,737
13. Mr. Atikom	Terbsiri	120,000	200,000	-	-	-	-	135,000	991,691	1,446,691
14. Mrs. Angkarat	Priebjivat	120,000	200,000	180,000	90,000	-	-	-	991,691	1,581,691
15. Mr. Phongsthorn	Thavisin	480,000	1,000,000	-	-	-	-	-	3,934,426	5,414,426

Director's Name	Remuneration							2019 Bonus Paid in 2020	Total	
	Board of Directors		Audit Committee	Corporate Governance Committee	Remuneration Committee	Nominating Committee	Risk Management Committee			
	Monthly Allowance	Meeting Allowance	Meeting Allowance	Meeting Allowance	Meeting Allowance	Meeting Allowance	Meeting Allowance			
Former Directors Retiring by Rotation or Resigning During 2019										
1. Mr. Wirat	Uanarumit	320,000	750,000	-	-	-	-	360000	2,619,358	4,049,358
2. Ms. Panada	Kanokwat	280,000	550,000	360000	135000	-	-	-	2,015,720	3,340,720
Total		7,200,000	13,600,000	2,373,750	731,250	540,000	1,215,000	3,622,500	58,587,916	87,870,416

Remarks:

- (1) The 2019 Annual General Shareholders' Meeting (AGM) approved bonus for the Board if there is dividend payment 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.
- (2) Mr. Chansin Treenuchagron have returned their PTTEP directorship remuneration in 2019 to PTT Public Company Limited (PTT) according to PTT's President and Chief Executive Officer management contract.
- (3) PTTEP provides the Chairman with a corporate car to carry out corporate-related purposes while in the chairmanship.

8.4.2 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 in order to optimize the Company's benefits, taking into account of 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 had 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 the 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.

8.4.3 Remuneration of the President and Chief Executive Officer

Remuneration of the President and Chief Executive Officer (CEO) is determined using fair and appropriate procedures and defined under the principles which are unbiased, reasonable, justifiable, and transparent. The 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 comparing to the average annual compensation of the Company's executives is approximately 1.5 : 1, while the ratio of annual compensation of the CEO comparing to the average annual compensation of the Company's employees is approximately 10 : 1.

8.4.4 Remuneration of the Executives

The Remuneration Committee is responsible for the salary structure of the Company's executives. The key principles are 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 companies in the industry. The Board must give an approval to the structure prior to the implementation.

The President and 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 7.4 : 1.

Remuneration of the Executives

	2018		2019	
	Number	Total Amount (THB)	Number	Total Amount (THB)
Salary	16 ¹	105,475,290	11 ¹	98,178,140
Bonus		75,388,087 ²		67,328,586 ³
Other compensation ⁴		14,474,373		13,481,237
Total		195,337,750		178,987,963

In 2019, compensation (salary, bonus, and contribution to the provident fund) of PTTEP's and the subsidiaries' employees, including wages of the seconded employees, totaled THB 9,942,200,332.

8.5 Personnel

As of December 31, 2019, PTTEP and our subsidiaries had a total workforce of 4,449 employees.

Number of Employees¹

Employee Type	Total (Persons)
Thai Permanent Employees	2,077
Thai Contracted Employees	1,292
Non-Thai Contracted Employees	77
Local Employees in Overseas Subsidiaries	998
Seconded Employees from PTT Group Companies and Joint Venture Partners	5
Total	4,449

Remarks: ¹ Based on the Company's database as of December 31, 2019

The list is exclusive of outsourced staff hired through services contracts e.g. maid, drivers, etc. and third-party service providers.

¹ Executives consisted of the President and Chief Executive Officer, Executive Vice Presidents and equivalent, and PTT's executives who have been seconded to PTTEP.

² Bonus for 2018 was paid in January and February 2019.

³ Bonus for 2019 was paid in January 2020.

⁴ Provident Fund

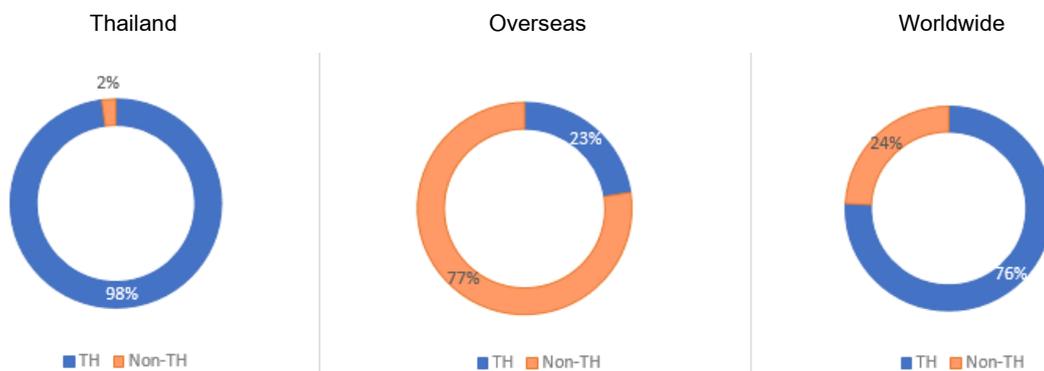
Number of Employees in Each Function Group¹

Function Group ²	Thai Permanent Employee	Thai Contracted Employee	Non-Thai Contracted Employee	Local Employee	Seconded Employee
President and Chief Executive Officer	54	8	2	2	-
Business and Organization Transformation Group	72	54	2	1	-
Corporate Affairs and Assurance Group	91	27	-	1	-
Engineering, Development and Operations Group	373	265	15	35	-
Finance and Accounting Group	146	128	-	-	-
Geosciences, Subsurface and Exploration Group	227	47	21	8	-
Production Asset and Supply Chain Management Group	948	701	34	948	5
Strategy and Business Development Group	79	10	2	1	-
Internal Audit Division	13	1	-	-	-
Safety, Security, Health, and Environment Division	3	9	-	-	-
Human Resources Division	71	42	1	2	-
Total	2077	1292	77	998	5

Remarks: ¹ Based on the Company's database as of December 31, 2019.

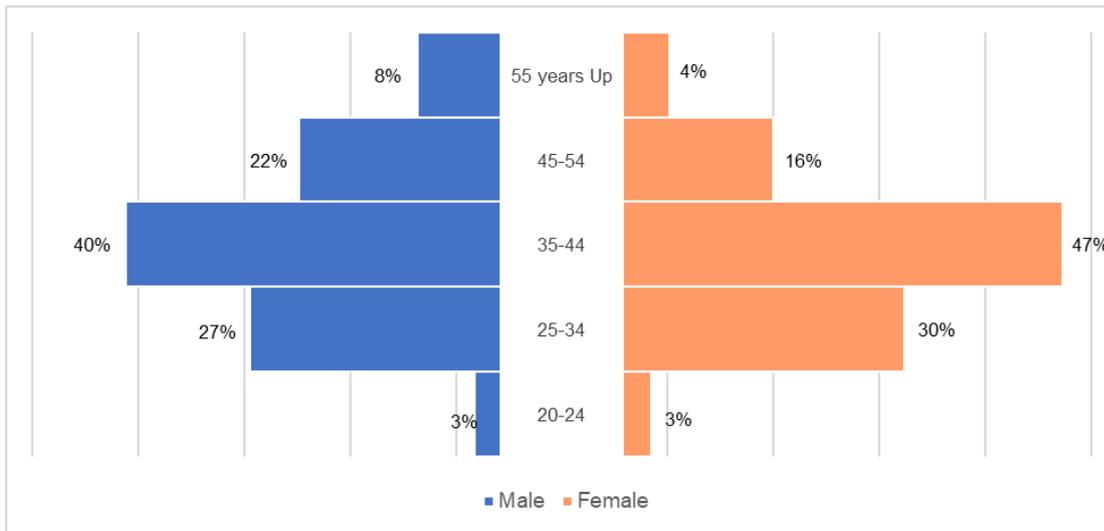
² Based on the Company's organization structure as of December 31, 2019.

The list is exclusive of outsourced staff hired through services contracts e.g. maid, drivers, etc. and third-party service providers.

 Staff Demography by Nationality and Work Location¹


Remarks: ¹ Based on the Company's database as of December 31, 2019.

Staff Demography by Gender and Age¹



Remarks: ¹ Based on the Company's database as of December 31, 2019.

Employee Turnover

	IN ¹	OUT ¹
Thai Permanent Employees	55	34
Thai Contracted Employees ²	81	53
Non-Thai Contracted Employees	7	10
National Employees	127	68
Seconded Employees	0	0

Remarks: ¹ Based on the Company's database as of December 31, 2019.

² The turnover was exclusive of outsourced staff hired through services contracts e.g. maid, drivers, and third party service providers. M&A and Divestment conditions are excluded.

In 2019, the Company's total employee turnover rate¹ was 3.7%, while the voluntary resignation rates in 2015 through 2019 were as shown below.

Voluntary Turnover Rate

2015	2016 ²	2017 ²	2018	2019
6.3%	5.9 %	3.9 %	3.7%	2.5%

Remarks: ¹ Including voluntary resignation, dismissal, early retirement, retirement, death

² Resignation and early retirement in 2016, 2017
M&A and Divestment conditions are excluded.

8.5.1 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 2019, 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 computer skills, foreign language, business administration, and leadership skills. Moreover, in 2019 PTTEP has continuously been implementing the staff development program to support transformation towards digital organization, changing the way of working to be more agile, more efficient, faster, and exploring for new business opportunities in preparation for future growth. Examples of the program included the new learning and development programs for executives, promotion of four core behaviors, digital literacy, and agile way of working.

(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 the 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

In 2019, the Company invested in human capital development programs at the total amount of THB 267,478,109 and provided more than 190,000 training and development hours for our employees with the average of 43 training and development hours per person per annum. 100% of employees took development actions to fulfil their Individual Competency Development Plan (ICDP). As a result, our employees' competency increased by approximately 4.15% which was higher than the set target of 3%.

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 a 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.

9. Corporate Governance

9.1 Good Corporate Governance Policy

PTTEP's Board of Directors (Board) recognizes how crucially significant it is to successfully implement Good Corporate Governance and Business Ethics of PTTEP Group (CG&BE). The Board is confident that strict adherence to CG&BE will successfully lead the Company to achieving its goals of "Growth, Prosperity, Stability, Sustainability and Dignity" as well as to enhancing the confidence of our shareholders and other stakeholders. The Board has assigned the Corporate Governance Committee to oversee, supervise, and monitor implementation of the necessary measures (CG&BE Program) to assure that the Company's operations are in line with the CG&BE Principles and that good corporate governance is maintained at the level of international standards. Also, compliance to CG&BE is periodically monitored to ensure that CG&BE has been integrated into everyone's work. In 2019 the Board of Directors paid keen attention to the expansion in corporate governance to embrace new investment projects acquired by PTTEP. A plan was made with the Transition Team, a work plan was spelled out, and progress was to be regularly updated for the Board. A strategic plan with long-term sustainable development goals was submitted to the Board, the outcomes of which were also regularly updated. Thanks to its commitment to ongoing development of corporate governance, PTTEP's Board of Directors won the Board of the Year Award 2018 (Silver) for listed companies with over THB 100 billion in market capitalization, presented by the Thai Institute of Directors. As a result, the Company earned various recognitions for our good corporate governance, domestically and internationally. Details are disclosed in the "Awards and Recognitions for Good Corporate Governance" section.

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 fully understands the CG Code's leadership role and the overall usefulness in business applications. The Board assigned the Corporate Governance 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:

9.1.1 Shareholders' Rights and Equal Treatments

PTTEP's understanding of the importance of shareholders' rights and equal treatment has given rise to the enactment of the Company's Good Corporate Governance principles. They include a number of guidelines to assure the Company's shareholders of their basic rights which, among others, allow them to trade and transfer shares, declare share ownership, and attend shareholders' meetings in person or through their proxies. In addition, the shareholders and their proxies are allowed to participate and vote on significant issues at the Company's shareholders' meetings. These issues could be, for example, election of new members of the Board to replace those due to retire by rotation, determination of the Board's remuneration in all forms, appointment and approval of the external auditor and the auditor's fees, approval of connected transactions, acquisition or disposition of assets which, based on relevant laws, could be sizeable, and other issues which are of significance to the Company. The shareholders are also entitled to profit sharing in the form of dividends as well as to receiving adequate and timely information from the Company. The Company has only one class of shares, namely ordinary shares, where one share is equal to one vote. Our efforts to ensure and enhance the shareholders' rights also include the followings:

(1) **Annual General Meeting of Shareholders:** In 2019, PTTEP respected and promoted shareholders' rights in its Annual General Meeting of Shareholders (to be known hereafter as AGM or the Meeting) through the following actions:

Before the Meeting

(1.1) Shareholders were invited to propose agenda items and nominate qualified candidates for the election of PTTEP directors prior to the AGM from September 14 to December 17, 2018. The criteria were announced publicly through The Stock Exchange of Thailand (SET) and the Company's website. The shareholders' proposals would be considered based on the Company's established criteria to ensure that the proposed agenda items were relevant and truly beneficial to the business. The Nominating Committee was to be responsible for short-listing the nominated candidates for the Board's consideration. Afterwards, the Board would inform the shareholders of the resolution together with the rationale for each of the proposals at the AGM. In 2019, no such agenda or any director candidates were proposed.

(1.2) PTTEP disclosed the AGM date approximately two months prior to the Meeting through the SET and the Company's website. The disclosure was made immediately when the Board determined the date on January 30, 2019. In addition, the Company disclosed the date on which the shareholders would have the right to attend the Meeting as well as to receive dividends (on February 13, 2019).

(1.3) The AGM invitation letter and supplementary documents, in both Thai and English, were published on the Company's website on February 27, 2019, at least 30 days prior to the Meeting. The invitation letter included necessary details of each agenda item, which clearly stated the types of agenda items, be they for acknowledgement or approval. The Board's opinions on each agenda item are clearly stated along with other rules and regulations related to the Meeting. A proxy form, which was stipulated by the Ministry of Commerce, was also enclosed with the invitation letter. A comprehensive list of required documents that the shareholders were required to bring to the Meeting, on the other hand, was provided to preserve their rights to attend, while other enclosures included instructions of the Meeting and a map of the venue. The AGM invitation letter and supplementary documents were distributed to the shareholders by post 21 days prior to the Meeting.

(1.4) PTTEP provided the names of three independent directors in the proxy form to provide the shareholders with 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 retire by rotation, an independent director whose term was completed but re-nominated for another term would be considered as having vested interests (but not a special one). However, on the agenda item to approve remuneration of the Board, all of the directors would be considered as having a special interest and therefore were excluded from the voting regardless of the percentage 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.

(1.5) The Company also invited the shareholders to submit questions related to 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 meeting.

At the Meeting

(1.1) The Meeting was held on March 29, 2019, at 14.00 hrs. at the Bangkok Convention Center, 5th Floor, Central Plaza Ladprao, Bangkok. The meeting date, time, and venue were determined by considering convenience for the shareholders. Barcode and electronic systems were used for the registration, vote counting, compilation, and display of resolutions to ensure that the Meeting was carried out with full efficiency and accuracy. Assistants were adequately arranged to facilitate the process. To accelerate the registration process, the registration was opened to the shareholders four hours prior to the Meeting. The Company also provided duty stamps to the shareholders who intended to vote through proxies.

(1.2) All 15 PTTEP directors attended the Meeting. The Company's Chairman presided over the Meeting, while the sub-committee chairmen, the President and Chief Executive Officer, senior executives from the Finance and Accounting Group, and other function groups also participated to respond and provide clarifications to inquiries from the shareholders. The external auditor, external legal advisors (inspectors) from Weerawong, Chinnavat & Partners Ltd., shareholders' right protection volunteers from the Thai Investors 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 and provided adequate time and opportunities for the shareholders 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 each vote casting and resolution.

(1.3) PTTEP clearly provided information on the number and ratio of the shareholders who attended the Meeting in person and via proxies, including the meeting procedures, vote casting, vote counting before the commencement as stipulated in the Articles of Association. The shareholders and proxies were required to use voting ballots to vote on each agenda item scheduled for the Meeting whether to agree, disagree, or abstain. For each agenda item, a barcode system was used to tally the votes, and each agenda item was treated and voted on separately, to ensure an accurate and effective vote-counting procedure. 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 the vote-tallying and sign off on all the ballot cards collected, counted, and signed. These cards were for the internal reviews that took place after the Meeting had been adjourned.

The Company permitted shareholders who arrived at the Meeting after it had commenced to cast their votes on the agenda item that was in the consideration process or had not been considered or voted on at the time of their arrival. The Company was also to count these shareholders as participants in the Meeting, starting from the agenda item when they registered and entered into the meeting.

(1.4) 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 the shareholders.

(1.5) 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 and meeting procedures informed by the Chairman of the Meeting. Responsibilities of the inspectors included verification of 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 procedure and vote counts were in line with the Articles of Association or as stated by the Chairman of the Meeting. The inspectors were also responsible for ensuring ballot collection from the attending shareholders and auditing of the vote-tallying.

After the Meeting

(1.1) PTTEP disclosed the minutes of the Meeting together with the vote-tallying results for each agenda item to the SET and also on the Company's website immediately after the Meeting.

(1.2) Minutes of the Meeting, in both Thai and English, were accurately and completely recorded. They covered explanations of the Meeting's voting and vote-tallying procedure, details of agenda items, questions, and opinions related to PTTEP's business operations and the Meeting's agenda, as well as clarifications of each agenda item made by the Company's directors and top executives. The Company also recorded the resolution on each agenda item, categorized 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, within 14 days after the Meeting, 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). 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 2019, the Company did not receive any objections or inquiries from the shareholders in regard to vote-tallying results and minutes of meeting. The approved minutes, video and audio clips of the Meeting were also published in both Thai and English on the Company's website.

(2) **Disclosure of Significant Material Information:** PTTEP ensures that information communicated to the shareholders is timely and accurate, 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.

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.

(3) **Fostering Understanding of Business Operations and Long-Term Engagement with Shareholders:** PTTEP continuously organizes various activities for the benefits 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 E&P business which owns special characteristics as well as get to know and participate in our CSR program. Aside, we aim to foster the level of confidence of investors to maintain long-term investment with PTTEP. In 2019, key activities were as follows:

(3.1) The visit to operation sites and CSR projects, provided equal opportunities for all interesting shareholders to participate in such activities.

(3.1.1) PTTEP, on June 12 and 13, 2019, organized activities for 100 shareholders, divided to two groups of 50 people, to visit the PTTEP Petroleum Development Support Base located in Singhanakhon district, Songkhla province and our supported CSR project at the Crab Hatchery Learning Centre at Ban Hua Khao in Singhanakhon district, Songkhla province which is the development model of crab hatchery learning center of the Company.

(3.1.2) PTTEP organized trips to visit our Sirikit Oil Field in Kampheng Phet Province, on November 5, 6, 19 and 20, 2019, for 241 shareholders, divided to 4 groups of about 60 people. The participants of the trips included not only shareholders who had never joined such visits, but also shareholders who previously had joined the visit and were willing to be responsible for the travelling expenses themselves. This is in accordance with the suggestion given by the shareholders at the 2018 Annual General Meeting of Shareholders.

(3.2) PTTEP published a quarterly newsletter to provide an additional means of communication between the Company and the shareholders or investors or any other persons interested in the Company's performance. The newsletter included information on operational performance, progress of key projects, Corporate Social Responsibility (CSR) activities, and corporate governance activities. The Company also published other useful information; for example, the Transformation strategy of PTTEP, the development of technology knowledge by establishing the AI and Robotics Ventures Company Limited, and the whistleblowing as a mechanism to prevent corruption and misconduct in the organization. The quarterly newsletter was publicized on the Company's website as well as sent to the shareholders upon request.

(4) Equal Treatments to Shareholders: PTTEP provides a direct communication channel between our shareholders and independent directors through e-mail at IndependentDirector@pttep.com. The Company's shareholders, for example, are able to access more information from or make inquiries to independent directors in regard to their activities, corporate governance, and audit-related issues. In addition, the shareholders are allowed to 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 a focus on sustainability of the organization, appropriate and consistent returns to the shareholders, and long-term relationships with the stakeholders, ensuring that all are managed and assessed by the use of modern and well-accepted management tools.

(5) Prevention of Insider Trading

PTTEP puts a great emphasis on controlling the use of our internal information by including this matter in the CG&BE. In addition to being in line with securities laws, policies relating to use of internal information are regularly reviewed to preserve the integrity and equality among all of the Company's stakeholders. Key approaches are as follows:

(5.1) The Board of Directors has assigned the Governance, Compliance, and Internal Control 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 management and employees.

(5.2) The directors, management, and employees are always informed of PTTEP's regulations and policies in regard to insider trading prevention through various communication as well as training to ensure that they understand and strictly follow them to prevent them from misusing such information directly or indirectly for his or her personal gain. Disciplinary actions are clearly specified, while the supervisors, who are appointed as the CG leaders, are responsible for advising and encouraging their subordinates to follow suit. In 2019, there was no report of any misuses of internal information.

(5.3) PTTEP requires a group of personnel to abstain from trading the Company's securities during the blackout periods, when material information is being disclosed which may affect the securities price. These are, for example, the release of the Company's financial statements or operating results as well as investment in new projects. The prohibition is announced in advance by the Governance, Compliance and Internal Control Department. These personnel include all directors, Executive Vice Presidents (EVPs), Senior Vice Presidents (SVPs), Vice Presidents (VPs) of the Finance and Accounting Group (FNA) as well as other management and employees bearing material internal information. This prohibition also applies to their spouses and minor children. The individuals are also refrained from directly and indirectly selling and/or buying PTTEP's securities during the periods. Violation of this prohibition is considered a disciplinary offense.

PTTEP also requires all of the Company's directors, the management holding positions of SVP 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 and Internal Control Department two days in advance if necessary.

(5.4) The directors, the management holding positions of SVP and above, and VPs of FNA must disclose complete information in regard to the change of their securities holding to the Governance, Compliance and Internal Control Department, aside from reporting to the SEC, to report to the Board on a monthly basis for CG&BE compliance monitoring purposes. Shareholding by the directors and EVPs, VPs and above of FNA is also disclosed in the Company's annual report as required by the SEC.

9.1.2 Roles of Stakeholders

The Board has approved PTTEP's mission which puts an emphasis on the rights of and value creation for stakeholders. The Company's mission is to operate globally to provide a reliable energy supply and sustainable value to all stakeholders. On the other hand, the Company's stakeholders, whether they are internal or external parties, have always been taken into account when decisions are made. Major stakeholders of the Company are, including but not limited to, shareholders, customers, employees, governments, joint venture partners, communities, societies and environment, suppliers, creditors, competitors, customs and traditions groups, and human rights groups. The importance of the Company's stakeholders is clearly written in the CG&BE in which practical guidelines with respect to business ethics are established in an effort to maintain the balanced duties and responsibilities between the Company and our stakeholders. Details of the CG&BE, contact details, whistleblowing channels are disclosed in the Company's website.

9.1.2.1 Anti-Corruption Efforts

Importance

Valuing transparent and fair work performance under corporate governance, the PTTEP Board of Directors adopts zero tolerance on any form of corruption. Proper mechanisms are in place to steer each related sector under the Good Corporate Governance and Business Ethics of PTTEP Group or CG&BE, the PTTEP Group's regulations binding all across the organization, from the directors, the management, to all employees of PTTEP and subsidiaries, who are required to sign a commitment form agreeing to observe and conform 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 on a par with PTTEP's standards.

It is PTTEP's conviction that efficient anti-corruption measures require a sound governance structure together with a clear management system, adequate and proper risk management and internal controls, monitoring for strict and ongoing compliance, and independent audit. The explicit guidelines stated in the CG&BE requires all directors and the management to be CG leaders. The PTTEP Board of Directors assigned the Corporate Governance Committee to monitor compliance with 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, is centralized function to support and drive the compliance with the CG&BE and PTTEP Group's anti-corruption measures. At least every quarter, updates are to be provided to the Corporate Governance Committee and the Board of Directors. To this end, the CG&BE has been defined in writing under the internal control principles and published and distributed to all relevant stakeholders in Thai, English, and Burmese, as well as distribution on the Company's website for 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 sound 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 announced the policy to outsiders that PTTEP Group personnel will not accept gifts, entertainment, or any other benefit on any occasion. Integrity & Ethics has also been made a corporate value for cultivation across the organization.

Scope of PTTEP Group's Anti-Corruption Policy

PTTEP requires that the CG&BE should represent the PTTEP Group's anti-corruption policy. Its contents embrace the principles, guidelines, and clear examples on all matters related to anti-corruption measures. These include the definition of a governance structure stated under Corporate Governance; guidelines for conflicts of interest, procurement and contracts; 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, the management, and employees of PTTEP and 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 adopt suitable corporate governance and a suitable business ethics.

PTTEP defined corruption based on applicable rules and legislation, domestic and international. It focuses on intention as a prime consideration: a given action must be taken in the interests of the PTTEP Group and must not accompany an intention to use one's or others' authority for undue personal gain, which is unlawful or against the PTTEP Group's regulations. This 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 corrupt practices, these activities are mentioned so that practitioners may exercise extra precaution. PTTEP does not make donations to support political parties for election campaigns, both at the local and national levels.

Measures and Principles for Implementation

Implementation of anti-corruption measures involves the internal control system, risk management, compliance oversight, audit, and promotion of a corporate culture and ethics, each of which is under the responsibility of a functional unit. Therefore, PTTEP defined models of internal control and risk management by the “Three Lines of Defense”:

(1) The First Line of Defense is made up of various functional units charged with overseeing their respective work characterized by proper risk management and internal control together with compliance with all applicable laws and regulations. The people in this line of defense are trained 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 of Defense is 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 steering compliance with them. For instance, the units in charge of governance, risk management, internal control, and compliance (GRC) come under the Human Resources, Assurance, and Transformation Group. In place is 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. Such achievement is to be marked by proper risk management and under the scope of 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: leadership and commitment; policies, objectives, and plans; organization and resources; GRC assessment; controls and response; monitoring and assurance; audit; continual improvement; and communication and culture.

(3) The Third Line of Defense is made up of audit units and external auditors, responsible for independently auditing the overall performance of various management systems under the first and second lines.

The Internal Control Section regularly conducts internal control assessment on potential fraud risks, which include risks of asset misappropriation, corruption, and fraudulent financial reporting in order 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 function groups, assess our fraud risks on the basis of 3 considerations, namely, pressure, opportunity, and rationalization. The results of the assessment indicate that PTTEP has an adequate and appropriate level of internal control. The majority of the function groups have carefully assessed these 3 considerations and adjusted their measures so that they are timely and appropriate.

Continuous Communication and the Provision of Knowledge and Training

The Corporate Governance Committee has defined a clear plan for cultivating the CG&BE and business ethics 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 relevant actions included the following.

Measures for internal parties

(1) Organized Induction sessions for new directors, management, and employees to introduce an overview of governance, risk management, and compliance (GRC) for acknowledgment and compliance. A VDO on GRC Induction was prepared to educate employees operating at various sites to make it convenient for them and cover all bases to watch it.

(2) Organized quarterly GRC promotion for the Board before Board meetings to inform them of information and case studies helpful for the performance of directors and the management. The Chairman of the meeting stressed that the directors and management should also carry these out. The topics of 2019 were:

- 5 Trends that the Boardroom Should Know
- Cybersecurity and Data Privacy Laws
- Critical Success Factors in a GRC Implementation
- Environmental, Social, and Governance (ESG) Related Risks.

(3) Organized refresher GRC training courses (GRC 101) for those that had previously undergone inductions. Contents had to do with corporate governance and business ethics, risk management, internal control, and compliance, with an emphasis on anti-corruption and relevant matters so that employees may master these and duly implement them.

(4) Instituted CG&BE communication for the Malaysia Asset's executives and employees transferred from Murphy Oil, acquired by PTTEP, at its Kuala Lumpur office, including operation site supervisors at Bintulu and Labuan Island in Malaysia. The GRC program for Malaysia Asset has been developed and rolled out for their implementation.

(5) Developed a CG&BE E-Learning course for executives and employees in English with Thai and Burmese subtitles to expand the access to training, while a post-test immediately assessed employees' understanding.

(6) Jointly organized the PTT Group CG Day 2019, 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 2019: Digitization ... Challenge for the Governance", the activity was held on September 11, 2019, as an illustration of unity and commitment among the PTT Group in carrying out transparent businesses, ready to support the drive for all sectors (business, society, and the country as a whole) to adopt a work culture that is proper, transparent, fair, and corruption-free in a sustainable way.

(7) Established communication on conflicts of interest and the complaint handling together with the provision of protection so that management and employees may recognize their importance and confidently file complaints via the Company's defined channels with a good understanding of relevant procedures and protection. The number of complaints was disclosed as a summary along with each year's punished cases for all. (Details are shown under "Whistleblowing Reporting and Protection Procedures" part.) This is part of the campaign for all to nurture this corporate culture, marked by transparency and corruption-free practices.

(8) Instituted other ongoing communications to educate all across the organization and solicit employees' participation in activities on anti-corruption at the Headquarters and field sites e.g. the Anti-Corruption Day. Examples were PR signboards and a newsletter.

Measures for external parties

PTTEP has a clear intention to become a leading company in the realm of Corporate Governance (CG) internally and externally. This includes implementation of a policy which also covers external parties, for example, vendors, partners, and representatives of the PTTEP Group. The Company has continued to encourage these external parties to conduct businesses that are ethical and corruption-free through the following activities.

(1) Notifying all suppliers about the No-Gift Policy and request cooperation on stopping the giving of presents, tokens, or other benefit on any occasion to the directors, management, and employees of the PTTEP Group. Also, informing and inviting suppliers with the top 100 contract values to engage in online training (including test-taking) on anti-corrupt practices, with 70 percent in actual attendance and successful passing of the test.

(2) Announcing to external parties the No-Gift Policy explicitly on PTTEP's website and installing PR signboards on office premises, near spots where visitors can clearly see, in Thailand and other countries.

(3) Advocating to society a culture of good governance and anti-corruption. This year PTTEP took actions and participated in various key activities. (Details are shown under "Collective Efforts with the Public to Counter Corruption" section.)

(4) Establishing channels for external parties to inquire in case of questions or recommendations on corporate governance and business ethics by emailing corporatesecretary@pttep.com.

Whistleblowing Reporting and Protection Procedures

PTTEP's Board of Directors has established its 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 protection for whistleblowers and those cooperating with the Company in good faith. This mechanism allows 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, CG&BE, anti-corruption policies, and other related regulations, as committed by the Board, management, employees, or representatives of the PTTEP Group.

Investigation of complaints is conducted strictly and in an orderly way, in a proper manner, and within the timeframe and procedure prescribed in the regulation to ensure the transparency and fairness of the complaint-handling process. Examples are as follows:

- The Corporate Governance Section, Corporate Secretary Division, preliminary evaluates the information and adequacy of the evidence before forwarding the complaint to the Company's investigator within seven working days. If this period must be extended, the extension can only be made with the approval of the CEO. Each extension must not exceed seven working days.

- The investigators prescribed in the regulation must complete the investigation within 30 working days in every case. If the period is extended due to necessity, the extension can be made only with the approval of the authorized person (not more than seven working days at a time for non-complex cases and not more than 30 working days at a time for complex cases). The investigator cannot have vested interests in the complaint. Every complaint coming through the whistleblowing channels is summarized and reported to the Corporate Governance Committee and/or Audit Committee, depending on the case, and subsequently report to the Company's Board of Directors.

Whistleblowing channels of the PTTEP Group are as follows:

(1) Mail to PTTEP director, supervisor, or the Corporate Governance Section of the Corporate Secretary Division:

PTT Exploration and Production Plc.
555/1 Energy Complex Building A, 33rd Floor,
Vibhavadi Rangsit Road, Chatuchak, Bangkok 10900

(2) E-mail to the supervisor or the Corporate Governance Section of the Corporate Secretary Division (cghotline@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.

In 2019, PTTEP received a total of seven complaints through the whistleblowing channels. After reviewing the clarity and adequacy of these complaints, three cases were accepted for further investigation, and all investigations were completed. A summary of complaints is shown in the table below.

Topic	2017	2018	2019
Number of whistleblowing cases	8	10	7
Whistleblower			
- External reporter	4	2	2
- Internal reporter	2	7	2
- Anonymous reporter	2	1	3
Number of accepted cases after considering evidence and witnesses	7	6	3
Number of wrongdoing cases	3	4	1
Type of wrongdoing			
- Use and protection of information and assets	-	1	-
- Human resources (e.g. being late at work, inappropriate behaviour)	1	-	1
- Non-compliance with policy, regulation, and procedure	1	-	-
- Conflict of interest and corruption	1	3	-

After completing the investigation of these three accepted cases, there were no offenses regarding fraud or non-compliance with policies, procedures have been found for two reports. While, another report regarding inappropriate behavior of staff, i.e., drinking alcohol while performing duties, carrying a weapon into a working area, and displaying inappropriate behavior toward a subordinate has been considered serious disciplinary offense pursuant to the Human Resources Management Policy and Business Ethics on Human Resources. The offenders were subsequently terminated without severance pay. The Corporate Governance Section reported the results of the complaint investigation to related parties. The findings of the cases were used to carry out further improvements of the Company's internal control measures.

For more details of the Reporting and Whistleblowing Regulation and Whistleblowing System, please visit the PTTEP website at <https://www.pttep.com/th/Aboutpttep/Corporategovernance/ReportingAndwhistleblowingregulations.aspx>.

Monitoring the Implementation of Anti-Corruption Measures

The Board of Directors has assigned the Corporate Governance Committee to monitor actions concerning anti-corruption measures, which is part of the CG&BE. The Company Secretary, as this committee's secretary, gathers such outcomes to report 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 of Defense and Third Line of Defense), reports are made to the applicable Board sub-committees, including the Risk Management Committee and the Audit Committee. All actions are submitted to the Board of Directors and summarized for the shareholders in the annual report.

The Corporate Governance Committee monitors the outcomes of the annual CG&BE plan and assesses such outcomes against relevant KPIs to ensure goal achievement.

Audit

PTTEP designates the Internal Audit Division to perform auditing tasks, which include investigation of corruption, and undertaking further examination when complaints appear. Currently, the Internal Audit Division has a comprehensive set of practical guidelines on fraud investigation that covers risk assessment, prevention and detection of corruption, 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 issues that occur in PTTEP's work processes. The system has initially been conducted on the Procure to Pay process, and currently expanded to cover warehousing and inventory management, targeting the risk of non-compliance to regulations or work procedures that may possibly lead to fraud. When an issue has been detected, the system will send a notice directly to management, enabling them to promptly resolve the matter.

Collective Efforts with the Public to Counter Corruption

PTTEP acknowledges the significance of our role as a listed company by assuring our shareholders and stakeholders with the confidence that the Company's management is transparent, fair, and corruption-free. The Company, whose major shareholder is the government, has a responsibility to lead by example and to encourage society to adopt better anti-corruption standards. In 2019, the Company proactively took several measures and participated in several activities to counter corruption. These were, for instance, Thailand's National Anti-Corruption Day which was organized at BITEC Bangna by the Anti-Corruption Organization of Thailand (ACT) on September 6, 2019, where our management and employees

pledged to combat corruption; and International Anti-Corruption Day (Thailand) which was organized by the Thai government, Office of the National Anti-Corruption Commission (NACC), the Office of Public Sector Anti-Corruption Commission (PACC), the Anti-Corruption Organization of Thailand (ACT), and other anti-corruption networks at Impact Exhibition and Convention Center, Muang Thong Thani on December 9, 2019.

PTTEP was re-certified as a member of Thailand's Private Sector Collective Action Coalition Against Corruption (CAC) on May 17, 2018. This re-certification confirms our dedication and commitment to fight all forms of corruption, as well as affirming our effort to expand and encourage anti-corruption measures among subsidiaries, joint venture partners, vendors, and business partners.

9.1.2.2 Policy on Treatment to Stakeholders

(1) Shareholders

PTTEP respects the shareholders' rights and treats them with equality, while adhering to carrying out the Company's business with the CG&BE to achieve sustainability and create optimal value for shareholders. Details are disclosed in the "Shareholders' Rights and Equal Treatments" section.

(2) Employees

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

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

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

(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.

(2.2) 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.

(2.3) 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 in petroleum industry in each of the countries, types of work, required skills and expertise, difficulties of work, responsibility and accountability of each position, and the individual employees' performance results to attract and retain competent and capable employees.

(2.4) 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, housing interest subsidy program, and healthcare benefits for employees and their families which are comparable to those provided by other petroleum companies in each of the countries. 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 family, private life, and work concerns. The services are provided by psychologists and professionals from one of our consulting companies.

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. Receiving this fund is subject to the Company’s regulations.

In addition, the Company also establishes the Long Service Awards Program to celebrate and commemorate the long-term commitment and loyalty of our employees who have achieved significant milestone years of service, namely, 5, 10, 15, 20, and 25 years of employment with the Company. The award recipients are honored at the special event held at our headquarters in June of every year. 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 long-standing careers within the Company.

(2.5) 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 to all employees, so they can work with the same standard of expected behaviors to attain the Company’s vision and mission. In 2019, our employees attended training and development programs such as ISO 14001 Environment Awareness Course at an average of 43 hours per person per year. Details are disclosed in the “Management Structure” section under “Human Resources Development Policy” part.

(2.6) PTTEP realizes the value and importance of a 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, as well as to maintain a good working relationship between them. Shall any conflicts arise between the employees and their supervisors, the employees may file a complaint through channels provided. The employees, including relevant witnesses, who comply with the provided measure and procedure and act in good faith shall be protected, without facing a penalty, termination, or any other negative consequences. The CG Hotline channels are also established for the employees to raise the issues relating to fraud. The reports received through these channels will be investigated confidentially and made known only to relevant persons to protect the whistleblowers.

(2.7) PTTEP conducted the Employee Engagement Survey with an objective to understand the factors relating to our employees' engagement with the Company to improve the policies and practices. The past results confirmed that staff engagement is continuously improving. The Company also conducted focus group interview sessions to gather information to establish the improvement plan at both the organization and the function group levels. The Company continued to regularly monitor the progress of such plan and will continue to conduct the Employee Engagement Survey again in 2020.

(3) Clients

PTTEP is committed to our mission to be a leading producer and supplier of crude oil, natural gas, condensate and LPG at fair and competitive prices. The Company sells the products under short-term to long-term contracts as well as in spot markets. The Company assesses clients' suitability against the four following criteria, namely, economic returns of product prices, financial stability, safety standards, and compliance with local laws and regulations of each client. The Company treats all buyers equally for the optimal long-term 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 is dedicated 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 Society

PTTEP Corporate Social Responsibility Policy emphasizes 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 by all PTTEP operations.

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

(7) Environment

With PTTEP's Vision for being the "Energy Partner of Choice" through competitive performance and innovation for long-term value creation, creating shared values and benefits for all stakeholders, the Company engages stakeholders for shared values and mutual benefit. The Company continually strives to achieve excellence and become a leadership in Safety, Security, Health and Environment (SSHE). The Company's SSHE Policy, SSHE Management System, standards, procedures, guidelines and tools as well as KPIs are developed and implemented throughout the operations in order to achieve our vision and commitment to SSHE. The Company continues to publicly disclose the SSHE performances indices, such as the lost-time injury frequency rate, total recordable injury rate, and hydrocarbon and chemical spill rates on the website. The information is routinely communicated with the Company's external and internal stakeholders, including staff and the Department of Mineral Fuels, through the annual Sustainability Report.

PTTEP implements an environmental management system according to the ISO 14001 standard to improve the efficiency of the environmental management system. Currently, the Company receives the ISO 14001:2015 Certification, issued by AJA Registrars (currently, called SOCOTEC Certification (Thailand) Co., Ltd.) under the United Kingdom Accreditation Services (UKAS). The certified sites include the Arthit Project, Greater Bongkot North and South fields of Bongkot Project, S1 Project, PTTEP 1 Project, L53/43 & L54/43 Project, Sinphuhorm Project, Petroleum Core Research Center, and PTTEP Petroleum Development Support Base (Songkhla and Ranong Province), and in Block M9, Zawtika Operation Center and Office of the Zawtika Project in the Republic of the Union of Myanmar.

PTTEP continues implementing the Green Practice Roadmap, which is aimed to mitigate environmental impacts from the operations. The roadmap also aims to increase efficiency and create value-adding processes to the Company's business by reducing greenhouse gas emission, studying energy efficiency, increasing the biodiversity of our operating sites, CO₂ sequestration by reforestation, reducing operating costs through improving resource efficiency, and reducing waste. The Company also continues to follow the 5S program throughout our offices similarly to those implemented within the PTT Group as well as to continue with the Group's green supply chain practices, which involve green procurement, green logistics, green offices and carbon-neutral events to use green and environmentally friendly products in the operations. In addition, the Company encourages all employees, both operational and management levels, to understand our environmentally friendly business practices by regularly organizing fundamental and intensive environmental awareness training courses for them in compliance with the laws.

(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 takes into account Safety, Security, Health, and Environment (SSHE). 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 new vision, PTTEP leverages "Energy Partner of Choice" through competitive performance and innovation for long-term value creation.

PTTEP Vendor Guide

PTTEP developed a Vendor Guide to provide our vendors with the necessary information for contacting and conducting business with PTTEP. The information contained includes the 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 three 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 for a preliminary review of their qualifications.

New Vendor Pre-qualification

PTTEP pre-qualifies suppliers by screening and evaluating them according to their product and service categories. The evaluation process is performed by a special procurement committee, which comprises three functional areas:

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

Independently, with equality and transparency, each function of the committee has the authority to consider and evaluate vendors to ensure that they possess the qualifications to deliver the products or provide the services needed. In addition, we also carry out background checks concerning any wrongdoings related to bribery and corruption. 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 document was issued to ensure better understanding as well as to encourage appropriate operational planning. The SSHE Contractor Forum with the vendors is organized annually to promote better understanding about our policies, standards, manuals, operational procedures, and work safety plans on petroleum exploration and production operations in all of the locations in which we operate.

Government Procurement and Supplies Management Act B.E. 2560

As a state enterprise, PTTEP must comply with the Government Procurement and Supplies Management 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 requirements of 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.

Procurement Sourcing Strategy

PTTEP prepares an analysis to review overall procurement performance by using historical procurement data. This data is used to analyze operational and market risks, classify products and services into categories (Category Management), and analyze spending by region in order to identify critical product categories based on their values and risks.

Upon identifying the critical product categories based on their values and risks, we use the information to prepare a procurement strategy, a contract of each product and service category, market analysis in support of future procurement planning, and a supplier relationship management plan. The procurement strategy and contract, including a list of bidders, will then be submitted to the Procurement Committee (PC) and joint-venture partners (if any) for approval prior to proceeding with the bidding. (For transparency, the procurement strategy, contract, and list of bidders must be internally approved by the three functions, namely operations, assets, and procurement prior to being submitted to the PC and joint-venture partners, in order to ensure checks and balances as well as verifiability.)

In addition, under the Production Sharing Contract (PSC), PTTEP is required to submit an Annual Master Procurement Plan (AMPP) in order to obtain endorsement from the Department of Mineral Fuels (DMF) for procurement valued over THB 10 million prior to sourcing process. For any procurement transactions which have a Procurement Strategy, DMF's endorsement is required 30 days in advance of the 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 and the other 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 results to DMF, and in the event that an awarded contract value is 10 percent higher or lower than the 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 those which offer the lowest price or are in the best interests of the PTTEP Group. Additionally, PTTEP has adopted a weighted technical and price scoring method in the vendor selection process with a view to engaging qualified vendors offering competitive prices through a process that is transparent and verifiable.

Contract Management and Assessment

Contract management and Supplier Relationship Management (SRM) is an important component of 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 plans, contract objectives, SSHE standards, and risk mitigation plans, as well as key performance indicators (KPIs). The contract holder also needs to assess and follow 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 must also complete the Contract Closed-out Report to identify areas of improvement regarding the operations and long-term sustainable relationship with the vendor.

Vendor Collaboration Initiatives

In 2019, PTTEP continued to develop an effective supply chain management and support vendor collaboration initiatives to maintain a good relationship with vendors. Contractor meetings were held with vendors under critical work categories, e.g. Offshore Drilling Rig, in order to communicate Company policy and direction as well as receiving feedback from vendors. The objectives of the meeting were to enhance and improve work efficiency and foster collaboration between PTTEP and vendors. Additionally, PTTEP organized Management Visits to potential vendors' operational premises in order to seek cooperation from new potential vendors in the future.

In addition, PTTEP organized the "2019 SSHE Contractor Forum" with the key objective of demonstrating PTTEP's strong commitment to continuously improving Safety, Security, Health, and Environment in our operations. Practical guidelines for reducing supply chain risk in social, environmental, and governance (ESG) were also communicated to our key vendors at workshops to nurture understanding and encourage them to adopt the same approach.

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, it also reduces the outflow of capital to other countries. As a result of our commitment to fostering a long-term relationship with the communities where we operate, we have been entrusted by the respective communities with licenses to operate. Meanwhile, we also encourage our vendors to operate with care and responsibility wherever they work, 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 concretely achieve these goals, we give priority to the supply chain management and the monitoring of our vendors.

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

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

For more effective supply chain management in vendor management, in 2019 PTTEP and PTT Group conducted a Supplier On-site Audit by External Party for four of our key suppliers in Drilling-Related and Well Services categories. All four suppliers passed the ESG assessment. Consistent with our policy and that of PTT Group, a workshop held by an external party was organized to promote better understanding among our vendors about 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 their reporting in good faith of suspicious misconduct or wrongdoing by directors, the management, employees, or persons acting on behalf of the Company which might be in violation of the law, CG&BE, or other regulations of PTTEP Group, the Company established the CG Hotline to handle the matters. Vendors can email cghotline@pttep.com or report through "PTTEP Whistleblowing System" at www.pttep.com.

Digital Transformation in Vendor Management

PTTEP leverages digital technology in managing our vendors in order to enhance efficiency and comprehensively 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.

In 2019, PTTEP focuses on system and process integration throughout supply chain management by integrating supply chain and supplier data analysis with external sources of data into the Company's system. Additionally, we have integrated the annual procurement planning process, sourcing, logistics and payment process in order to make the entire process agile and support the 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, 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 external 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 debenture holders and other creditors, PTTEP's debenture 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 losses which may arise as a result of PTTEP's non-compliance with the requirements for debenture issuers' rights and duties as well as borrowing terms.

(10) Competitors

PTTEP treats our competitors with professionalism, equality, fairness and transparency. The Company, in our best effort, does not slander competitors. The Company 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 of all the areas and locations in which we operate. Orientations and trainings are provided by knowledgeable and experienced instructors as well as representatives from the Ministry of Foreign Affairs or the local embassies who are capable to provide suggestions and information in regard to customs, traditions, sensitive issues, and local practices to the employees who will be transferred there to understand and behave appropriately.

(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 fifth consecutive year. Additionally, PTTEP received the winning award for the state enterprise sector as the 2019 Role Model Organization on Human Rights from the Department of Rights and Liberties Protection, the Ministry of Justice.

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.

(13) Laws

PTTEP respects laws everywhere we operate. The Board sets forth the matters relating to the compliance with applicable laws and regulations in the Business Ethics of the PTTEP Group. The directors, management, and employees are required to understand as well as strictly abide by the laws relating to the Company's operations in all areas to enable the PTTEP Group to operate with accuracy and efficiency.

The Governance, Compliance, and Internal Control Department is the center of compliance performance and supervision of the PTTEP Group. The Department has a direct reporting line to the Senior Vice President of Corporate Secretary Division, the Executive Vice President of the Human Resources, Assurance, and Transformation Group, and the President and 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 the roles of all managers and employees in promoting compliance. The Compliance Program, on the other hand, has continuously been developed to enhance awareness of compliance-related matters among the employees. In 2019, the Company developed a Compliance Manual as a guidebook for ensuring a consistent and effective approach to operating/working, with compiled applicable laws, Company's regulations, as well as contractual obligations to enhance employees' awareness on internal and external compliance.

9.1.3 Information Disclosure and Transparency

9.1.3.1 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. At the very least, 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 general public are the Investor Relations Section (IR) and the Communications Department.

Our information disclosure consists of financial information and non-financial information. In 2019, 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 unreviewed quarterly and 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 review and 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 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 in the Company's website which also features other up-to-date information considered to be of interest to the aforementioned parties. Key information available in 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. The Company also makes available on the website videos and infographics presenting the financial information and operating results for those interested.

The Company also publishes a quarterly investor newsletter, the Explorer's Journal, which includes information which 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 available in both hardcopy and electronic formats. The latter can also be downloaded from the Company's website and subscribed to receive our e-newsletter. Besides, The Company also launched PTTEP Investor Relations Mobile Application and Chatbot, effectively serving as additional communication channel between the Company and shareholders for news and updates.

In 2019, PTTEP disclosed a total of 43 articles through the SET portal and organized the following activities for the shareholders and analysts.

Activities	Amount (Times)
Domestic and overseas roadshows/conferences	19
Analyst meetings	4
Opportunity day (by SET)	4
Analyst, Shareholders' and investors' site visits	8
Knowledge sharing events for investor	7
Company visits and conference calls	40

Apart from the activities above, the Company also participated in a number of events organized by the SET for retail investors, such as "SET in the City", and interacted with the investors through daily telephone correspondence. 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 understands 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 our best in this area.

9.1.3.2 Investor Relations

The Investor Relations Section (IR) is responsible for communication of relevant information and news which reflect PTTEP's fair value to analysts, the Company's 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, while also relied upon to coordinate and to advise over IR related issues to the Company's executives.

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

- (1) By phone: +66-2537-4868, +66-2537-5983, +66-2537-5843, +66-2537-5522
and +66-2537-4891
- (2) By e-mail: ir@pttep.com
- (3) By fax: +66-2537-4444

9.1.4 Board's Responsibilities

The followings are major responsibilities of the Board. Details are disclosed in the "Management Structure" section, "Duties and Responsibilities of the Board" part.

(1) Policy-Making and Operational Direction

The Board is responsible for making decisions in regard to 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 advices 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 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 justification and ethics 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 Section 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 Section 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 which is a standing sub-committee to monitor and ensure an 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 importance of full legal compliance in all of the areas in which the PTTEP Group operates. The Board also provides the Group with the supports 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.

9.2 Sub-Committees

The PTTEP Board is responsible for the appointment of the directors who have expertise and knowledge in certain areas as 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 Committee, Remuneration Committee and the Corporate Governance 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, with only the exception of the Risk Management Committee, must be an independent director. Applying to every meeting, the sub-committees are required to report the results to the Board for acknowledgement as well as to disclose them in the 56-1 Form and PTTEP Annual Report as the duties to be completed over the year.

Currently, the Company has five sub-committees, namely, (1) the Corporate Governance Committee, (2) the Audit Committee, (3) the Remuneration Committee, (4) the Nominating Committee, and (5) 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 in the "Reports of the Sub-Committees" section.

9.3 Nomination of Directors, the President and Chief Executive Officer, and Management

9.3.1 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 Committee to select the candidates who fit with the required skill, 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, independency and conflicts of interest. In 2019, PTTEP Board comprises of 8 independent directors and 2 female directors from 15 directors.

Moreover, the Nominating Committee conducts Gap Analysis of the Board's current Skill Mix and Target Skill Mix are taken into account, where Target Skill Mix of the Board during 2019 – 2020 consisted of the 3 following priorities;

(1) Organization Change and Development: To push PTTEP's operations to align with "Execute" Strategy specially to set up internal control and compliance systems for newly acquired projects internationally according to the post-merger integration, the experienced director nominee who keen on business integration in multinational organizations is necessary for PTTEP.

(2) Technology: In the rapid changes of technology, PTTEP has to adapt and be ready to cope with Disruptive Technology by developing its own enterprise technology capability to support the operations not only in E&P core business but also the investment opportunity in new businesses that may arise with the aim to become Digital Transformation excellence organization. The director nominee who has skill on wide spectrum of technology to be used to transform the organization is desirable.

(3) Legal: To support legal risk management and compliance which are corporate-level risks with direct impact to 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.

The process begins with the Committee considering the alignment between the aforementioned Target Skill Mix and the candidates', where the Board has been able to fulfill the Target Skill Mix in Organization Change & Development and Technology in 2019 while still placing importance in future candidate nomination with the skill mix in Legal. In addition, the Nominating Committee also hold the process of searching through PTTEP's pool as well as the State Enterprise Policy Office (SEPO)'s directors' pool which comprises a list of directors from state-owned enterprises who are regarded as highly-qualified in state-enterprising. The Company also seeks advices from our major shareholder, PTT, as well as from the Company's minor shareholders (if any) according to the rules in regard to nomination of a person to fill in the positions which are due to retire 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 retire by rotation must obtain an approval from the AGM by the majority vote which is 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 exceeds 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 the 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-fourths 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.

9.3.2 Nomination and Succession Plan of the President and Chief Executive Officer

The Nominating Committee has included in its Charter the role to consider the President and Chief Executive Officer's 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 Committee is responsible for considering the candidates' skills, experience, and various other specific qualifications to bring about the best of interests to the Company, looking into their probable conflicts of interest.

The Company formulates a succession plan for the President and Chief Executive Officer to prepare the Company for the time when the President and 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, on 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, 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 President and Chief Executive Officer in one of PTT Group of companies.

(2) PTTGMC, with PTT being 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 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 Committee proposes the name of the final candidate, together with the opinions and a fair and reasonable package proposed by the Remuneration Committee, to the Board for approval and appointment of the Company's new President and Chief Executive Officer.

9.3.3 Nomination of Management and Succession Plan

The Board grants the President and 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 Committee (CRB) and the presence of PTTEP Rules and Regulations for Human Resources Management. The nomination must then be acknowledged by the Board. Exceptions are made to 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 nomination of the Head of Audit Function requires an approval from the Audit Committee.

PTTEP has a systematic 5-year succession plan for the vacant management positions which are resulted from 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 of each business area (Asset Management, Business Development, Technical Support, and Business Support) as screening criteria. These profiles comprise competency, personal attribute, organization

knowledge, as well as experience required for the target positions, while Currently Estimated Potential (CEP) 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 according to the corporate values and organizational culture to ensure that the successors are readily qualified for the target positions by the time of the requirement.

9.4 Development of Directors

Orientation of New Directors

The orientation which is provided to the Company's new directors consists of the followings.

(1) Presentation by the President and 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 of the PTTEP Group, relevant rules and regulations, the 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 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, yet they are ambitious to learn and understand more about the business and their duties as a director. 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 roles. To continuously provide knowledge and share opinions with the directors, the Company's management delivered lectures and exchange opinions with the Board. In 2019, five sessions were arranged by the Company's management which were "Strategy Review" and the other four 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 followings are details of the trainings, seminars and lectures attended by the Company's directors during 2019.

Directors	Courses
(1) Mr. Prajya Phinyawat	<ul style="list-style-type: none"> - Annual international energy conference “CERAWEEK 2019”, Texas, U.S.A. - Internal Lecture and Discussion Session on 2020 Strategy Review - Internal Lecture about GRC on the following topics: <ul style="list-style-type: none"> (1) 5 Trends that Boardroom Should Know; Disruption, Cyber Security, Consumer Engagement, Environment, Social and Governance (ESG) and Crisis Management (2) Cybersecurity and Data Privacy Laws (3) Critical Success Factors in a GRC Implementation (4) Environmental, Social and Governance (ESG) Related Risks
(2) Mr. Achporn Charuchinda	<ul style="list-style-type: none"> - Internal Lecture and Discussion Session on 2020 Strategy Review - Internal Lecture about GRC on the following topics: <ul style="list-style-type: none"> (1) 5 Trends that Boardroom Should Know; Disruption, Cyber Security, Consumer Engagement, Environment, Social and Governance (ESG) and Crisis Management (2) Cybersecurity and Data Privacy Laws (3) Critical Success Factors in a GRC Implementation (4) Environmental, Social and Governance (ESG) Related Risks
(3) Admiral Tanarat Ubol	<ul style="list-style-type: none"> - 2019 The Annual Petroleum Outlook Forum : “Sustainable Energy...Shaping a Better Future” arranged by PTT - Internal Lecture and Discussion Session on 2020 Strategy Review - Internal Lecture about GRC on the following topics: <ul style="list-style-type: none"> (1) 5 Trends that Boardroom Should Know; Disruption, Cyber Security, Consumer Engagement, Environment, Social and Governance (ESG) and Crisis Management (2) Cybersecurity and Data Privacy Laws (3) Critical Success Factors in a GRC Implementation (4) Environmental, Social and Governance (ESG) Related Risks
(4) Mr. Sethaput Suthiwart-Narueput	<ul style="list-style-type: none"> - Annual international energy conference “CERAWEEK 2019”, Texas, U.S.A. - Internal Lecture and Discussion Session on 2020 Strategy Review - Internal Lecture about GRC on the following topics: <ul style="list-style-type: none"> (1) 5 Trends that Boardroom Should Know; Disruption, Cyber Security, Consumer Engagement, Environment, Social and Governance (ESG) and Crisis Management (2) Cybersecurity and Data Privacy Laws (3) Critical Success Factors in a GRC Implementation
(5) Major General Nimit Suwannarat	<ul style="list-style-type: none"> - Internal Lecture about GRC on the following topics: <ul style="list-style-type: none"> (1) 5 Trends that Boardroom Should Know; Disruption, Cyber Security, Consumer Engagement, Environment, Social and Governance (ESG) and Crisis Management

Directors	Courses
	<ul style="list-style-type: none"> (2) Cybersecurity and Data Privacy Laws (3) Environmental, Social and Governance (ESG) Related Risks
(6) Mr. Twarath Sutabutr	<ul style="list-style-type: none"> - Annual international energy conference “CERAWeek 2019”, Texas, U.S.A. - Executive Program in International Management by Stanford – National University of Singapore (NUS) - Internal Lecture and Discussion Session on 2020 Strategy Review - Internal Lecture about GRC on the following topics: <ul style="list-style-type: none"> (1) 5 Trends that Boardroom Should Know; Disruption, Cyber Security, Consumer Engagement, Environment, Social and Governance (ESG) and Crisis Management (2) Cybersecurity and Data Privacy Laws (3) Critical Success Factors in a GRC Implementation (4) Environmental, Social and Governance (ESG) Related Risks
(7) Mr. Pitipan Teparimargorn	<ul style="list-style-type: none"> - Internal Lecture and Discussion Session on 2020 Strategy Review - Internal Lecture about GRC on the following topics: <ul style="list-style-type: none"> (1) 5 Trends that Boardroom Should Know; Disruption, Cyber Security, Consumer Engagement, Environment, Social and Governance (ESG) and Crisis Management (2) Cybersecurity and Data Privacy Laws (3) Critical Success Factors in a GRC Implementation (4) Environmental, Social and Governance (ESG) Related Risks
(8) Mr. Bundhit Eua-arporn	<ul style="list-style-type: none"> - Internal Lecture and Discussion Session on 2020 Strategy Review - Internal Lecture about GRC on the following topics: <ul style="list-style-type: none"> (1) 5 Trends that Boardroom Should Know; Disruption, Cyber Security, Consumer Engagement, Environment, Social and Governance (ESG) and Crisis Management (2) Cybersecurity and Data Privacy Laws (3) Critical Success Factors in a GRC Implementation (4) Environmental, Social and Governance (ESG) Related Risks
(9) Ms. Penchun Jarikasem	<ul style="list-style-type: none"> - Internal Lecture and Discussion Session on 2020 Strategy Review - Internal Lecture about GRC on the following topics: <ul style="list-style-type: none"> (1) 5 Trends that Boardroom Should Know; Disruption, Cyber Security, Consumer Engagement, Environment, Social and Governance (ESG) and Crisis Management (2) Cybersecurity and Data Privacy Laws (3) Critical Success Factors in a GRC Implementation (4) Environmental, Social and Governance (ESG) Related Risks
(10) Mr. Chansin Treenuchagron	<ul style="list-style-type: none"> - Internal Lecture and Discussion Session on 2020 Strategy Review - Internal Lecture about GRC on the following topics: <ul style="list-style-type: none"> (1) 5 Trends that Boardroom Should Know; Disruption, Cyber Security, Consumer Engagement, Environment, Social and Governance (ESG) and Crisis Management

Directors	Courses
	<ul style="list-style-type: none"> (2) Critical Success Factors in a GRC Implementation (3) Environmental, Social and Governance (ESG) Related Risks
(11) Mr. Patchara Anuntasilpa	<ul style="list-style-type: none"> - Senior Executive Program on Justice Administration (Class 23) by Judicial Training Institute - Internal Lecture and Discussion Session on 2020 Strategy Review - Internal Lecture about GRC on the following topics: <ul style="list-style-type: none"> (1) 5 Trends that Boardroom Should Know; Disruption, Cyber Security, Consumer Engagement, Environment, Social and Governance (ESG) and Crisis Management (2) Cybersecurity and Data Privacy Laws (3) Critical Success Factors in a GRC Implementation (4) Environmental, Social and Governance (ESG) Related Risks
(12) Mr. Dechapiwat Na Songkhla	<ul style="list-style-type: none"> - Internal Lecture about GRC on the following topics: <ul style="list-style-type: none"> (1) 5 Trends that Boardroom Should Know; Disruption, Cyber Security, Consumer Engagement, Environment, Social and Governance (ESG) and Crisis Management (2) Cybersecurity and Data Privacy Laws (3) Critical Success Factors in a GRC Implementation (4) Environmental, Social and Governance (ESG) Related Risks
(13) Mr. Atikom Terbsiri	<ul style="list-style-type: none"> - Public Lecture on “Global Oil & Gas Markets in Turmoil - Implications for Thailand” by The Petroleum Institute of Thailand (PTIT) - Internal Lecture about GRC on the following topics: <ul style="list-style-type: none"> (1) Environmental, Social and Governance (ESG) Related Risks
(14) Mrs. Angkarat Priebjriwat	<ul style="list-style-type: none"> - DCP Series 4/2019 : How to Develop a Winning Digital Strategy by Thai Institute of Directors (IOD) - Understanding Thailand Data Protection Law and Its Unintended Consequence by Acis Professional Center Co., Ltd. - Internal Lecture and Discussion Session on 2020 Strategy Review - Internal Lecture about GRC on the following topics: <ul style="list-style-type: none"> (1) Environmental, Social and Governance (ESG) Related Risks
(15) Mr. Phongsthorn Thavisin	<ul style="list-style-type: none"> - Annual international energy conference “CERAWEEK 2019”, Texas, U.S.A. - Internal Lecture and Discussion Session on 2020 Strategy Review - Internal Lecture about GRC on the following topics: <ul style="list-style-type: none"> (1) 5 Trends that Boardroom Should Know; Disruption, Cyber Security, Consumer Engagement, Environment, Social and Governance (ESG) and Crisis Management (2) Cybersecurity and Data Privacy Laws (3) Critical Success Factors in a GRC Implementation

Directors	Courses
	(4) Environmental, Social and Governance (ESG) Related Risks

Currently, 12 of 14 of the Company’s directors have participated in IOD’s Director Certification Program (DCP), while 4 has attended the IOD’s Director Accreditation Program (DAP). As a result, there are 13 out of 15 directors (86.67%) who have attended the two mentioned courses. In addition, the Company provided them with the information in regard to new and updated seminars or trainings to keep the directors consistently informed. Details of the training courses attended by the directors are disclosed in the “Information of the Board of Directors, Management, Controlling Persons, and Company Secretary” section.

9.5 Authority of the President and Chief Executive Officer

9.5.1 Authority under Resolutions from the Shareholder Meetings

The President and Chief Executive Officer is the authorized signatory who may sign to bind PTTEP with external parties under clause 9, paragraph 6, of the Company’s Articles of Association registered with the Ministry of Commerce.

9.5.2 Authority under Resolutions from the Board’s Meetings of PTTEP

The Board authorizes the President and 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 President and Chief Executive Officer is also authorized to be the acting body, conducting the business under PTTEP regulations, namely, the Budgetary, Finance and Accounting Charter B.E. 2555, Regulation on Human Resources Management B.E. 2548, Regulation on Procurement for PTT Exploration and Production Public Company Limited and Affiliate B.E. 2561, and Regulation on Investment Project Management B.E. 2557, by applying of the practices comparable to those of other private companies in the E&P business as well as in best interests of the Company. The President and 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 of the authority.

9.6 Corporate Governance Concerning Subsidiaries and Associated Companies

Details are disclosed in the “Policy and Business Operations Overview” section, “Structuring Policy of the PTTEP Group” part.

9.7 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 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 (a two-term or six-year term, in example). This is so that the Nominating 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 in the "Information of the Board of Directors, Management, Controlling Persons, and Company Secretary" part. As of December 31, 2019, none of the directors held a directorship in more than three listed companies. Meanwhile, serving term of the members of the sub-committees is equal to that of the Board members.

9.8 Roles of the Chairman and the President 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 the President and Chief Executive Officer where the Chairman and the President 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 shareholder's expectations, with independency from the management
- (2) Determine agendas for the Board's meetings
- (3) Be the 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 President and Chief Executive Officer meanwhile is responsible for the Company's daily management with the authority as empowered and granted by the Board.

9.9 Independence of the Chairman

PTTEP considers independency as the first priority in election of the Company's Chairman of the Board. Shall there be none who is suitable for the position, the Company's directors will be considered. The current Chairman, Mr. Prajya Phinyawat, is an independent director and has performed his duties with autonomy and discretion. The appraisal score of the Chairman in 2019 was 2.98 out of 3. The Chairman and his performance were appraised and examined for future improvements by the Board. Details of the appraisal results are disclosed in the "Performance Appraisal of the Board" part. 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 in 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.

9.10 Policy and Practices for the President and Chief Executive Officer, and Executives with Directorships in Other Companies

PTTEP clearly states 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 President and Chief Executive Officer and executives. The

individuals must be given an approval from the Company's authorized personnel, on 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 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 in the "Information of the Board of Directors, Management, Controlling Persons, and Company Secretary" section.

9.11 Conflict of Interest Policy

PTTEP, under the following principles, is committed to preventing all potential conflicts of interest to ensure the Company's stakeholders' confidence that our business management is efficient, transparent, and in compliance with the CG&BE.

- (1) Directors, the management, and employees shall treat the interests of the PTTEP Group with priority and shall not participate or be involved in all activities which may lead to any conflicts of interest.
- (2) Directors, the management, and employees shall review and disclose, at least on an annual basis, their transactions that have led to a conflict of interest with the Company.
- (3) Directors, the management, and employees shall not participate in considering or voting on any matters in which they have a stake or stakes, and, if such matters exist, all relevant information shall be completely disclosed.
- (4) Directors, the management, and employees shall strictly adhere to the laws and regulations as required by the SET, particularly in relation to connected transactions.

The Company has established preventive measures for conflicts of interest as follows:

- (1) Directors, the 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, the management, and employees who may have a potential conflict of interest in regard to procedures relating to a bidding process, and selection and awarding of the transaction, must report to their supervisors or those participating in the given process through the Company's "Conflict of Interest Declaration Form". They must also withdraw themselves from participating in such process.
- (3) Directors, the management, and employees must notify the Company immediately should there be any suspicion or uncertainty that 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 review their possible involvement in 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 disclose their transactions which may lead to a conflict of interest at least every six months. This is in order for the supervisors to consider a re-assignment of duty to prevent such conflicts of interest from occurring.

9.12 Business Ethics

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

Business Ethics of the PTTEP Group is part of the CG&BE. The Board first established its Business Ethics in 1989, and it has been revised every year. The current version of the CG&BE was approved by the Board on January 30, 2019, and it is regarded as the highest regulation for business operations within the PTTEP Group. The CG&BE is available for downloading from the Company's website.

PTTEP's Business Ethics as a whole 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 and to which the Company's directors, the management, and employees must adhere.

- (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 CG&BE booklets to all the directors, management, and employees for their reference and adherence. Everyone is also required to sign their names, thus committing themselves to apply the CG&BE to the highest working standards. In addition, the booklets are sent to the Company's business partners, regulatory organizations, 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 CG&BE booklets can also be found at the Company's website under the Corporate Governance section.

PTTEP continuously enhances and promotes the knowledge and understanding of the Company'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 the policy accordingly. Communications also extend to external parties, for example, vendors, joint-venture companies, and agents of the PTTEP Group in order to encourage ethical cultures among their groups and society in general. Details are explained in the "Continuing to Provide Communication, Knowledge and Training" subsection under the "Anti-Corruption" section.

The Board's role involves monitoring and evaluation of CG&BE activities. The Corporate Secretary Division is in charge of reporting them to the Corporate Governance Committee and the Board on a quarterly basis to ensure that CG&BE activities achieve the targeted performance. The Corporate Governance Committee has already reviewed the 2020 plan by taking into account the 2019 evaluation results related to CG&BE and anti-corruption measures to ensure continuity and efficiency for the development of the following annual plan for this year's operations.

9.13 Internal Controls

PTTEP values continual improvement of the internal control system based on the international standard under COSO 2013 Internal Control – Integrated Framework, issued by The Committee of Sponsoring Organizations of the Treadway Commission, to reasonably assure that three business objectives can be accomplished. These objectives are (1) *operations* with efficient, effective, and prudent use of resources and safeguarding of assets, (2) *reporting* with accurate, reliable, and timely disclosure of financial and non-financial information for internal and external uses, and (3) *compliance* with laws, rules, and regulations as well as the Company's policies and procedures.

PTTEP's internal control system comprises five key components as follows:

(1) Control Environment

PTTEP has a control environment which promotes ethical work attitudes and the work atmosphere where the Company's internal control system is conducted according to PTTEP principles of Good Corporate Governance and Business Ethics (CG&BE) as well as our main corporate objectives: Growth, Prosperity, Stability, Sustainability, and Dignity. The Board is responsible for governing and enhancing this internal control system, and the Company has correspondingly designed an appropriate organizational structure, reporting lines, and delegation of work authority.

In addition, PTTEP also focuses on human resource management by establishing an extensive set of human resource management regulations and policies which attract, develop, and retain competent individuals who are deemed in line with the corporate objectives. The management and employees are also held accountable for their internal control responsibilities to ensure achievement of the corporate objectives.

(2) Risk Assessment

PTTEP values risk management by appointing the Risk Management Committee, which is responsible for setting a policy, risk appetite and risk metrics & limits, as well as overseeing the effectiveness of company-wide risk management. The Company has also applied the ISO 31000 Risk Management concept company-wide and 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.

(3) Control Activities

PTTEP has adequate control activities which are able to mitigate risks to acceptable levels for their respective business environments or business units. Control activities have been established to mitigate risks and also periodically reviewed and improved. For instance, deployment of control is done through policies and work procedures, or usage of technology. The Company also encourages employees to be 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.

(4) Information and Communication

PTTEP realizes the significance of information and communication to support business operations and make effective decisions, particularly information processing systems that are accurate, complete, up-to-date, accessible, protected, verifiable, and stable, and permits only authorized persons to access confidential information. Additionally, The Company also implemented Data Classification policy to ensure that sensitive information is properly protected.

PTTEP 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. Moreover, the Reporting and Whistleblowing Regulation 2013 offers protection to those who report actual or suspected misconduct and collaborate with the PTTEP Group in good faith from any form of retaliation.

(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 operational activities along with separate evaluations to ensure that the system is adequate and appropriate 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 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 responsibilities to perform independent audits correspondingly.

Details of the 2019 internal control adequacy evaluation results are disclosed in the "Internal Controls and Risk Management" section.

9.14 Risk Management

PTTEP Board and the management recognize the importance of strong and effective risk management as changes in the business environment are uncontrollable and may impact the businesses. The Company therefore established the Risk Governance Framework, Risk Appetite Statement as well as Risk Metrics and Risk Limit as the guidelines. Enterprise Risk Management Policy requires the directors, the management, employees, suppliers and contractors to manage risks thoroughly and systematically to ensure our target achievement.

The Company applies risk management guidelines in accordance with the ISO 31000, an international standard for risk management, throughout the Company. Risk management practices are applied throughout the organization, including strategic planning and management, investment and divestment decision-making, capital project management, and operations and business processes. The company also manages risks at all levels, including the corporate, asset/project, and working units. PTTEP's Board of Directors appointed the Risk Management Committee to play a vital role into overseeing that

PTTEP's risk management is in line with PTTEP's Board of Directors' directions. The Risk Management Department is responsible for ensuring risk management framework implementation and its effectiveness across the organization as well as regularly reporting the results to the management, the Risk Management Committee, and the Board for acknowledgement. The Risk Management Department is also responsible for fostering culture in managing risks throughout the organization.

9.15 Remuneration of Auditor

9.15.1 Remuneration of Auditor

(1) Audit Fee: In 2019, PTTEP and the subsidiaries, both domestic and overseas, had paid audit fees to the State Audit Office of the Kingdom of Thailand (SAO) and other auditing firms for a total of USD 1.7 million.

(2) Non-Audit Fee*: In 2019, PTTEP paid a non-audit services fee to the SAO for a total of USD 0.5 million. This fee was charged for the preparation of Comfort Letters supporting liability management of the Group for US dollar denominated debt which issued and entirely offered to offshore investors.

*Remarks: "Non-Audit Fee" is a terminology commonly used by Securities and Exchange Commission of Thailand (SEC reporting requirement).

9.15.2 Summary of the Auditors' Report for the Past Three Years (2017-2019)

The SAO expressed an unqualified opinion in the Auditors' Report on the PTTEP's consolidated financial statements for the past three years.

9.16 Other Good Corporate Governance Practices

PTTEP values and strictly abides by the 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 compliance with best practices:

(1) Since PTT holds 65.29 percent shares in PTTEP, the free-float proportion of shares is less than 40 percent 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 strictly values compliance with SEC and SET rules and criteria 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 values advance delivery of meeting notices to shareholders to allow them enough time to duly examine the data. Shareholders' meeting dates are scheduled for March every year for shareholders' convenience of planned attendance; our meeting dates do not coincide with those of other listed companies. A March date also provides shareholders with early receipt of rights and benefits, including dividends. Still, since PTTEP operates in several other countries, it takes some time to audit our financial statements, which is in the overall interests of shareholders, hence PTTEP needs to plan various report preparation well. We are able to send meeting notices to shareholders 21 days ahead of the meeting and publicize the meeting notices on our website no less than 30 days ahead of the meeting to allow shareholders time to examine meeting data in advance.

(3) Under our 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 garnering the highest votes are elected along with those holding the next highest votes, and so on until the number of available director positions are filled. PTTEP therefore does not rely on cumulative voting. Yet, all along, PTTEP has defined other methods of looking after the interests of minor 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 proxy assignments 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 defines a maximum of nine years for consecutive service by directors and independent directors. Those who completed consecutive terms totaling nine years are no longer eligible for director re-election. PTTEP also values similar consecutive periods for independent directors, for instance six years, and may take action 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) As always, PTTEP values independence of the Chairman of the Board, which is why we give a top priority to recruit the Chairman from the ranks of independent directors, except for other justification or suitability in other aspects. We also consider business expertise and proficiency, work records, and good leadership. 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 "Independence of the Chairman". 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 aspect's skills or proficiency and setting the annual target for the Skill Mix in line with prevailing business circumstances for director recruitment and development. The Board also values Board diversity by not discriminating against gender, nationality or race.

(10) PTTEP adopted best practices on defining a minimum quorum for meeting voting of no less than two-thirds of the entire Board's directors (excluding those with vested interests). PTTEP's corporate governance requires that those absent without good reason from Board meetings on more than three consecutive occasions should automatically lose qualifications as directors. PTTEP also set meeting attendance as an indicator of the Board Performance Target. PTTEP's practice is to, a year in advance, schedule Board and sub-committees meetings for the benefit of efficient planning by directors. This year more than two-thirds of the Board had perfect meeting attendance. Finally, before any voting, the Chairman gives all directors opportunities to ask questions and extensively discuss issues for a unanimous decision.

(11) Earnest appraisals of the Board of Directors and sub-committees are done through scoring on performance appraisal forms (self-appraisal and cross-appraisal), Chairman appraisal, and entire-Board appraisal; such scores complement Board Performance Target findings. Business performance and corporate governance aspects are assessed. Appraisal scores 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 IOD via its Board of the Year assessment, annual CGR survey among listed companies, and the ASEAN CG Scorecard assessment. Survey findings are applied to the Board's performance improvement.

(12) This year PTTEP held four meetings among the independent directors and two non-executive meetings for consultation and exchange of views on crucial, useful matters to the Company and shareholders (major and minor) and upgrading of corporate governance practices. The CEO was subsequently informed of the outcomes.

(13) PTTEP defined a policy on CEO and senior management compensation in agreement with their short-term and long-term performance as well as 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 has no project to award the management the right to buy PTTEP shares, but the Company instead defines a structure for suitable compensation for business, which is competitive and screened by the Remuneration Committee and the Board of Directors.

9.17 Awards and Recognitions for Good Corporate Governance

(1) Being selected to receive the NACC Integrity Award (No.8) from the Office of the National Anti-Corruption Commission (NACC). The Company has been recognized for its ethical practices, transparency, anti-corruption as well as its support for human rights and corporate social responsibility.

(2) Being selected to receive the top award in the state enterprise sector as the 2019 Role Model Organization on Human Rights from the Department of Rights and Liberties Protection, Ministry of Justice. PTTEP has been evaluated based on criteria of the United Nations Guiding Principles on Business and Human Rights, which recognizes organizations that have established guidelines for preventing human rights violations, have instilled awareness of and responsibility for human rights among personnel, have put systems in place to oversee internal departments in the company, and have created a mechanism for stakeholders to voice their grievances.

(3) Being selected to receive the Board of the Year Award 2018 (Silver) (for market capitalization over 100 billion baht) from the Thai Institute of Directors Association (IOD). This is the only award from the capital market that recognizes the top-performing boards of Thai listed companies based on their commitment to corporate governance, performance and board leadership.

(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) 2019 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 as a member of the 2019 Dow Jones Sustainability Indices (DJSI) in the DJSI World Oil and Gas Upstream & Integrated Industry for the sixth consecutive year. We have also been named the Industry Leader in this category for the second time, after our first in 2016. DJSI is a family of internationally recognized indices that evaluate the sustainability performance of the 2,500 largest global companies.

(6) Being selected as a member of the FTSE4Good Index Series for the fourth consecutive year by FTSE Russell. The FTSE4Good Index Series identifies companies that demonstrate strong Environmental, Social and Governance (ESG) practices measured against international standards. PTTEP has also ranked in the top 10 for both environmental and governance dimensions in the energy sector. The indices are used by various investors and funds for their investment decisions as well as by companies a scope for business participation in social responsibility.

(7) Being selected to receive the Best Sustainability Award and the Outstanding Investor Relations Award from SET Awards 2019, which was organized to honor listed companies with market capitalization over Baht 100 billion that presented outstanding performances. The awards were organized by The Stock Exchange of Thailand and the Money & Banking magazine. The criteria included assessment of operational performance of the preceding year and current business operations, together with responsibility for stakeholders (environment, society, and corporate governance).

Moreover, The Stock Exchange of Thailand has listed PTTEP in the 2019 Thailand Sustainability Investment (THSI) for the fourth consecutive year as a listed company that has operated its business with sustainability.

(8) Being recognized as an exemplary corporation in organizing the Annual General Meeting of Shareholders (AGM) for the year 2019 by successfully scoring 100 percent for the seventh year in the AGM checklist assessment conducted by the Thai Investors Association.

(9) Being selected to receive the Asia's Icon on Corporate Governance Award for the seventh consecutive year from the Corporate Governance Asia magazine, a financial journal on corporate governance in Hong Kong and Asia.

(10) Being selected to receive three awards from the Asian Excellence Awards 2019, namely Asia's Best CEO for the second consecutive year, Asia's Best CFO for the sixth consecutive year, and Best Investor Relations Company (Thailand) for the seventh consecutive year from the Corporate Governance Asia magazine. The Asian Excellence Awards are designed to recognize achievements and excellence in management acumen, financial performance, corporate social responsibility, environmental practices and investor relations.

(11) Being selected to receive the Thailand Energy Award 2019 in the category of energy conservation for transportation for its success on supply vessels logistics and transportation management which save more than 13.6 million litres of diesel fuel consumption per year during 2016 - 2018. This award was granted by the Department of Alternative Energy Development and Efficiency, Ministry of Energy.

(12) Being selected to receive the ISO 45001: 2018 certification for our Occupational Health and Safety Management System. This certificate recognized PTTEP's Petroleum Development Support Base (PSB) in Songkhla for implementing an effective Occupational Health and Safety Management System that meets international standards.

(13) Being selected to receive the Best Practice Award 2019 in the category of Natural Resources and Environmental Conservation from the Foundation for Thai Society. The award recognized PTTEP's excellent practices in its corporate social responsibility and the Forest Restoration for Eco-learning at Sri Nakhon Khuean Khan Park project that delivers benefit to the public and the country.

(14) Being selected to receive the PADMAMITR+ Award 2019 in the category of Partnership for Sustainability from Jakarta's Governor for the PTTEP-LKC Free Health Service Project in Rorotan Village. The project is aimed to provide underprivileged people with basic treatment and knowledge of healthy living in cooperation with Domphep Dhuafa (DD), an Indonesian non-profit organization foundation.

(15) Being selected to receive the BAZNAS award 2019 in recognition of the Best CSR Organizer from BAZNAS (The National Zakat Board) in the Republic of Indonesia. PTTEP has implemented corporate social responsibility projects and activities such as a free clinic in North Jakarta to provide medical treatment for underprivileged patients, and 15 pre-school development centers (Stimulation, Intervention, Optimization of Services for Children or SIOLA) in west Sulawesi that help develop and nurture children's health. The projects are aimed to help improve the quality of life for local communities.

(16) Being selected to receive the Best Community Development award from the Crab Hatchery Learning Center in Songkhla province, Thailand, and the Overall CSR category at the Gulf Sustainability and CSR Awards 2019, organized by the human rights independent organization of United Arab Emirates (International Humanitarian City). PTTEP is the first Thai company that wins the award.

(17) Being selected to receive the Stevie Award 2019 (Silver Class) in the category of Innovation in Community Relations for implementing a CSR Project, the H.T.M.S. Underwater Learning Site Project, at the Asia - Pacific Stevie Awards 2019, which is held in Singapore.

(18) Being selected to receive the CSR award in the category of Social Empowerment for the implementation of the Crab Hatchery Learning Center Project in Songkhla province. The award was presented at The Asia Responsible Enterprise Awards 2019 (AREA 2019) in Taipei, the Republic of China (Taiwan).

(19) Being selected to receive the Excellent Level (G-Gold) of Green Office Award 2018 from the Ministry of Natural Resources and Environment in recognition of PTTEP's Petroleum Development Support Base in Songkhla province for efficient energy and resources management. The activities were implemented under the Green Office project, initiated by the Department of Environmental Quality Promotion, Ministry of Natural Resources and Environment of Thailand.

(20) Being selected to receive the 3G Best CSR Campaign 2019 award for the H.T.M.S. Underwater Learning Site Project at the Global Good Governance (3G) Awards 2019. The event was held in Jakarta, the Republic of Indonesia.

(21) Being selected to receive an Energy and Environment Foundation Global CSR Award 2019 as a Platinum Winner for the Waste to Energy Project. The event was held in New Delhi, India.

(22) Being selected to receive three CSR awards at the 11th Annual Global CSR Summit and Awards 2019 in Kuching, Sarawak, Malaysia, including the Platinum Award for Best Country Award for Overall CSR Excellence - Best in Thailand for the overall corporate social responsibility performance, the Gold Award for Best Environmental Excellence Award (among companies with market capitalization more than USD 1 Billion) for PTTEP Teenergy Project, and the Gold Award for Best Community Programme Award (among companies with market capitalization less than USD 1 Billion) for PTTEP's Pre-school Development Project (SIOLA) in the Republic of Indonesia.

(23) Being ranked as one of the top five "Best Investor Relations in Global Energy Sector" by the IR Magazine at the IR Magazine Global Forum and Awards. The final selection was based on survey results from analysts and investors via the IR Magazine in Europe, Asia and North America.

(24) Being selected to receive "The Asset Best Investor Relations Team Award" from The Asset Magazine, Hong Kong.

(25) Being selected to receive an award for the Best Use of Multimedia for IR from the IR Magazine Awards & Conference South East Asia 2019. This award was presented to companies which demonstrate an outstanding performance in Investor Relations activities in Southeast Asia through innovative applications.

9.18 Reports of the Sub-Committees

9.18.1 The Corporate Governance Committee Report

PTTEP values the adherence to the Good Corporate Governance and Business Ethics of the PTTEP Group (CG&BE), which has continuously been improved for the Company's business operations. The Board has assigned the Corporate Governance Committee, comprising at least three directors, most of whom are independent directors, to govern and ensure that the whole organization is in compliance with the CG&BE.

In 2019, the Committee convened five 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) Assessed and reviewed the CG&BE to check whether it was still in compliance with laws, practices of international standards and those of other leading companies, and recommendations of well-recognized institutions, as well as subsequently submitting the results for the Board's approval. Detailed results included the revision of the CG&BE related to the provision added for CG&BE training as a compulsory training for all employees in order to enhance their understanding of CG&BE principles and enable employees to comply with the Company's guidelines; revision of the Business Ethics related to the Use and Storage of Electronic Data and Information Technology Resources by adding an oversight measures to cover social media use and improving the Company's practice to align with the cybersecurity and personal data protection laws; revision of the Reporting and Whistleblowing Regulation related to the subsidiaries' case-handling process to put an appropriate measure on governing both existing and new investment projects and the handling of fraud cases; providing recommendations for and considering the issuance of Remedy Guidelines to set forth clear remedial measures for any person who has been affected by whistleblowing cases, which will reassure appropriate and fair protection for every related person in the handling process.

(2) Promoted business operations of the PTTEP Group and performance of the Board, management, and employees to be sure that they are in line with the CG&BE by monitoring and providing recommendations concerning CG&BE-related activities to enhance knowledge and understanding of the CG&BE. Recommendations included setting enforced measures for employees to participate in CG&BE E-learning to encourage them to enhance their knowledge of CG&BE in order to align their behaviors with the Company's ethical standard and then reflect the Company's culture and good image; providing recommendations on the management's role model behaviors to efficiently drive the CG&BE culture in the organization; setting targets and indicators of activities' achievements; and considering any complaints received through the CG Hotline on a quarterly basis. The Committee also supported and monitored the progress of driving Governance, Risk Management and Compliance (GRC) principles in PTTEP.

(3) Valued good governance across the PTTEP Group and provided useful recommendations for the quality assurance of CG&BE implementation in new investment projects and projects in foreign countries. This was to ensure that the implementation in every area is in line with the Company's direction and a smooth transition is in place in case there is a change in operatorship. This measure was emphasized for carrying out with the related units in advance such as preparation in the Malaysia Asset where PTTEP acquired the Murphy Oil Corporation's business in Malaysia, and the acquisition of Partex from Calouste Gulbenkian Foundation in the Netherlands which focused on investments in the Middle East.

(4) Governed to ensure that PTTEP maintains its efficient and adequate system that appropriately supports the Company's anti-corruption policy, practices, and internal control systems for everyone in the organization to cultivate and also expand its practices to vendors to ensure that they abide by the CG&BE of the PTTEP Group. Supported cooperating vendors to uphold their best practices on anti-corruption, e.g., communication regarding the No-Gift Policy, VDO presentation of CG&BE and the anti-corruption policy, primarily by sending emails to vendors, as well as anti-corruption online training and a post-training quiz for vendors.

(5) Provided recommendations to and monitored the progress of PTTEP's long-term 2016–2020 Corporate Social Responsibility (CSR) and communication work plan and related activities on a quarterly basis, taking into account efficiency and effectiveness in creating sustainable growth and growing trust by PTTEP's stakeholders. As a highlight of these efforts, the Company gives high priority to CSR project expansion, the efficiency and effectiveness of CSR project implementation, the empirical measurement of activities' achievements, the readiness and rapidness of communications to stakeholders and the public, as well as the extension of new communication channels which are modern and reach more of its targets.

(6) 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 in the annual report for stakeholders.

The Corporate Governance Committee constantly reported the results of all meetings to the Board for its acknowledgement. In 2019, 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 the optimal benefit of PTTEP, the shareholders and stakeholders.

(Signed) *Admiral Tanarat Ubol*

(Tanarat Ubol)

Chairman of the Corporate Governance Committee

9.18.2 The Audit Committee Report

PTTEP is determined to conduct our E&P business with a long-term strategy to achieve sustainable growth while emphasizing the importance of fair and good corporate governance as well as benefit 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 Corporate Governance Code (CG Code) and Anti-Corruption policy to ensure that Governance, Risk management and Compliance (GRC) management remains effective in accordance with the changing business environment as well as to ensure that the Company's work processes and goals are closely monitored as we strive towards a sustainable future.

The Audit Committee consisted of four independent directors, all of whom were designated financial experts who are able to review the accuracy and reliability of financial statements. In 2019, the Committee convened 15 times, and the majority of incumbent directors attended all the meetings to discuss related matters with the management, the Company's internal and external auditors. This included the meetings with the Risk Management Committee to share information to ensure that their duties on monitoring the Company's activities were appropriate for dynamic risk. In 2019, the Committee's principal activities are 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 auditor, namely the State Audit Office of the Kingdom of Thailand, to ensure the statements' accuracy, completeness, and compliance with all relevant laws and regulations as well as generally accepted accounting standards, including International Financial Reporting Standards (IFRS). The Committee also provided recommendations in regard to the Company's Management's Discussion and Analysis (MD&A) to provide an analysis of the 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. This review comprised an assessment questionnaire as required by the Securities and Exchange Commission of Thailand (SEC), which found that the Company had incorporated a proper internal control system. 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 unfavourable 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 and the shareholders, particularly the minority shareholders. The Committee also reviewed the disclosure of the transactions and viewed that the transactions had been correctly and completely disclosed, that the prices and conditions were fair, and that the transactions had been appropriately approved by the management or the Board of Directors prior to their commencement.

(4) Review of Compliance with Laws and Related Regulations

The Committee reviewed the Company's and the subsidiaries' compliance with the securities and exchange laws, SET's regulations, including other related laws, both Thai laws and the laws of other countries in which the PTTEP Group operates or invests in. The Committee also acknowledged the compliance report relating to the Company's and our subsidiaries' business operations, as prepared by the Governance, Compliance, and Internal Control Department, in addition to the other compliance audit results reported by the Internal Audit Division.

(5) Oversight of Internal Audit Activities

The Committee considers a revision of the Audit Committee Charter and Audit Charter every year and reviews the performance according to the work plans and key performance indicators of the Internal Audit Division. It also regularly monitors the progress of the corrective or improvement actions plans in response to audit findings.

In addition, the Committee supported implementation of digitization methods to monitor and detect irregularities on a continuous basis in order to resolve matters in time, for example, the implementation of the Continuous Control Monitoring System on the Procure to Pay process. In 2019, PTTEP expanded the monitoring scope to the warehouse and the inventory management process.

The Committee promoted the adoption of digital technology to enable internal auditing to accommodate changes in the digital transformation organization, and therefore encouraged the Internal Audit Division to implement digital technology in the audit process to deliver more accurate results while also reducing time, as well as to analyze problems for more effective, direct solutions.

The Committee also considered the adequacy of manpower of the Internal Audit Division and agreed to increase the manpower in order to support the Company's business expansion and to ensure that the audit activities are carried out appropriately and effectively.

(6) Nomination of/Meeting with the External Auditor

The Committee considered the nomination of the State Audit Office of the Kingdom of Thailand as the Company's external auditor. For 2019, it determined that the external auditor had performed its duties with independence, continued to exhibit the required auditing experience, and ensured the accuracy and reliability of the Company's financial reports. In addition, the Committee proposed the audit remuneration for 2019 and met separately with the external auditor and the Internal Audit Division in the absence of the management to acknowledge and identify the auditor's approach and audit plan as well as to consider key audit matters in the auditor's report.

For the appointment of the external auditor for 2020, 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), Article 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 PricewaterhouseCoopers ABAS Limited (PwC) to be the auditor. The Committee considered that PwC is a leading company with reliable performance and independence; furthermore, the audit fee is reasonable comparable to other companies in the same business. Therefore, the Committee agreed to propose PwC to be the Company's external auditor.

(7) Oversight of Fraud Prevention

The Committee encouraged 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 management to provide an analysis of past procurement reports in order to get information for preparing annual procurement plans in advance. As a result, the proportion of bidding transactions is significantly higher than direct negotiation transactions every year. The Committee also supported reporting and whistleblowing procedures, which allow 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 has also become a certified member of Thailand's Private Sector Collective Action Coalition Against Corruption (CAC), reflecting our determination to stand strongly and prominently against corrupt practices.

The Audit Committee reported the results of all meetings to the Board on a regular basis. In 2019, the Committee conducted its work thoroughly, methodically and strictly according to the Audit Committee Charter to enhance the Company's good corporate governance. This approach and its follow-through ensured 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 2019 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 laws and all obligations by incorporating proper systems of risk management, internal controls, internal audit, and corporate governance.

The Audit Committee's performance was graded "Very Good" by itself, the Board of Directors, and related agencies.

(Signed) *Achporn Charuchinda*

(Mr. Achporn Charuchinda)

Chairman of the Audit Committee

9.18.3 The Nominating Committee Report

During the year 2019, PTTEP successfully won a significant bid round in the Gulf of Thailand covering the Bongkot and Erawan fields, acquired a producing asset in Malaysia, and built strategic partnership to expand investment opportunities in Southeast Asia and the Middle East under the “Expand” strategy. To enable the “Execute” strategy to succeed as planned, particularly transition of operations to ensure continuous production in order to serve domestic energy demand, the Nominating Committee has hence been focusing on organization readiness, organization restructuring, development of executives and employees’ competencies, and nomination of CEO and directors who are qualified, knowledgeable, and experienced fitting its core business to provide sustainable growth and long-term competitiveness.

In 2019, the Nominating Committee convened 8 times, and the essence of the meetings can be summarized below:

(1) Considered the principles for 2019 Board Performance Target in which the Board shall focus on monitoring and providing feedbacks to the management to best achieve PTTEP’s Corporate Key Performance Index (KPI) as well as measuring the stakeholders’ perspectives towards the Company including Board of the Year Awards, criteria and requirements of Dow Jones Sustainability Indices (DJSI), and the ASEAN CG Scorecard assessment.

(2) Set Target Skill Mix of the nominees in replacement of the directors who are due to retire by rotation in 2020 in the areas of Organization Change and Development, Technology, and Legal to accommodate business acquisition and internationalized business operations as well as increase technological potentiality in order to support E&P and new businesses.

(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 Shareholder’s 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 for the CEO to drive the organization’s business growth and pursuit of investment opportunities; also, reviewed the CEO’s short-term and long-term performance appraisal.

(6) Screened and commented to the Board of Directors on organization restructuring and work process to support long-term corporate growth.

(7) Developed a more concrete executive succession plan which also includes competency assessment and selection process to accommodate short-term and long-term organization growth.

The Nominating 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 2019.

(Signed) *Bundhit Eua-arporn*
(Mr. Bundhit Eua-arporn)
Chairman of the Nominating Committee

9.18.4 The Remuneration Committee Report

PTTEP's Good Corporate Governance requires the Remuneration Committee to consist of at least three directors where most of the Committee members are independent directors. The Committee's responsibility is to evaluate an appropriate remuneration for the Board, sub-committees, and the President and Chief Executive Officer (CEO), as well as the salary structure of the Company's senior executives by adhering to fair and reasonable principles, procedures, and structure.

In 2019, the Remuneration Committee convened 4 times, summarized as follows:

(1) Reviewed the remuneration policy and the salary of the Company's organization on appropriate principle based on company business in order to maintain competitiveness and support of a high-potential of Thai and foreigner to perform their duties, and also to operate with the company's Expand and Execute strategies to be more efficiently and accomplish.

(2) Considered the CEO's performance appraisal and remuneration based on appropriate to the company's performance and consistent with the overall performance of the organization.

(3) Reviewed the remuneration policy and criteria of 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 those of other companies in the same industry. Moreover, the Committee took business environment into account in considering appropriate remuneration principles to create incentives for the Board in directing the organization to achieve short and long-term goals together with being adaptive to the changing technology.

The Remuneration Committee performed its roles in a transparent, fair, cautious, and independent manner, while providing straightforward opinions for the best interests of the shareholders and stakeholders according to PTTEP's Good Corporate Governance and as specified by the Securities and Exchange Commission. The results of all meetings were also regularly reported to the Board for acknowledgement.

(Signed) *Achporn Charuchinda*

(Mr. Achporn Charuchinda)

Chairman of the Remuneration Committee

9.18.5 The Risk Management Committee Report

PTTEP recognizes the importance of risk management and adheres to effective risk management to enable PTTEP to achieve its business goal and sustainable growth. In 2019, PTTEP revised its strategies to Expand and Execute and successfully implemented the new strategies. In the Expand strategy, PTTEP focused on investments in strategic areas within the region and other prolific areas with strategic alliances. The success of this strategy is reflected in the acquisition of Murphy's business in Malaysia, shares of APICO LLC in Thailand, and Partex, which has a major investment in the Middle East. In terms of the Execution strategy, PTTEP focused on maintaining production levels of existing assets, developing projects as planned as well as effectively executing Bongkot and Erawan transition. This has led to very challenging management of risks to the achievement of PTTEP's goals, especially smooth and effective transition from previous operators as well as post-merger integration. 2019 was also the year of oil price volatility, disruptive technology, a rise in environmental concerns, changes in laws and regulations relating to PTTEP's business and operation, and an increase in cyber security. As these factors could potentially affect the achievement of PTTEP's goals or strategies, PTTEP's Board of Directors appointed the Risk Management Committee. As of December 31, 2019, the Committee comprised six members, two 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 2019, the Committee convened 14 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 dynamically changing external environment. The Risk Management Committee assessed the risks associated with the Company's "Expand and Execute" strategies, starting from defining strategic plans in the Direction and Policy Review meetings to ensure they were in line with PTTEP's vision and mission as well as managed risks that may affect the success of the implementation of strategic plans and business plans within PTTEP's Risk Appetite and Risk Limit. In addition, in 2019, the Risk Management Committee drove more strategic risk management by monitoring assumptions used in strategy formulation to ensure mitigation plans were in place to respond to any change affecting PTTEP's strategies.

(2) Considered investment projects to expand E&P investments including Merger & Acquisition, new exploration, divestment projects and portfolio rationalization in line with the Company's growth strategies (Expand), including the acquisition of Murphy's business in Malaysia and shares of APICO LLC in Thailand according to the Coming-Home Strategy as well as the acquisition of Partex according to investment expansion in other prolific areas, including the Middle East with strategic alliances. The Risk Management Committee also advised PTTEP to consider both risks and potential opportunities for value creation as well as provide recommendations to mitigate risks, including competitor and counterparty risk analysis, and post-merger & acquisition management.

(3) Considered managing risks of large development projects such as the Algeria Hassi Bir Rekaiz Project and the Mozambique Area 1 Project according to the implementation of the Execute strategy. Additionally, the Risk Management Committee raised the risk of transition execution of Bongkot and Erawan as well as post-merger integration of Murphy in Malaysia and Partex to the corporate level to closely monitor and provide recommendations, e.g. applying lessons learned from past mergers and acquisitions (M&As), assigning personnel from Corporate to supervise key tasks, and providing suggestions on risk mitigation of operations transferred from previous operators to ensure that the operations can be carried out smoothly with safety, security, health and environment (SSHE).

(4) Proactively managed risks to prevent unidentified risks from turning into problems, for instance, supporting meetings with the Audit Committee to exchange views and provide consistent guidelines, conducting lessons learned from past investments to improve investment and merger processes and be more cautious, improving corporate risk reporting to be more comprehensive and enhancing risk management performance indicators at the department and project levels.

In addition, the Risk Management Committee consistently oversaw enterprise risk management to ensure businesses were operated within PTTEP's risk appetite, particularly risks related to exploration and production operations, market, oil price, finance, and legal. The outcomes of Risk Management Committee meetings were reported to the Board on a monthly basis. The Risk Management Committee continuously promoted awareness of risk management for employees in order to foster a risk management culture as well as enhanced the level of organization readiness to cope with emerging risks, in addition to the existing corporate risks. In this regard, PTTEP has been selected as a member of the 2019 Dow Jones Sustainability Indices (DJSI) in the DJSI World Oil and Gas Upstream & Integrated Industry and maintained a DJSI score in the area of Risk and Crisis Management in the top quartile for the sixth consecutive year.

In summary, during the year 2019, the Committee independently performed its duties relating to PTTEP risk management systematically, prudently, and competently for PTTEP to efficiently manage risks within acceptable levels in order to achieve our objectives and goals for fair and maximum benefit of PTTEP, shareholders, and other stakeholders for long-term sustainability.

(Signed) *Sethaput Suthiwart-Narueput*

(Mr. Sethaput Suthiwart-Narueput)

Chairman of the Risk Management Committee

9.18.6 The Independent Directors Committee Report

Independent directors represent a crucial mechanism for corporate governance, playing a key role in ensuring corporate management transparency in the best interests of shareholders for fair distribution of benefits among all shareholders, investors, and stakeholders. PTTEP has therefore set a requirement to have independent directors more than half of the Board of Directors, a more stringent requirement than that set by the Office of the Securities and Exchange Commission (SEC), that is, a minimum of one-third of the Board.

In 2019, PTTEP successfully grew its businesses under the “Expand” strategy with the acquisition of a producing asset in Malaysia, the victorious bid round in the Gulf of Thailand, and the additional investment in exploration for sustainable growth. The independent directors gave their recommendations and comments on these to enable PTTEP to proceed with “Execute” as planned and to achieve its goals. This year, the Independent Committee convened 4 times, and the essence of the meetings can be summarized below:

(1) Reviewed to ensure that the Committee’s roles and responsibilities were in line with PTTEP’s Independent Directors Committee Charter as well as the international best practice so as to achieve best-in-class performance. PTTEP’s independent directors have performed their duties according to international best practices.

(2) 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 PTTEP for better corporate governance.

(3) Reviewed Human Resources management guidelines for the positions of corporate leaders for suitability and readiness to accommodate corporate sustainable growth.

(4) Set a frame for independent directors’ meeting standing agendas in full alignment of PTTEP’s Independent Directors Committee Charter as well as other best practices; and reviewed their own reports for distribution to all stakeholders in the annual report.

(5) Provided comments and useful enquiries with independency when considering agenda items relating to connected transactions between PTT and PTTEP to appropriately protect the benefits and rights of the Company’s minor shareholders, promoted transparency and independent decisions within the Board as well as ensured that the directors with conflicts of interest to the substance in each agenda item were abstained from the meeting and voting for the best interest of the Company, shareholders, and stakeholders.

The independent directors executed their duties through their beneficial recommendations to PTTEP and all shareholders to assist the Board of Directors to perform with highest efficiency and effectiveness.

(Signed) *Prajya Phinyawat*

(Mr. Prajya Phinyawat)

Chairman of the Independent Directors Committee

10. Corporate Social Responsibility

10.1 Operational Policies towards Responsibility for the Society and the Stakeholders

PTTEP's vision is to become an energy partner of choice through competitive performance and innovation for long-term value creation. The vision is to create sustainable values for all stakeholders. The Company aligns our sustainability practices with international standards, such as the United Nations Sustainable Development Goals (SDGs), which are globally accepted and implemented by both public and private sectors; the United Nations Global Compact Advanced Level Principles, Social Responsibility Guidance Standard: ISO 26000, Global Reporting Initiative (GRI), Dow Jones Sustainability Indices (DJSI), Sufficiency Economy Philosophy, and several other internationally accepted practices. Currently, the Company prioritizes our sustainability contributions to five SDGs, which are SDG 7, 8, 12, 13 and 14, while continuing to support the rest of the SDGs in our routine operations.

The Company has developed the Sustainable Development Policy, also known as the G.R.O.W.T.H Policy, to be adopted across the entire organization. The purpose is to demonstrate our definite sustainability objectives and determination to overcome all of the challenges towards developing and becoming a sustainable organization. For the Sustainable Development Policy, please see the Company's website (www.pttep.com).

The Company has also developed the Sustainable Development Guideline underlying various aspects which are important to sustainability of the organization in an effort to establish a universal understanding of the Company's approach to sustainability. Harmony with respect to social responsibility throughout the Company is also established by having everyone operate according to international standards and policies, such as 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 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 2019, PTTEP conducted an in-depth stakeholder engagement survey for both internal and external stakeholders to identify and prioritize material issues with respect to PTTEP. For stakeholder management, the Company has also designated each of the divisions to have its own separate responsibility and participation programs for different groups of stakeholders that they are involved with.

For more details, please see the PTTEP 2019 Sustainability Report.

10.2 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 regarding the Company's economic, environmental, and 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, to monitoring and reporting of the Company's performance. PTTEP also adopts and includes other international best practices in our sustainability report, such as DJSI best practices and requirements, AA1000 APS-AccountAbility Principles Standard (2008), 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. In 2019, the Company was able to implement the actions required to address these issues as planned.

For more details, please see the PTTEP 2019 Sustainability Report.

10.3 Impacts of Business Operation on Social Responsibility

Details are disclosed in the "Legal Dispute" section.

10.4 Projects and Activities for Benefits of the Society and the Environment (After Process)

PTTEP believes that support and trust from all relevant parties are key to sustainable organization growth. Besides business, social and environmental development projects get priority at PTTEP Operations areas, both domestic and international ones.

PTTEP social development activity and project are implemented under four themes, i.e. Basic Needs, Education, Environment and Culture.

The 5-Year CSR and Communication Roadmap (2016 - 2020) has been initiated as guidance with an emphasis on social and environmental stewardship and stakeholder value creation. The Company has been focusing on Environment and Basic Needs projects for significant positive impacts on community, environment and the Company. Sample of the projects include Crab Hatchery Learning Center Project, H.T.M.S. Underwater Learning Site Project, Technical Capability Building and Development Project, Parasite-Free Project and School-Based Integrated Rural Development Project.

For more details, please see the PTTEP 2019 Sustainability Report.

11. Internal Controls and Risk Management

11.1 Board of Directors' Evaluation of PTTEP's Internal Controls

PTTEP's Board of Directors (the Board) and management place a great emphasis on effectiveness of the internal control system. The management appoints the Internal Control Section to annually assess the adequacy and effectiveness of the system, while the Board appoints the Audit Committee to review the assessment results to ensure that the internal control system supports the Company's effective and efficient operations, provides accurate and reliable reporting, and is in compliance with relevant laws and regulations.

In 2019, the Board endorsed the Audit Committee's report on the assessment result of all of the five components of the Company's internal control system, namely (1) control environment, (2) risk assessment, (3) control activities, (4) information and communication, and (5) monitoring activities. The report stated that the Company's internal control system is adequate and effective. Moreover, when control deficiencies are detected, they are continuously corrected to support business operations to ensure that they are in compliance with laws and regulations at all times. In addition, there is an adequate internal control system in place to govern and monitor business operations of the Company's subsidiaries.

The Internal Control Self-Assessment Form provided by the Office of the Securities and Exchange Commission of Thailand (SEC) is employed to assess the Company's internal control system, which covers the five components of the framework developed by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). The assessment results are as follows:

1. Control Environment

PTTEP has an appropriate control environment which can be summarized below.

- PTTEP operates businesses under the principles of the Good Corporate Governance and Business Ethics (CG&BE), which is regularly updated to ensure compliance with international standards and best practices and considered as the highest internal regulation of the PTTEP Group. The management and employees at all levels are required to sign the commitment form to formally acknowledge the CG&BE and to act accordingly. They are also required to self-assess their conflicts of interest annually against the principles of Good Corporate Governance, which are (1) responsibility, (2) accountability, (3) fairness and integrity, (4) transparency, (5) creation of long-term value for stakeholders, and (6) promotion of best practices. These principles also include an emphasis on the rights of shareholders, equal treatment of shareholders, roles of stakeholders, and information disclosure and transparency. PTTEP also determined Business Ethics to be the best practices for all employees, for example, procurement and contracts, conflicts of interest, trade competition, anti-money laundering, anti-corruption, etc.

- In 2019, the Company continues to communicate CG&BE and the consequential penalties to ensure that it is well understood by the management and employees through various training courses, workshops, e-learning, email communications and other activities such as on CG&BE training and on the topic of Insider Trading, as well as an induction program for new directors and employees. PTTEP also publicizes CG&BE principles on the Company's website to promote and emphasize the anti-corruption policy to our joint-venture partners, suppliers/vendors and company representatives to operate

their businesses with integrity and to avoid involvement in corruption of any kind. CG&BE promotions to external parties are also communicated through lectures on the principles of Governance, Risk Management, and Compliance (GRC). We also have a clear stance to join the public sector and civil society against corruption by continually joining related events such as being a certified company of Thailand's Private Sector Collective Action against Corruption (CAC), International and National Anti-Corruption Day, etc.

- PTTEP continues to monitor and assess that the code of conduct is being followed by the Second Line of Defense and the Third Line of Defense to ensure that the management and employees can effectively integrate ethical conduct into their work life. To exemplify, Procurement and Contract operations has the Supply Chain, Procurement, and Contracts Department as their Second Line of Defense, whereas the Internal Audit Division plays an independent role as the Third Line of Defense to ensure that the operations conform to internal regulations and that the related internal control system are efficient by international standards. Additionally, PTTEP is regularly evaluated by external independent parties such as the Corporate Governance Report of Thai Listed Companies by Thai Institute of Directors Association (IOD), Dow Jones Sustainability Indices (DJSI), ASEAN Corporate Governance SCORECARD, Thailand's Private Sector Collective Action Coalition against Corruption (CAC), and the Integrity Award from The National Anti-Corruption Commission (NACC).

- PTTEP establishes a clear segregation of duties (SoD) between the Board and the management. The Board's duty is to develop corporate goals and strategies, without performing routine operations as the management do, and to govern and follow up on business performance of the management to achieve strategic plans, operational direction, objectives, and specified policies. The Board also ensures that the strategies and policies are flexible and suitable for the management to smoothly and efficiently operate appropriately under the current business environment for the Company's sustainability. Additionally, the Board has assigned the Audit Committee to govern 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 organization structure is appropriately designed in accordance to our main business of exploration and production, with flexibility and efficient collaboration that are in line with internal control principles, such as SoD, and checks and balances. In 2019, to appropriately support our business growth, the Company has conducted an organizational restructuring in related areas, for example, the restructuring of Supply Chain Procurement and Contracts Department to focus on specialization in the Electronic Government Procurement system (e-GP) as well as other product and service procurement. Moreover, the Company has established the Malaysia Asset Transition Team to support operations involved in the acquisition of Murphy Oil Company in Malaysia.

- PTTEP has appropriate reporting-line structures and hierarchy of authorities for 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 2019, PTTEP revised DAS according to the new organization structure for more effectiveness of authority delegation in related areas such as tax and procurement.

- PTTEP has an extensive set of resource management regulations and policies which focus on attracting, developing, and retaining individuals for supporting short-term and long-term organization growth. In 2019, the Company aims to prepare personnel to meet business needs as follows:

- (1) Personnel development and recruitment to support the exploration and production business by focusing on four main areas, namely mergers and acquisitions (M&A), exploration success, joint-venture management and deep-water operation.

- (2) Personnel development and recruitment to support new businesses, such as commercial, business and organization transformation, digital technology, etc.

- The Company also continuously reviews current and future manpower demand to support business growth and future expansion by especially focusing on development of existing employees. In addition, specific development plans for high potentials, management succession plans, job rotation, and promotion plans have also been developed. Employee engagement is also given importance; a survey is carried out every year to obtain current employee satisfaction levels and to create improvement plans for higher levels of employee engagement in upcoming years.

- PTTEP has an established process of employee performance appraisal and a pay-for-performance compensation system to retain highly competent individuals. Consequently, employees' merit increase, annual special payment, as well as promotion are subject to their performance appraisal results to compliment and retain those with outstanding performance and conformed attitudes with corporate values (*EP SPIRIT*). In 2019, the Company has also introduced the implementation of the 360 Evaluation system as a tool to assess a given employee's behavioral attributes against *EP SPIRIT*. The 360 Evaluation is also an essential part of an individual's Key Performance Indicator (KPI) as it helps to reflect an employee's performance in all-round aspects by including evaluations from peers and subordinates apart from direct supervisors as in previous years.

- PTTEP has established both the Internal Control Policy and the Internal Control Standard. These documents have been consistently communicated with the management and employees through training courses, activities and publication such as GRC execution, 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, appointed the Internal Control Committee as stipulated by The Rule of Ministry of Finance on Standard and Rule of Practice of Internal Control for Government Agency B.E. 2561 (2018) in order to comply with the mentioned laws and regulations.

2. Risk Assessment

PTTEP employs an international risk management approach which can be summarized below.

- PTTEP has specified a Risk Management Framework and documents related to risk management including Risk Appetite Statement, Risk Metric & Limit, and Enterprise Risk Management Policy to clearly define roles,

responsibilities, and authorities relevant to risk management at all levels of the Company, including the Board, the Risk Management Committee, and the management, as well as supporting and operational business units.

- PTTEP regularly communicates the Risk Management Standard, Guidelines, Process, and tools to the management and employees through various channels, such as employee training, workshops, and announcements on the intranet to enhance personnel's understanding and to ensure that they can apply the concept and practices to their work responsibilities in order to ensure the Company's objective achievement.

- PTTEP develops a Business Continuity Management Policy, a Business Continuity Management Standard and a Corporate Business Continuity Procedure. In 2019, 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 accordance with the ISO 22301:2012 standard as demonstrated by the following certifications at critical assets during 2019: PTTEP Myanmar Asset and PTTEP Petroleum Development Support Base (PSB) in Songkhla to maintain certification, PTTEP Headquarters in Bangkok to receive re-certification, and S1 Production Operations Department to prepare for certification application in 2020.

- PTTEP manages risk throughout the organization based on four risk categories, namely Strategic Planning and Management, Investment and Divestment Decision-Making, Capital Project Management, and Operational Business Process. In addition, the Company develops a Risk Profile to identify and assess risk at all levels, ranging from corporate, function groups, divisions, and department levels to asset/project levels.

- PTTEP clearly defines business objectives which enable risk assessment for both internal and external risk factors and evaluates the impacts and likelihood of such risk. 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 develop mitigation plans for risk that can potentially prevent the Company from achieving our business objectives.

- PTTEP appointed the Hedging Committee to oversee and efficiently manage petroleum price risk and financial risk. In 2019, the Hedging Committee convened four times.

- 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 the 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 develop internal controls corresponding to such risk with the aim to effectively improve our internal control system.

- The Company 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, etc. and (2) external factors from fluctuation risk in oil prices, foreign-exchange rates, interest rates, etc.
- PTTEP's Audit Committee assigned the Internal Audit Division (CIA) to carry out audits on high-risk areas which can lead to fraud. The Internal Audit Division is also responsible for undertaking a preliminary investigation of any suspected fraud cases upon receipt of a report, or as requested by the Audit Committee and/or the President and Chief Executive Officer (CEO).
- PTTEP regularly monitors and reviews strategic plans to ensure that the business goals remain reasonable and consistent with the changing situations. The Company closely monitored changes of key factors such as oil prices, global and domestic economies, geopolitics, foreign exchange rates, laws and regulations, government policies, technological advancements, especially in alternative energy, which currently plays a bigger role in the energy industry, to respond to those changes in a timely manner.

3. Control Activities

PTTEP has adequate and efficient control activities to appropriately manage and mitigate risk to an acceptable level. Our key control activities can be summarized as follows:

- PTTEP has extensive sets of written regulations and policies which the management and employees must strictly comply with, whereas the management and supervisors are responsible for governing and monitoring compliance with such specifications. In 2019, to ensure higher work efficiency within the organization, the Company developed and updated corporate policies, standards and guidelines to improve work efficiency, such as policies in Internal Control and Business Continuity Management, and the Standard of PTTEP Group Governance and Subsidiary Management for Business related to Power & Energy, etc.
- PTTEP recognizes the significance of control activities at the process level, including SoD and review and authorization of transactions, to ensure that the Company's business operations are efficient and able to prevent fraudulent acts. In 2019, 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 regarding control self-assessment (CSA) such as the Anti-Corruption Process and Procurement Value up to 15,000 USD (Low-Value Purchase) Process. 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.
- PTTEP develops general controls over technology and physical equipment, including data backup and recovery to ensure business continuity from any disruption. An IT security policy was announced across organization in keeping with good corporate governance. In 2019, the Company initiated various information system activities that would support operational security and flexibility, for instance, the appointment of a PTT Group Cybersecurity Governance & Assurance Project Committee to

elevate the cybersecurity system of the entire PTT Group, the implementation of the Microsoft Office 365 system for better convenience of information access, etc. Digital Security Awareness E-Learning was also carried out to foster staff awareness and understanding that the corporate IT security policy, regulations, and Thailand's Computer-related Crime Act B.E. 2550 (2007) must be strictly followed.

- PTTEP establishes information technology (IT) infrastructure control and a clear policy for implementation of digital technology to ensure IT system effectiveness according to the standards of COBIT5, which is a business framework for governance and management of IT, and ISO 27001, which is an information security standard. In 2019, the Company considered the use of an IT system on Cloud platform for the purposes of flexibility and convenience, while still continuing security and efficiency as specified by PTTEP.

- PTTEP emphasizes the IT security policy and controls for IT risk to maintain system stability and prevent the Company from security breach. A data backup and recovery system is also provided to ensure business continuity. The controls can be classified into three types, namely (1) Control at General Level, such as common IT guidelines and procedures, Business Continuity Plan on IT areas, (2) Control at Personal Level, such as personal access controls, Cybersecurity Drill, trainings on Cybersecurity Act and Personal Data Protection Act for employees at all levels, and (3) Control at System Level, such as log keeping of each user's system usage as required by law and External Penetration Testing by an expert organization for system vulnerability improvement.

- PTTEP appointed the 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 subsidiaries, associated companies and joint ventures by assigning the Company's management and employees to manage these entities. The Company has developed Subsidiary Directors Guidelines for the assigned persons to ensure standardized Subsidiary Directors' Roles and Responsibility. The Internal Audit Division also has the responsibilities to audit Assets/Projects in which the Company has invested. During 2019, PTTEP established the Standard of PTTEP Group Governance and Subsidiary Management for Business related to Power & Energy, which also indicates roles and responsibilities of nominated PTTEP representatives to serve as directors in joint-venture companies. The Standard also specifies areas of agenda that requires approval from within PTTEP prior to voting in a joint-venture company's meeting.

- PTTEP regularly reviews policies, requirements and work processes to ensure that work processes and defined control activities are effectively and efficiently managed against relative risk when changes occur. In 2019, the Company revised policies, requirements and work processes for greater efficiency, such as the issuance of Compliance Manual to provide a tool for complying with internal and external laws and regulations. For internal regulations, the owners of those documents are held responsible in ensuring compliance with the stated requirements. Another example is the revision of the PTTEP Group Document Management System, as well as the documents' relative SoDs. This also includes appropriate revisions of DAS in the Company's regulations, policies, standards, procedures, and guidelines.

4. Information and Communication

PTTEP has effective and efficient information and communication systems for internal and external stakeholders which can be summarized as follows:

- PTTEP validates data and information from internal and external sources after being reviewed by responsible units before making decisions. In addition, the Company imposes the confidentiality of usage and 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. In 2019, PTTEP specified approval authority in sending important or confidential information to external parties under DAS so that disclosure of important information to external parties is being controlled appropriately.
- 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. The Company communicates objectives and responsibility of internal control through internal meetings and emails. PTTEP has also set up the "Call Tree" network for communication when any crisis arises. During 2019, the Company promoted the GRC concept to the management and employees through GRC Workshops to ensure that they can appropriately integrate this concept into their work responsibilities. Furthermore, lessons-learned cases about punishment from misconduct have also been communicated to all employees to minimize repetitions.
- 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 2019, the Company provided assorted information to stakeholders, such as the announcement of new "Energy Partner of Choice" corporate vision, expansion of investments in the Middle East and Southeast Asia which is in accordance with our strategic direction, etc. We also provided information publications for analysts, fund managers and shareholders to enhance better understanding of the E&P business. We have also launched our new communication channel, PTTEP Investor Relations Mobile Application, this year. Besides, the Company also published the CEO Message column for investors and analysts via PTTEP Website, Facebook and LinkedIn. The Safety, Security, Health and Environment (SSHE) Policy and CG&BE, which includes PTTEP's Anti-Corruption Policy, have been communicated to suppliers/vendors through various communication channels, such as the PTT Group CG Day.
- 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, facsimile, email, and the Company's official website.

5. Monitoring Activities

PTTEP has adequate and efficient monitoring systems which can be summarized as follows:

- PTTEP regularly monitors and assesses internal controls to ensure that they can appropriately respond to dynamic business environments from corporate and technical risk. In 2019, the Company monitored GRC-related activities through the annual GRC Plan to effectively implement the GRC framework within the organization.
- PTTEP uses two levels of CSA, namely (1) corporate and (2) process levels. For the corporate level, CSA is based on the Internal Control Self-Assessment Form provided by the Office of the Securities and Exchange Commission of Thailand (SEC) as well as the internal control questionnaires assessed by management at all levels. For the process level, owners of business processes with significant impacts on the Company are required to assess controls of such processes. Findings from the two levels of CSA are subsequently used to develop improvement plans and continuous follow-ups. The CSA Guideline was also revised in 2019 to be more practical and appropriate.
- The Governance, Compliance, and Internal Control Department is responsible for monitoring, reviewing, and reporting two types of compliance circumstances within an organization, namely (1) compliance with external laws and regulations via compilation of Non-Compliance Reporting. The results shall be reported to the CEO and the concerned top management and the Audit Committee on a monthly and semi-annually basis, respectively, (2) compliance with internal regulations and policies by gathering reports on internal regulation compliance from operational areas with higher risk. The results shall then reported to the CEO and the concerned top management on a monthly basis. For non-compliance cases with significant impacts on the PTTEP Group, the management will make further appropriate consideration on reporting to the Board of Directors for acknowledgement.
- The Internal Audit Division (CIA) is responsible for auditing and providing recommendations for improvement to ensure adequacy and effectiveness of the internal control system. CIA is also responsible for developing improvement plans to resolve the issues identified and subsequently communicate with responsible parties, while regularly reporting the findings and improvement progress to the Audit Committee.
- Moreover, PTTEP's whistleblowing channel is another method of monitoring and assessing the Company's CG&BE implementation.

11.2 Head of the Internal Audit Division and Head of the Compliance Function

11.2.1 Roles and Responsibilities of 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 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 for frauds, 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 create opportunities for frauds as well as to provide recommendations for enhancement of the internal controls.

(2) Joint Venture Audits

The auditors conduct audits 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, that they possess appropriate internal controls, and that 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 benefit 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 the investigation of all reported or suspected frauds, according to 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 held the positions of Acting Senior Vice President of the Internal Audit Division and Head of the Internal Audit Division during January – October 2019. Since November 1, 2019, Ms. Jutima Lalitkul has assumed these positions. The Audit Committee deems that both aforementioned executives are qualified to undertake the responsibility based on their educational background, necessary knowledge, skills, and work experiences. They both have 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.

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.

11.2.2 Roles and Responsibilities of Head of the Compliance Department Function

PTTEP has established the Governance, Compliance and Internal Control 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, Assurance, and Transformation Group, and the President & CEO. The key responsibilities are to encourage the PTTEP Group to fully comply with applicable laws as well as to support the management in managing compliance risk efficiently through various compliance programs, including provision of communication and training programs, developing and maintaining of the legislation database, identifying and conducting compliance risk assessment, providing advice upon new issuance or amendment of the PTTEP Group's internal regulations, coordinating with regulators, and reporting the performance of the compliance programs to the Audit Committee and the management.

Head/Vice President of the Compliance Department Function in 2019:

Mr. Kanee Supyaboonrod has been appointed as the Vice President of the Compliance Department, having already functioned in this position from October 1, 2018 to December 31, 2018. He has been appointed as the Vice President of the Governance, Compliance and Internal Control Department since January 1, 2019.

More details of the Head of the Compliance Department Function are disclosed in Attachment 3: Details of Head of the Internal Audit Division and Head of the Compliance Department.

12. Connected Transactions

12.1 Connected Transactions between Related Companies

Connected transactions at PTTEP and/or our subsidiaries with other entities that may result in conflicts of interest in the fiscal year ending December 31, 2019 are as follows:

Connected Company	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
PTT Public Company Limited (PTT)	<ul style="list-style-type: none"> • PTT, the Company's major shareholder, holds 65.29% of the Company's registered and paid-up capital. • PTT's executives who serve as PTTEP's directors are: <ol style="list-style-type: none"> (1) Mr. Chansin Treenuchagron (2) Mr. Atikom Terbsiri (3) Mr. Phongstorn Thavisin 	Petroleum product sales: crude oil; natural gas; liquefied petroleum gas; and condensate <ul style="list-style-type: none"> ▪ Total income ▪ Accounts receivable 	4,917.40 535.94	<ul style="list-style-type: none"> • Condition and price setting follows normal business operations, at an arm's length basis for non-related persons or operations.
		Other income includes: <ul style="list-style-type: none"> • 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 natural gas purchase/sale contract. • Income from the jetty and warehouse rentals at Songkhla base • Income from the Company's personnel seconded to PTT 		<ul style="list-style-type: none"> • Condition and price setting follows normal business operations, at an arm's length basis for non-related persons or operations.

Connected Company	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
		<ul style="list-style-type: none"> • Income from service charges for management's drivers based on the agreement between PTT and PTTEP Services (a subsidiary of PTTEP) • Income from service charges for dismantling of natural gas meter of S1 project • Income from equipment inspection provided by AI and Robotics Ventures Company Limited (ARV) (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 	<p style="text-align: right;">15.99</p> <p style="text-align: right;">5.13</p>	
		Purchase of petroleum products and related expenses, manpower charges for PTT personnel seconded to the Company and subsidiaries, and other expenses <ul style="list-style-type: none"> ▪ Total expenses ▪ Accounts payables 	<p style="text-align: right;">4.58</p> <p style="text-align: right;">0.40</p>	<ul style="list-style-type: none"> • Condition and price setting for the purchase of petroleum products, related equipment, related services, and other expenses follows 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 Sale Agreement	<p style="text-align: right;">1.76</p>	<ul style="list-style-type: none"> • Condition and price setting follows normal business operations at an arm's length basis for non-related persons or operations.

Connected Company	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
Energy Complex Company Limited (EnCo)	<ul style="list-style-type: none"> • 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 Company's personnel seconded to EnCo and Dividend income <ul style="list-style-type: none"> ▪ Total income ▪ Accounts receivable 	2.67 0.14	<ul style="list-style-type: none"> • Manpower rates are based on the actual rates the Company pays to employees seconded to EnCo.
		The Company has signed a three-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 three years. <ul style="list-style-type: none"> ▪ Total lease and service expenses ▪ Accounts payable 	19.06 0.03	<ul style="list-style-type: none"> • 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.
		The Company signed a loan contract with EnCo under the following conditions: <ul style="list-style-type: none"> • Contract period of 13 years and 6 months • Expiration date is October 2, 2022. • Reference interest rate follows the loan contract between EnCo and Krung Thai Bank Public Company Limited, dated April 2, 2009 (contract amendment is included.) The interest rate as of December 31, 2019 is FDR+2% per year, total 3.35% p.a. <ul style="list-style-type: none"> ▪ Interest receivable ▪ Loans outstanding 	0.65 19.26	<ul style="list-style-type: none"> • The mentioned contract follows the conditions of the loan contract signed by EnCo and Krung Thai Bank Public Company Limited, dated April 2, 2009 (contract amendment is included.) with the financial support of all of EnCo's shareholders proportionately.

Connected Company	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
PTT Digital Solutions Company Limited (PTT Digital) (Formerly is PTT ICT Solutions Company Limited.)	<ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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 condition and parking provided by EnCo (a subsidiary of PTTEP) <ul style="list-style-type: none"> ▪ Total income 4.12 ▪ Accounts receivable 0.29 		<ul style="list-style-type: none"> • Manpower rates are based on the actual rates the Company pays to employees seconded to PTT Digital.
		The Company and subsidiaries have signed a contract with PTT Digital for IT services and communications. <ul style="list-style-type: none"> ▪ Total expenses 23.56 ▪ Accounts payable 3.54 		<ul style="list-style-type: none"> • Condition and price setting follows normal business operations at an arm's length basis for non-related persons or operations.
PTT Energy Resources Company Limited (PTTER)	<ul style="list-style-type: none"> • 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 condition and parking provided by EnCo (a subsidiary of PTTEP) <ul style="list-style-type: none"> ▪ Total income 0.15 ▪ Accounts receivable 0.0016 		<ul style="list-style-type: none"> • Condition and price setting follows normal business operations at an arm's length basis for non-related persons or operations.
PTT Energy Solutions Company Limited (PTTES)	<ul style="list-style-type: none"> • PTT, the Company's major shareholder, holds 40% of PTTES's registered and paid-up capital. • GC, TOP and IRPC hold 20% each of PTTES's registered and paid-up capital. 	Expense from seminars, training and system consultants. <ul style="list-style-type: none"> ▪ Total expenses 0.0062 ▪ Accounts payable - 		<ul style="list-style-type: none"> • Condition and price setting follows normal business operations at an arm's length basis for non-related persons or operations.
Business Services Alliance Company Limited (BSA)	<ul style="list-style-type: none"> • PTT, the Company's major shareholder, holds more than 10% of BSA's registered and paid-up capital. 	Income from office building rentals and services provided by EnCo (a subsidiary of PTTEP) <ul style="list-style-type: none"> ▪ Total income 0.13 ▪ Accounts receivable 0.0024 		<ul style="list-style-type: none"> • Condition and price setting follows normal business operations, at an arm's length basis for non-related persons or operations.

Connected Company	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
		Expenses from the following services: <ul style="list-style-type: none"> • Expenses for field trip arrangements • Manpower charges for BSA personnel seconded to PTTGL (a subsidiary of PTTEP) • Manpower charges for BSA personnel providing services at (1) Energy Complex, (2) PTT headquarters, (3) PTT Research and Technology Institute in Wangnoi District, Phra Nakhon Si Ayutthaya Province and (4) PTT Research and Technology Institute in Wang Chan District, Rayong Province based on the agreement between BSA and EnCo (the subsidiary of PTTEP) <ul style="list-style-type: none"> ▪ Total expenses 0.57 ▪ Accounts payable 0.06 		<ul style="list-style-type: none"> • Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
Sport Services Alliance Company Limited (SSA)	<ul style="list-style-type: none"> • PTT, the Company's major shareholder, holds more than 10% of BSA's registered and paid-up capital. • BSA holds 100% of SSA's registered and paid-up capital. 	Income from office building rentals and facility service such as water, electricity, air condition and parking provided by EnCo (a subsidiary of PTTEP) <ul style="list-style-type: none"> ▪ Total income 0.0004 ▪ Accounts receivable - 		<ul style="list-style-type: none"> • Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
		Sponsorship to Rayong Football Club <ul style="list-style-type: none"> ▪ Total expenses 0.06 ▪ Accounts payable - 		<ul style="list-style-type: none"> • Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.

Connected Company	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
IRPC Public Company Limited (IRPC)	<ul style="list-style-type: none"> • PTT, the Company's major shareholder, holds 38.51% of IRPC's registered and paid-up capital. • Co-director is Mr. Chansin Treenuchagron. 	Income from the following services: <ul style="list-style-type: none"> • Income from the jetty and warehouse rentals at Songkhla base • Income from office building rentals and facility service such as water, electricity, air condition and parking provided by EnCo (a subsidiary of PTTEP) • Income from drone services provided by AI and Robotics Ventures Company Limited (ARV) (a subsidiary of PTTEP) <ul style="list-style-type: none"> ▪ Total income 1.79 ▪ Accounts receivable 0.02 		<ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> ▪ Total expenses 0.0002 ▪ Accounts payable 0.0001 		<ul style="list-style-type: none"> • 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)	<ul style="list-style-type: none"> • PTT, the Company's major shareholder, holds 13.33% of TIP's registered and paid-up capital. 	Income from the following services: <ul style="list-style-type: none"> • Insurance claims for Arthit project • Income from office building rentals and facility service such as water, electricity, air condition and parking provided by EnCo (a subsidiary of PTTEP) <ul style="list-style-type: none"> ▪ Total income 3.19 ▪ Accounts receivable 3.09 		<ul style="list-style-type: none"> • Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.

Connected Company	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 <ul style="list-style-type: none"> ▪ Total expenses ▪ Accounts payable 	8.63 0.22	<ul style="list-style-type: none"> • 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)	<ul style="list-style-type: none"> • PTT, the Company's major shareholder, holds 49.10% of TOP's registered and paid-up capital. 	Income from office building rentals and facility service such as water, electricity, air condition and parking provided by EnCo (a subsidiary of PTTEP) <ul style="list-style-type: none"> ▪ Total income ▪ Accounts receivable 	1.08 0.02	<ul style="list-style-type: none"> • Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
		Donations for bowling charity <ul style="list-style-type: none"> ▪ Total expenses ▪ Accounts payable 	0.0020 -	<ul style="list-style-type: none"> • Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
PTT Global Chemical Public Company Limited (GC)	<ul style="list-style-type: none"> • PTT, the Company's major shareholder, holds 48.18% of GC's registered and paid-up capital. 	Income from the following services: <ul style="list-style-type: none"> • Income from meeting room rentals • Income from office building rentals and facility service such as water, electricity, air condition and parking provided by EnCo (a subsidiary of PTTEP) <ul style="list-style-type: none"> ▪ Total income ▪ Accounts receivable 	2.65 0.06	<ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> ▪ Total expenses ▪ Accounts payable 	0.0038 0.0002	<ul style="list-style-type: none"> • Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.

Connected Company	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
PTT Natural Gas Distribution Company Limited (PTT NGD)	<ul style="list-style-type: none"> PTT, the Company's major shareholder, holds more than 10% of PTT NGD's registered and paid-up capital. 	Income from the following services: <ul style="list-style-type: none"> Income from service charges for the management's drivers based on in the agreement between PTT NGD and PTTEP Services (a subsidiary of PTTEP) Income from office building rental and facility service such as water, electricity, air condition and parking provided by EnCo (a subsidiary of PTTEP) <ul style="list-style-type: none"> Total income Accounts receivable 	0.19 0.0023	<ul style="list-style-type: none"> Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
PTT Retail Business Company Limited (PTTRM)	<ul style="list-style-type: none"> PTT, the Company's major shareholder, holds more than 10% of PTTRM's registered and paid-up capital. 	Income from office building rental and facility service such as water, electricity, air condition and parking provided by EnCo (a subsidiary of PTTEP) <ul style="list-style-type: none"> Total income Accounts receivable 	0.04 0.0040	<ul style="list-style-type: none"> Condition and price setting follows 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) <ul style="list-style-type: none"> Total expenses Accounts payable 	0.0066 0.0001	<ul style="list-style-type: none"> 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)	<ul style="list-style-type: none"> PTT, the Company's major shareholder, holds more than 10% of PTT Tank's registered and paid-up capital. 	Income from office building rentals and facility service such as water, electricity, air condition and parking provided by EnCo (a subsidiary of PTTEP) <ul style="list-style-type: none"> Total income Accounts receivable 	0.02 0.0008	<ul style="list-style-type: none"> Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.

Connected Company	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
Trans Thai-Malaysia (Thailand) Limited (TTM)	<ul style="list-style-type: none"> PTT, the Company's major shareholder, holds more than 10% of TTM's registered and paid-up capital. 	Income from the following services: <ul style="list-style-type: none"> Income from warehouse rentals at Songkhla base Income from office building rentals and facility service such as water, electricity, air condition and parking provided by EnCo (a subsidiary of PTTEP) <ul style="list-style-type: none"> Total income Accounts receivable 	0.02 0.0031	<ul style="list-style-type: none"> 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)	<ul style="list-style-type: none"> PTT, the Company's major shareholder, holds 100% of PTTT's registered and paid-up capital. 	Income from oil price hedging contracts <ul style="list-style-type: none"> Total income Accounts receivable 	4.00 0.95	<ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Total expenses Accounts payable 	4.26 2.24	<ul style="list-style-type: none"> Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
PTT International Trading London Ltd. (PTTT LDN)	<ul style="list-style-type: none"> PTT, the Company's major shareholder, holds 100% of PTTT LDN's registered and paid-up capital. 	Petroleum product sales: crude oil <ul style="list-style-type: none"> Total income Accounts receivable 	66.79 -	<ul style="list-style-type: none"> Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.

Connected Company	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
PTT Regional Treasury Center (PTT RTC)	<ul style="list-style-type: none"> PTT, the Company's major shareholder, holds 100% of PTT RTC's registered and paid-up capital. 	<p>PTTGL Investment Limited (PTTGLI), a subsidiary of PTTEP, signed a loan contract with PTT RTC under the following conditions:</p> <ul style="list-style-type: none"> Contract period of 6 years and 10 months Expiration date is July 2, 2024. Interest rates refer to the LIBOR plus Interest Rate Spread which are in line with market rates. <p>On December 23, 2019 PTTGLI repaid loan to PTT RTC and signed a new loan contract with PTT Treasury Center Company Limited (PTT TCC).</p> <ul style="list-style-type: none"> Interest expenses Loans outstanding 	<p>1.54</p> <p>-</p>	<ul style="list-style-type: none"> 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 PTTGLI's shareholders proportionately.
Global Power Synergy Company Limited (GPSC)	<ul style="list-style-type: none"> PTT, the Company's major shareholder, holds 22.58% of GPSC's registered and paid-up capital. 	<p>Income from the following services:</p> <ul style="list-style-type: none"> Income from demolition and installation of office equipment, and leasing office space for Enco B, Floor 18th (684 sq.m.) Income from office building rentals and facility service such as water, electricity, air condition and parking provided by EnCo (a subsidiary of PTTEP) Income from manpower charges based on the agreement between GPSC and PTTEP Services (a subsidiary of PTTEP) Income from drone services provided by AI and Robotics Ventures Company Limited (ARV) (a subsidiary of PTTEP) <ul style="list-style-type: none"> Total income Accounts receivable 	<p>1.01</p> <p>0.05</p>	<ul style="list-style-type: none"> Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.

Connected Company	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
PTTGL Investment Limited (PTTGLI)	<ul style="list-style-type: none"> • PTT, major shareholder of PTTEP and PTTGL, hold 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: <ul style="list-style-type: none"> • Contract period of 6 years and 10 months • Expiration date is July 2, 2024. • Interest rates refer to the LIBOR plus Interest Rate Spread which are in line with market rates. On December 23, 2019 PTTGLI repaid loan to PTTEP Treasury Center and signed a new loan contract with PTTEP Treasury Center under the following conditions: <ul style="list-style-type: none"> • Contract period of 4 years and 6 months • Expiration date is July 2, 2024. • Interest rates refer to the LIBOR plus Interest Rate Spread which are in line with market rates. <ul style="list-style-type: none"> ▪ Interest income 3.14 ▪ Loans outstanding 66.82 		<ul style="list-style-type: none"> • 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.
		The Company and subsidiaries signed contracts with PTTGLI for the following services: <ul style="list-style-type: none"> • Accounting, Tax and Financial Operations services provided by PTTEP • Financial services provided by PTTEP Treasury Center Company Limited <ul style="list-style-type: none"> ▪ Total income 0.09 ▪ Accounts receivable 0.0073 		<ul style="list-style-type: none"> • Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.

Connected Company	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
PTT LNG Company Limited (PTTLNG)	<ul style="list-style-type: none"> 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 condition and parking provided by EnCo (a subsidiary of PTTEP) <ul style="list-style-type: none"> Total income 0.08 Accounts receivable 0.0010 		<ul style="list-style-type: none"> Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
PTT Oil and Retail Business Public Company Limited (PTTOR) (Formerly is PTT Retail Management Company Limited "PTTRB")	<ul style="list-style-type: none"> PTT, the Company's major shareholder, holds 100% of PTTOR's registered and paid-up capital. 	Income from the following services: <ul style="list-style-type: none"> Income from sublease of office space at floor 6th, EnCo building A and floor 18th, EnCo building B (total 1,927 sq.m.) and other services provided by PTTEP Income from utility services Income from drone and inspection services provided by AI and Robotics Ventures Company Limited (ARV) (a subsidiary of PTTEP) Income from office building rental and facility service such as water, electricity, air condition and parking provided by EnCo (a subsidiary of PTTEP) <ul style="list-style-type: none"> Total income 2.00 Accounts receivable 0.72 		<ul style="list-style-type: none"> Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
		Expenses from the following services: <ul style="list-style-type: none"> Purchase of petroleum products and related expenses Manpower charges for PTTOR personnel seconded to EnCo (a subsidiary of PTTEP) <ul style="list-style-type: none"> Total expenses 49.84 Accounts payable 3.96 		<ul style="list-style-type: none"> Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.

Connected Company	Relationship	Transaction	Value (Unit: Million USD)	Pricing Policy and/or Reason
PTT Treasury Center Company Limited (PTT TCC)	<ul style="list-style-type: none"> PTT, the Company's major shareholder, holds 100% of PTT TCC's registered and paid-up capital. 	PTTGLI (a subsidiary of PTTEP) signed a loan contract with PTT TCC under the following conditions: <ul style="list-style-type: none"> Contract period of 4 years and 6 months Expiration date is July 2, 2024. Interest rates refer to the LIBOR plus Interest Rate Spread which are in line with market rates. <ul style="list-style-type: none"> Interest expenses Loans outstanding 	0.03 33.41	<ul style="list-style-type: none"> 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 PTTGLI's shareholders proportionately.
Global Management Holding Company Limited (Global Management Holding)	<ul style="list-style-type: none"> PTT, the Company's major shareholder, holds 100% of Global Management Holding's registered and paid-up capital. 	Income from installation of company nameplate on the 2 nd floor of Building F, EnCo provided by EnCo (a subsidiary of PTTEP) <ul style="list-style-type: none"> Total income Accounts receivable 	0.000003 0.000003	<ul style="list-style-type: none"> Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.
Siam Management Holding Company Limited (Siam Management Holding)	<ul style="list-style-type: none"> PTT, the Company's major shareholder, holds 100% of Siam Management Holding's registered and paid-up capital. 	Income from installation of company nameplate on the 2 nd floor of Building F, EnCo provided by EnCo (a subsidiary of PTTEP) <ul style="list-style-type: none"> Total income Accounts receivable 	0.000003 0.000003	<ul style="list-style-type: none"> Conditions and price setting follow normal business operations, at an arm's length basis for non-related persons or operations.

Remarks: Please see historical data of 2018 and 2017 for 3 years comparison from the Company's website.

12.2 Preconditions and Reasons for Connected Transactions

PTTEP's Audit Committee reviewed the connected transactions which were recorded during the fiscal year ending December 31, 2019 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) prior to execution.

12.3 Measures and Procedure of Connected Transactions

The Board reviews any transactions potentially leading to conflicts of interest, or those which are connected or related, under proper ethical standards, however only after they are initially screened and examined by the Company's Audit Committee. The transactions are particularly those falling within the criteria as set forth by The Stock Exchange of Thailand, the Capital Market Supervisory Board, and the Securities and Exchange Commission. The Board's responsibility also includes, when deemed appropriate, public disclosure of accurate and correct information of the transactions which might be questionable. The Company meanwhile has conducted a clear set of policies regarding conflict of interest for our directors and employees to follow and act accordingly, as well as a reporting process in the conflict of interest.

Shall any of the directors, employees, or related persons have a vested interest in a transaction that the Company is involved in, he or she will not be allowed to take part in the making any of the decisions or approvals related to the transaction. The transaction, in this case, also remains to be treated under an arm's length basis, fair and justifiable in terms of both price and conditions.

12.4 Policy for and Future Possibility of Connected Transactions

12.4.1 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, 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.

12.4.2 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 continue.

13. Significant Financial Information

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

	As at January 1, 2018		As at December 31, 2018		As at December 31, 2019	
	(Brought forward)		(Restated)			
	(Restated)					
	Thousand (USD)	%	Thousand (USD)	%	Thousand (USD)	%
Assets						
Current Assets						
Cash and cash equivalents	1,512,181	7.9	3,180,095	16.3	2,822,897	12.7
Short-term investments	2,955,491	15.4	820,530	4.2	200,000	0.9
Investments in trading securities	208	0.0	70,550	0.4	213,703	1.0
Investments in available-for-sales securities	-	-	10,450	0.1	-	-
Account receivable - parent company	566,569	3.0	637,129	3.3	534,837	2.4
Trade accounts receivable	109,434	0.6	87,251	0.4	258,926	1.2
Other accounts receivable	78,595	0.4	471,386	2.4	121,501	0.5
Inventories	19,186	0.1	23,402	0.1	32,095	0.2
Materials and supplies	298,064	1.5	258,825	1.3	298,241	1.3
Current tax assets	89,007	0.5	44,251	0.2	55,338	0.2
Other current assets	136,101	0.7	152,199	0.8	175,752	0.8
Total Current Assets	5,764,836	30.1	5,756,068	29.5	4,713,290	21.2
Non-current Assets						
Investments in available-for-sales securities	713	0.0	557	0.0	524	0.0
Investments in associates	212,644	1.1	219,797	1.1	227,626	1.0
Investments in joint ventures	18,721	0.1	17,412	0.1	225,370	1.0
Other long-term investments	11	0.0	224	0.0	345	0.0
Long-term loans to related parties	110,498	0.6	95,495	0.5	86,056	0.4
Property, plant and equipment	8,034,375	42.0	8,203,148	42.1	10,661,985	48.0
Goodwill	1,167,584	6.1	1,244,242	6.4	2,060,856	9.3
Intangible assets	83,988	0.4	82,092	0.4	131,976	0.6
Exploration and evaluation assets	3,066,536	16.0	3,071,910	15.8	2,639,486	11.9
Deferred tax assets	416,117	2.2	462,550	2.4	961,729	4.4
Rights to receive reimbursement from decommissioning funds	131,356	0.7	161,721	0.8	237,265	1.1
Other non-current assets	125,204	0.7	168,906	0.9	254,994	1.1
Total Non-current Assets	13,367,747	69.9	13,728,054	70.5	17,488,212	78.8
Total Assets	19,132,583	100.0	19,484,122	100.0	22,201,502	100.0

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

	As at January 1, 2018		As at December 31, 2018		As at December 31, 2019	
	(Brought forward)		(Restated)			
	(Restated)					
	Thousand (USD)	%	Thousand (USD)	%	Thousand (USD)	%
Liabilities and Equity						
Current Liabilities						
Trade accounts payable	115,353	0.6	102,656	0.5	107,065	0.5
Working capital to co-venturers	15,641	0.1	17,579	0.1	12,440	0.0
Current portion of long-term financial liabilities	399,710	2.1	407,015	2.1	18,281	0.1
Accrued expenses	490,906	2.6	596,428	3.1	749,646	3.4
Accrued interests payable	24,151	0.1	16,275	0.1	19,775	0.1
Income tax payable	406,005	2.1	678,133	3.5	862,953	3.9
Short-term provision	63,424	0.3	133,674	0.7	131,500	0.6
Deferred considerations acquired through business acquisition	-	-	465,972	2.4	-	-
Financial derivative liabilities	25,521	0.2	10,685	0.0	15,214	0.1
Other current liabilities	60,545	0.3	57,364	0.3	133,969	0.6
Total Current Liabilities	1,601,256	8.4	2,485,781	12.8	2,050,843	9.3
Non-current Liabilities						
Debentures	1,938,720	10.2	1,537,767	7.9	2,704,746	12.2
Long-term loans	568,731	3.0	986	0.0	718,675	3.2
Deferred tax liabilities	890,888	4.7	781,885	4.0	1,358,710	6.1
Provision for employee benefits	123,773	0.6	135,264	0.7	245,248	1.1
Provision for decommissioning costs	2,275,433	11.9	2,243,655	11.5	2,967,512	13.4
Provision for remuneration for the renewal of petroleum production	195,015	1.0	238,661	1.2	190,758	0.9
Deferred income	7,360	0.0	4,957	0.0	5,035	0.0
Financial derivative liabilities	7,459	0.0	-	-	-	-
Other non-current liabilities	22,401	0.1	49,767	0.3	118,801	0.5
Total Non-current Liabilities	6,029,780	31.5	4,992,942	25.6	8,309,485	37.4
Total Liabilities	7,631,036	39.9	7,478,723	38.4	10,360,328	46.7
Equity						
Share capital						
Issued and paid-up share capital	150,684	0.8	150,684	0.8	150,684	0.7
Share premium	3,439,037	18.0	3,439,037	17.7	3,439,037	15.5
Subordinated capital debentures	1,154,812	6.0	1,154,687	5.9	187,435	0.8
Retained earnings						
Appropriated						
Legal reserve	15,048	0.1	15,048	0.1	15,048	0.1
Reserve for expansion	431,231	2.3	431,231	2.2	431,231	1.9
Unappropriated	6,339,800	33.1	6,847,837	35.1	7,630,675	34.4
Other components of equity	(29,065)	(0.2)	(33,125)	(0.2)	(12,936)	(0.1)
Total Equity	11,501,547	60.1	12,005,399	61.6	11,841,174	53.3
Total Liabilities and Equity	19,132,583	100.0	19,484,122	100.0	22,201,502	100.0
Book value per share (USD)	2.90		3.02		2.98	
Issued and fully paid-up capital at the end of year (Thousand share)	3,969,985		3,969,985		3,969,985	

PTT EXPLORATION AND PRODUCTION PUBLIC COMPANY LIMITED AND SUBSIDIARIES
 STATEMENTS OF INCOME
 FOR THE YEARS ENDED DECEMBER 31,

	2017		2018		2019	
	Thousand (USD)	%	Thousand (USD)	%	Thousand (USD)	%
Revenues						
Sales	4,281,205	94.7	5,202,810	95.3	6,046,416	94.3
Revenue from pipeline transportation	77,805	1.7	107,564	2.0	116,396	1.8
Gain on foreign exchange	51,402	1.1	-	-	108,597	1.7
Interest income	59,579	1.3	83,353	1.5	86,235	1.3
Gain on financial derivatives	-	-	13,966	0.3	-	-
Other income	53,273	1.2	50,784	0.9	55,391	0.9
Total Revenues	4,523,264	100.0	5,458,477	100.0	6,413,035	100.0
Expenses						
Operating expenses	625,061	13.8	645,084	11.8	750,682	11.7
Exploration expenses	52,194	1.2	45,685	0.8	128,098	2.0
Administrative expenses	251,371	5.6	290,234	5.3	383,776	6.0
Petroleum royalties	367,858	8.1	469,663	8.6	546,334	8.5
Depreciation, depletion and amortization	1,650,220	36.5	1,848,511	33.9	2,026,056	31.6
Loss on foreign exchange	-	-	18,632	0.3	-	-
Loss on financial derivatives	28,407	0.6	-	-	109,400	1.7
Impairment loss on assets	558,214	12.3	-	-	-	-
Other expenses	-	-	57,768	1.1	-	-
Finance costs	226,227	5.0	238,565	4.4	234,979	3.7
Total Expenses	3,759,552	83.1	3,614,142	66.2	4,179,325	65.2
Share of profit of associates and joint ventures	9,745	0.2	7,932	0.1	12,352	0.2
Profit before income taxes	773,457	17.1	1,852,267	33.9	2,246,062	35.0
Income taxes	(179,571)	(4.0)	(732,658)	(13.4)	(676,998)	(10.5)
Profit for the year from continuing operations	593,886	13.1	1,119,609	20.5	1,569,064	24.5
Loss for the year from discontinued operations - net of tax	(348)	(0.0)	-	-	-	-
Profit for the year	593,538	13.1	1,119,609	20.5	1,569,064	24.5
Basic earnings (loss) per share (USD)						
Continuing operations	0.13		0.27		0.38	
Discontinued operations	(0.0001)		-		-	

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

	2017	2018	2019
	Thousand (USD)	Thousand (USD)	Thousand (USD)
Cash flows from operating activities			
Continuing operations			
Profit before income taxes	773,457	1,852,267	2,246,062
Adjustment to reconcile profit before income taxes to net cash provided by (used in) operating activities			
Share of profit of associates and joint ventures	(9,746)	(7,932)	(12,352)
Depreciation, depletion and amortization	1,650,220	1,848,510	2,026,056
Impairment loss on assets	558,214	-	-
Other provision	-	11,005	8,133
(Reversal of) increase in allowance for decrease in value of inventory to net realizable value	(9,323)	1,643	(1,364)
Write-off of exploration assets	25,936	673	76,756
Other amortized expenses	7,730	11,975	32,050
Loss on disposal of assets	33,559	17,369	19,049
Income recognized from deferred income	(5,922)	(5,457)	(3,541)
Loss (gain) on financial derivatives	9,447	(35,470)	57,850
Provision for employee benefits	12,232	13,395	35,252
(Gain) loss on foreign exchange	(5,361)	8,006	(8,014)
Interest income less than interest expenses	162,879	147,262	147,107
Loss from divestment of asset	-	57,768	-
	3,203,322	3,921,014	4,623,044
Change in operating assets and liabilities	(534,420)	(644,147)	(1,103,438)
Net cash flows provided by operating activities	2,668,902	3,276,867	3,519,606
Cash flows from investing activities			
Continuing operations			
Cash paid for short-term investments	(4,415,788)	(1,652,635)	(744,750)
Cash received from investing in short-term investments	3,442,374	3,786,110	1,365,410
Cash received (paid) for investment in available-for-sale securities	-	(10,444)	10,444
Cash paid for long-term loans to related parties	(92,750)	-	-
Cash received for long-term loans to related parties	-	15,129	10,801
Cash paid for business acquisition	-	(652,852)	(2,713,300)
Cash prepayment for business acquisition	-	(397,780)	-
Net cash (paid) received from divestment of asset	-	133,092	(19,627)
Cash paid for investment in associate	(156,609)	-	-
Cash paid for investment in joint ventures	-	-	(79,412)
Cash received from investment in joint ventures	393	1,049	-
Cash paid for investment in other long-term investment	(11)	-	(36)
Dividends received from related parties	5,275	5,437	14,716
Interest received from short-term investments	27,730	39,797	15,376
Interest received from loans	575	3,335	5,218
Increase in property, plant and equipment	(1,331,920)	(1,081,485)	(1,063,093)
Increase in intangible assets	(6,164)	(11,695)	(26,147)
Increase in exploration and evaluation assets	(22,845)	(60,773)	(119,228)
Net cash flows (used in) provided by investing activities	(2,549,740)	116,285	(3,343,628)

PTT EXPLORATION AND PRODUCTION PUBLIC COMPANY LIMITED AND SUBSIDIARIES
STATEMENTS OF CASH FLOWS (cont'd)
FOR THE YEARS ENDED DECEMBER 31,

	2017	2018	2019
	Thousand (USD)	Thousand (USD)	Thousand (USD)
Cash flows from financing activities			
Continuing operations			
Cash received from short-term loan	-	-	259,581
Cash paid for repayment of short-term loan	-	-	(258,826)
Cash paid for repayment of debentures	-	(403,742)	(418,199)
Cash paid for repayment of long-term loans	-	(575,135)	(7,785)
Interest paid for debentures and loans	(133,512)	(128,372)	(109,932)
Cash paid for redemption of subordinated capital debentures	(874,311)	-	(990,846)
Cash received from issuance of subordinated capital debentures	854,695	-	-
Finance costs paid for issuance of subordinated capital debentures	(66)	(1,226)	-
Interest paid for subordinated capital debentures	(52,826)	(57,696)	(53,611)
Cash received from long-term loans	-	-	600,000
Cash received from issuance of debentures	-	-	1,130,045
Finance costs paid for issuance of debentures and long-term loans	-	-	(7,613)
Net cash received (paid) for financial derivative contract	-	(2,395)	1,353
Dividends paid	(458,570)	(555,702)	(697,760)
Net cash flows used in financing activities	(664,590)	(1,724,268)	(553,593)
Net (decrease) increase in cash and cash equivalents	(545,428)	1,668,884	(377,615)
Cash and cash equivalents at the beginning of the year	2,039,500	1,512,181	3,180,095
	1,494,072	3,181,065	2,802,480
Adjustment for the effect of exchange rate changes	18,109	(970)	20,417
Cash and cash equivalents at the end of the year	1,512,181	3,180,095	2,822,897

Summary significant financial ratio table

			2017	2018	2019
			(Restated)	(Restated)	
Liquidity ratio					
Current Ratio	Times		3.60	2.32	2.30
Quick Ratio	Times		3.21	1.90	1.86
Cash Flow from Operations to Current Liabilities Ratio	Times		1.98	1.60	1.55
Account Receivable Turnover	Times		7.68	7.58	8.12
Collection Period	Days		48	48	45
Profitability Ratio					
Net Profit Margin	%		13.12	20.51	24.47
Return on Equity	%		5.19	9.53	13.16
Efficiency Ratio					
Return on Assets	%		3.12	5.80	7.53
Return on Fixed Assets	%		19.21	26.33	29.00
Assets Turnover	Times		0.24	0.28	0.31
Financial Policy Ratio					
Debt to Equity Ratio	Times		0.25	0.16	0.29
Net Debt to Equity Ratio	Times		(0.14)	(0.17)	0.04
Times Interest Earned	Times		13.54	16.18	18.53
Dividend Ratio	%		90	55	49
Data per Share					
Book Value per Share	USD		2.90	3.02	2.98
Net Profit per Share	USD		0.13	0.27	0.38
Dividend per Share	THB		4.25	5.00	6.00
Growth Rate					
Total Asset	%		1.28	1.84	13.95
Total Liabilities	%		1.68	(2.00)	38.53
Sales	%		2.42	21.83	16.05
Net Profit	%		59.53	88.63	40.14

14. Management Discussion and Analysis of Operating Results

14.1 Executive Summary

PTTEP has operated through the strategies, “Expand and Execute”, to create and achieve sustainable growth. In 2019, PTTEP’s continual achievements in operation and expansion include the successful bidding of petroleum exploration and production rights for Block G1/61 (Erawan field) and Block G2/61 (Bongkot field) in the Gulf of Thailand; the acquisition of Murphy’s business in Malaysia; the acquisition of Partex Holding B.V. (Partex) who holds major investments in the largest producing oil asset in Oman; the significant discovery of gas in Sarawak SK 410B Project in Malaysia; the Final Investment Decision (FID) of the Mozambique Area 1 Project and the Algeria Hassi Bir Rekaiz Project. As a result, PTTEP has hit a record average sales volume in 2019 of 350,651 barrels of oil equivalent per day (BOED) and expects the compound annual growth rate (CAGR) of sales volume during 2020 – 2025 to be at 6%. PTTEP’s proved reserves increased to 1,140 million barrels of oil equivalent (MMBOE) at end of 2019, resulting in a reserves life (proved reserves to production ratio) of 7.5 years as targeted.

In 2020, PTTEP plans to allocate a greater focus on “Execute” which entails maintaining sales volume from legacy assets; ensuring smooth operational transitions of recently acquired assets i.e. G1/61 Project, G2/61 Project, assets in Malaysia and under Partex group, ensuring development projects to deliver first production as planned, progressing SK410B’s milestone into FID stage; and accelerating exploration activities of projects in Malaysia and Myanmar for long-term reserves addition.

With the objective to become a truly “Sustainable Organization”, PTTEP’s Sustainable Development Framework (SD Framework) is aligned with international practices under the concept, FROM “WE” to “WORLD”, for sustainable growth and sustainable value creation to all stakeholders. The SD Framework is structured to drive the organization along with the strategy “Expand and Execute”, with three main components including High Performance Organization (HPO), Governance, Risk Management and Compliance (GRC) and Stakeholder Value Creation (SVC), in line with the vision of being the “Energy Partner of Choice”

For 2019, PTTEP reported net income of 1,569 MMUSD, an increase of 40% compared to the previous year. This is mainly driven by higher sales volume as a result of the additional stake in Bongkot and business acquisitions of both Murphy’s business in Malaysia and Partex Holding. In addition, PTTEP’s financial structure remains robust and equipped to accommodate new investment opportunities as reflected from the positive cash flows generated from operations of 3,540 MMUSD and the healthy EBITDA margin of 71%. As of year-end 2019, PTTEP reported total assets of 22,202 MMUSD, of which 3,023 MMUSD was cash and short-term investments, while total liabilities were reported at 10,361 MMUSD of which 3,442 MMUSD was interest-bearing debt. Total shareholders’ equity ended at 11,841 MMUSD with debt to equity ratio at 0.29.

Summary of Key Financial Results

(Unit : MMUSD)	2019	2018	% Inc. (Dec.) YTD	Q3 2019	Q4 2019	Q4 2018	% Inc. (Dec.) QoQ	% Inc. (Dec.) YoY
Total Revenue	6,413	5,459	17	1,593	1,841	1,557	16	18
Sales Revenue	6,046	5,203	16	1,494	1,755	1,411	17	24
EBITDA	4,354	3,860	13	1,054	1,188	1,024	13	16

(Unit : MMUSD)	2019	2018	% Inc. (Dec.) YTD	Q3 2019	Q4 2019	Q4 2018	% Inc. (Dec.) QoQ	% Inc. (Dec.) YoY
Profit (loss) for the period	1,569	1,120	40	358	384	269	7	43
Basic earnings per share (USD)	0.38	0.27	39	0.09	0.09	0.07	0	29
Profit (loss) from normal operation	1,445	1,215	19	303	379	283	25	34
Profit (loss) from non-recurring items	124	(95)	>100	55	5	(14)	(91)	>100

14.2 Economic Overview in 2019

(1) Crude Oil Prices

Crude oil price is one of the major factors affecting the Company's performance. In 2019, average Dubai crude price fell to \$63.5 per barrel, lower than 2018 average price of \$69.7 per barrel (Source: Platts). Crude price was also volatile and reached the highest at the level of \$70 per barrel in the first half of this year. This was mainly due to US sanctions against Iran over its nuclear program which caused the uprising in the Strait of Hormuz, an important passageway for Middle East crude oil exports. Crude price then fell and remained at the level of \$60 per barrel however, pressured by concerns on the global economy, the uncertainty from US-China trade war, and Brexit. Consequently, manufacturing and trade numbers of major countries continuously declined and generated the lowest global oil demand growth in 8 years. In addition, increased global oil supply contributed to the price pressure, driven mainly by US production growth after completion of multiple oil pipelines in 2H/2019.

However, during Q4/2019, Dubai crude price gradually recovered and closed at \$67.3 per barrel by year end as demand-supply balance started to improve. On the demand side, global economic figures slightly recovered as tensions from the US-China trade war started to ease. In addition, there was less concern on the supply side as OPEC and non-OPEC members agreed on a deeper production cut to 1.7 million barrels per day from 1.2 million barrels, in 2020. Meanwhile, tense geopolitics in the Middle East significantly increased supply disruption risks, especially after the drone attack incident on Saudi Arabia's oil facilities in September 2019. US production also showed signs of lower-than-estimated growth as oil companies became more financially disciplined and thus less aggressive on drilling activities due to concerns on global economic outlook.

(2) Liquefied Natural Gas (LNG)

For the LNG Market in 2019, the average Asian spot price decreased to 5.51 USD per MMBTU, mainly driven by the falling oil price and the oversupply situation in the market as a result of additional volumes from new projects sanctioned in the past 5 years. This year's supply had increased by 44 MTPA compared to last year, mainly attributable to LNG projects in the US, Australia, and Russia with total production capacity of 360 MTPA while LNG demand remained at 351 MTPA, driven by higher demand from China and India.

(3) Thailand's Energy Demand

Thailand's energy demand from January to October 2019 was reported at 2.17 million BOED, an increase of 0.1% over the same period last year (Source: EPPO, The Ministry of Energy) due to increases in private and government investment. However, both import and export levels have declined. For energy consumption by fuel types, the energy usage from oil and natural gas increased while the usage of coal, lignite, hydro, and imported electricity decreased.

(4) Exchange Rates (Thai Baht against US Dollar)

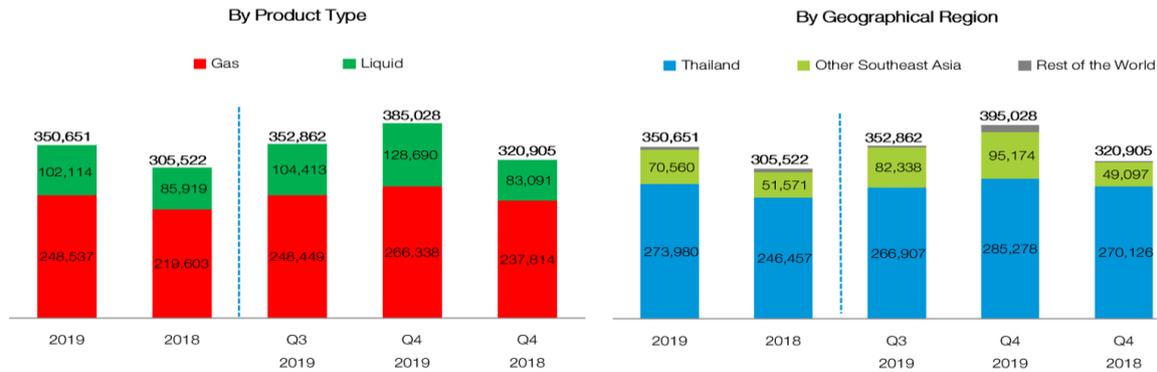
In 2019, THB outperformed against USD, strengthening from 32.45 at end of 2018 to 30.15 by end of 2019. The Bank of Thailand is closely monitoring the situation and has introduced balancing monetary measures to support Thailand's export capabilities and foreign investments level. Such measures include two policy rate reductions during the year and measures to support fund flows and THB conversion. THB continues to strengthen however, driven mainly by global economic instability from the intensified US-China trade war and Federal Reserve's rate cuts which weakened the USD. These factors directed capital flows into safe assets, which include Thailand due to Thailand's political stability from clarity in government establishment at the beginning of year. Additionally, Thailand maintains a current account surplus, due to a larger import reduction over export reduction, and a high FX reserve level relative to other countries in the region.

In terms of financial performance, PTTEP is affected by THB fluctuations mainly in the form of income tax filing due to the difference in tax filing currency (THB) and functional currency (USD) according to accounting standards. However, in April 2019, amendments were made on relevant tax laws, that allow tax to be filed in the company's functional currency, after obtaining Revenue Department's approval. This will reduce impact of FX movements. PTTEP has received such approval and has switched the tax filing currency to USD according to the Petroleum Income Tax Act since Q2/2019. However, for other companies in PTTEP's Group, tax filings continue to be in THB until receiving further approval from Revenue Department; as a result, the impact of foreign exchange volatility on financial statements remains but in a reduced magnitude.

14.3 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)	2019	2018	% Inc. (Dec.) YTD	Q3 2019	Q4 2019	Q4 2018	% Inc. (Dec.) QoQ	% Inc. (Dec.) YoY
Average selling price (/BOE)	47.24	46.66	1	46.03	48.28	47.79	5	1
Liquid price (/BOE)	61.18	67.40	(9)	58.77	61.94	66.01	5	(6)
Gas price (/MMBTU)	6.92	6.42	8	6.78	6.95	6.90	2	1
Average Dubai crude oil price (/BBL)	63.51	69.65	(9)	61.26	62.03	68.30	1	(9)

For the year ended 2019 compared with the year ended 2018

For 2019, average sales volume of PTTEP and its subsidiaries (the “Group”) increased to 350,651 barrels of oil equivalent per day (BOED) when compared with the year ended 2018 (In 2018: 305,522 BOED). The increase was primarily from Bongkot Project due to the additional acquisition of participating interest, the acquisition of Murphy’s business in Malaysia and acquisition of Partex Holding B.V. (Partex). The average selling price increased to 47.24 USD/BOE (in 2018: 46.66 USD/BOE).

For Fourth quarter of 2019 compared with Third quarter of 2019

In Q4/2019, the Group had an average sales volume of 395,028 BOED. An increase from Q3/2019 of 352,862 BOED was primarily from the Bongkot Project, as there is no shutdown activities in Q4/2019 while there were shutdown days from maintenance activities in Q3/2019. In addition, the increase in sales volumes was due to the acquisition of Partex in Q4/2019 and an increase in crude oil sales from Malaysia Project. The average selling price in Q4/2019 increased to 48.28 USD/BOE (Q3/2019: 46.03 USD/BOE).

For Fourth quarter of 2019 compared with Fourth quarter of 2018

When compared the average sales volume for Q4/2019 to Q4/2018 of 320,905 BOED, the average sale volume increased primarily due to the acquisition of Murphy’s business in Malaysia and acquisition of Partex in Q3/2019 and Q4/2019 respectively, and from the Bongkot Project, as there was no shutdown activities in Q4/2019 while there were shutdown days from maintenance activities in Q4/2018. The average selling price in Q4/2019 also increased to 48.28 USD/BOE (Q4/2018: 47.79 USD/BOE).

14.3.1 Overall Operating Results

For the year ended 2019 compared with the year ended 2018

For 2019, the Group had a net profit of 1,569 MMUSD, an increase of 449 MMUSD or 40% from a net profit in 2018 of 1,120 MMUSD. The net profit consists of the profit from normal operation of 1,445 MMUSD and profit from non-recurring items of 124 MMUSD.

The profit from normal operation for the year ended 2019 was 1,445 MMUSD, an increase of 230 MMUSD from a profit for the year ended 2018 of 1,215 MMUSD. The reason was primarily due to an increase in sales revenue of 843 MMUSD from increases in an average sales volume and selling price. However, total expenses increased mainly from an increase in depreciation, depletion and amortization expenses of 178 MMUSD due to an increase in average production from the acquisition of additional participating interest in Bongkot project in Q2/2018 and the acquisition of Murphy's business in Malaysia during Q3/2019, as well as an increase in operating expenses of 106 MMUSD, mainly due to the acquisition of Murphy's business in Malaysia. Moreover, exploration expenses increased 82 MMUSD from an increase in exploration wells written-off.

With the consideration of the profit from non-recurring items of 2019, the Group reported a profit of 124 MMUSD, an increase of 219 MMUSD when compared with 2018 which reported a loss of 95 MMUSD. The reason was primarily due to Thai Baht against US Dollar in 2019 was more appreciation than in 2018, resulting in a decrease of income taxes expenses relating to changes in foreign exchange rate of 187 MMUSD, offsetting with a reversal of income taxes benefits balance relating to functional currency which was previously recognized as of 31 December 2018 for the Company amounting to 60 MMUSD in accordance with the announcement of Petroleum Income Tax Act (No.9) B.E. 2562 in April 2019, as well as, there was a gain on exchange rate of 109 MMUSD in 2019, while the Group recognised a loss on such transaction of 19 MMUSD in 2018. Besides, the Group did not recognize loss on assets divestment (Montara field) in 2019, while there was a recognition of such transaction of 58 MMUSD in 2018, as well as, there was a derecognition of deferred tax assets in Australia amounting to 54 MMUSD. However, there was a loss on financial derivatives of 109 MMUSD in 2019, while the Group recognized gain from such transaction of 14 MMUSD in 2018, mainly from forward contract and oil price hedging instrument.

For Fourth quarter of 2019 compared with third quarter of 2019

For Q4/2019, the Group reported a net profit of 384 MMUSD, an increase of 26 MMUSD or 7% from a net profit in Q3/2019 of 358 MMUSD. The net profit consists of the profit from normal operation of 379 MMUSD and profit from non-recurring items of 5 MMUSD.

The profit from normal operation for Q4/2019 was 379 MMUSD, an increase of 76 MMUSD when compared with the profit for Q3/2019 of 303 MMUSD. The reason was primarily due to an increase in sales revenue of 261 MMUSD from increases in average sales volume and selling price. However, there was an increase in total expenses mainly from an increase in operation expenses of 100 MMUSD, primarily from the recognition of expenses from Malaysia Project and Partex group due to the acquisition of Murphy's business in Malaysia, as well as, the acquisition of Partex Holding B.V. Depreciation, depletion and amortization expenses increased 66 MMUSD due to an increase in production from Malaysia project and Bongkot project, as well as, Partex group from acquisition of Partex Holding B.V.

With the consideration of the profit from non-recurring items of Q4/2019 of 5 MMUSD, a decrease of 50 MMUSD when compared with the profit for Q3/2019 of 55 MMUSD. The reason was primarily due to the recognition of loss on financial derivatives of 41 MMUSD in Q4/2019, while the Group recognized gain from such transaction of 22 MMUSD in Q3/2019, mainly due to an oil price hedging and forward contract. However, income tax expenses decrease 29 MMUSD, mainly due to higher of an appreciation of Thai Baht against US Dollar in Q4/2019 when compared with Q3/2019.

For Fourth quarter of 2019 compared with fourth quarter of 2018

When compared a net profit for Q4/2019 with the same period last year which reported a net profit of 269 MMUSD, the Group had an increase in profit of 115 MMUSD or 43%, which can be separated to the following.

The profit from normal operation for Q4/2019 was 379 MMUSD, an increase of 96 MMUSD when compared with a profit for Q4/2018 of 283 MMUSD. The reason was primarily due to an increase in sales revenue of 344 MMUSD from increases in an average sales volume and selling price. However, there was an increase in total expenses, primarily from an increase in operating expenses of 112 MMUSD, mainly due to the acquisition of Murphy's business in Malaysia and acquisition of Partex Holding B.V. The depreciation, depletion and amortization expenses increased 94 MMUSD, mainly due to the acquisition of Murphy's business in Malaysia and higher production volume from Bongkot project.

With the consideration of the profit from non-recurring items of Q4/2019, the Group reported a profit of 5 MMUSD, an increase of 19 MMUSD when compared with Q4/2018 which reported a loss of 14 MMUSD. The reason was primarily due to an appreciation of Thai Baht against US Dollar in Q4/2019, while there was a depreciation of Thai Baht against US Dollar in Q4/2018, resulting in a decrease of 45 MMUSD in income tax expense relating to changes in foreign exchange rate and there was an increase in gain on exchange rate of 38 MMUSD. Besides, the Group did not recognize loss on assets divestment (Montara field) and the derecognition of deferred tax assets in Australia in Q4/2019, while there were recognition of such transactions in Q4/2018. However, the Group recognized loss on financial derivatives of 41 MMUSD in Q4/2019, while there was a gain on such translation of 72 MMUSD in Q4/2018 which mainly due to oil price hedging.

14.3.2 Operating Results by Segments

Net Profit (loss) (Unit : MMUSD)	2019	2018	% Inc. (Dec.) YTD	Q3 2019	Q4 2019	Q4 2018	% Inc. (Dec.) QoQ	% Inc. (Dec.) YoY
Exploration and Production	1,342	954	41	292	395	229	35	72
Thailand	1,236	1,073	15	298	343	303	15	13
Overseas	106	(119)	>100	(6)	52	(74)	>100	>100
- Other Southeast Asia	132	59	>100	4	68	18	>100	>100
- Australia	(15)	(151)	90	(7)	(1)	(89)	86	99
- America	(10)	(27)	63	(3)	(2)	(5)	33	60
- Africa	14	(0.2)	>100	4	(7)	2	>(100)	>(100)
Others	(15)	-	(100)	(4)	(6)	-	(50)	(100)
Midstream	1	-	100	-	1	-	100	100
Pipeline Transportation	292	230	27	72	62	7	(14)	>100
Head Office and Others	(66)	(64)	(3)	(6)	(74)	33	>(100)	>(100)
Total	1,569	1,120	40	358	384	269	7	43

For the year ended 2019 compared with the year ended 2018

For 2019, the Group reported a net profit of 1,569 MMUSD, an increase of 449 MMUSD or 40% from a net profit of 1,120 MMUSD in 2018, primarily due to an increase of Exploration and Production segment in Thailand of 163 MMUSD, Australia of 136 MMUSD and Other Southeast Asia of 73 MMUSD.

(1) Exploration and Production Segment

(1.1) Thailand

For 2019, Thailand segment reported a net profit of 1,236 MMUSD, an increase of 163 MMUSD or 15% from a net profit of 1,073 MMUSD in 2018, primarily due to an increase in sales revenue, mainly from an increase in average sales volume, while there was an increase in depreciation, depletion and amortization expenses which mainly derived from the acquisition of additional participating interests of the Bongkot Project in Q2/2018, as well as, there was an increase in income tax expense of 60 MMUSD, derived from a reversal of income tax benefits relating to functional currency for the Company in accordance with the announcement of Petroleum Income Tax Act (No.9) B.E. 2562 in April 2019.

(1.2) Australia

For 2019, Australia segment reported a net loss of 15 MMUSD, a decrease of 136 MMUSD or 90% from a net loss of 151 MMUSD in 2018, primarily due to there was no recognition of loss on assets divestment (Montara field) and no derecognition of deferred tax assets in Australia in 2019, while there were such transactions in 2018.

(1.3) Other Southeast Asia

For 2019, Other Southeast Asia reported a net profit of 132 MMUSD, an increase of 73 MMUSD or more than 100% from a net profit of 59 MMUSD in 2018, primarily due to the acquisition of Murphy's business in Malaysia during Q3/2019.

For the fourth quarter 2019 compared with third quarter of 2019

In Q4/2019, the Group reported a net profit of 384 MMUSD, an increase of 26 MMUSD or 7% from a net profit of 358 MMUSD in Q3/2019, primarily due to an increase of the Exploration and Production segment in Other Southeast Asia of 64 MMUSD and Thailand of 45 MMUSD, while there was a decrease in Head Office and Others segment of 68 MMUSD.

(1) Exploration and Production Segment

(1.1) Other Southeast Asia

In Q4/2019, Other Southeast Asia reported a net profit of 68 MMUSD, an increase of 64 MMUSD or more than 100% from a net profit of 4 MMUSD in Q3/2019, primarily due to the acquisition of Murphy's business in Malaysia and a decrease in exploration expenses as there was no exploration wells written-off in Q4/2019.

(1.2) Thailand

In Q4/2019, Thailand segment reported a net profit of 343 MMUSD, an increase of 45 MMUSD or 15% from a net profit of 298 MMUSD in Q3/2019, primarily due to an increase in sales revenue, mainly from increases in average sales volume and selling price, while there was an increase in depreciation, depletion and amortization expenses.

(2) Head Office and Others segment

In Q4/2019, Head Office and Others segment reported a net loss of 74 MMUSD, an increase of 68 MMUSD or more than 100% from a net loss of 6 MMUSD in Q3/2019, primarily due to a decrease in financial derivatives (recognized loss in Q4/2019 while recognized gain in Q3/2019), mainly from oil price hedging and forward contracts.

For the Fourth quarter of 2019 compared with fourth quarter of 2018

In Q4/2019, the Group reported a net profit of 384 MMUSD, an increase of 115 MMUSD or 43% from a net profit of 269 MMUSD in Q4/2018, primarily due to an increase of the Exploration and Production segment in Australia of 88 MMUSD, Other Southeast Asia of 50 MMUSD and Thailand of 40 MMUSD, while there was a decrease of Head Office and Others segment of 107 MMUSD.

(1) Exploration and Production Segment

(1.1) *Australia*

In Q4/2019, Australia segment reported a net loss of 1 MMUSD, a decrease of 88 MMUSD or 99% from a net loss of 89 MMUSD in Q4/2018, primarily due to there was no recognition of loss on assets divestment (Montara field) and no derecognition of deferred tax assets in Australia in 2019, while there were such transactions in Q4/2018.

(1.2) *Other Southeast Asia*

In Q4/2019, Other Southeast Asia reported a net profit of 68 MMUSD, an increase of 50 MMUSD or more than 100% from a net profit of 18 MMUSD in Q4/2018, primarily due to the acquisition of Murphy's business in Malaysia during Q3/2019.

(1.3) *Thailand*

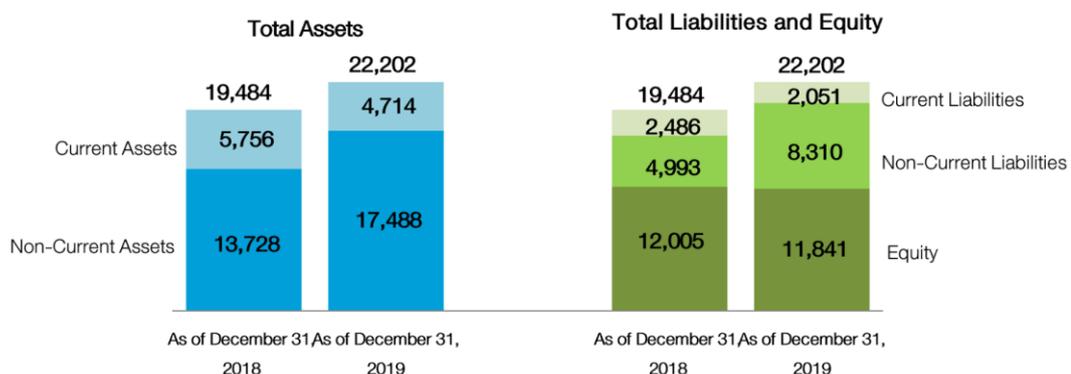
In Q4/2019, Thailand segment reported a net profit of 343 MMUSD, an increase of 40 MMUSD or 13% from net profit of 303 MMUSD in Q4/2018, primarily due to an increase in sales revenue, mainly from an increase in average sales volume, while there were increases in operation expenses and depreciation, depletion and amortization expenses.

(2) Head Office and Others Segment

In Q4/2019, Head Office and Others segment reported a net loss of 74 MMUSD, a decrease of 107 MMUSD or more than 100% from a net profit of 33 MMUSD in Q4/2018, primarily due to a decrease in financial derivatives (recognized loss in Q4/2019 while recognized gain in Q4/2018), mainly from oil price hedging.

14.3.3 Financial Position

Unit: Million US Dollar



(1) Assets

As at December 31, 2019, the Group had total assets in the amount of 22,202 MMUSD, an increase of 2,718 MMUSD from total assets as at December 31, 2018 of 19,484 MMUSD, primarily due to;

(1.1) Current assets, which were primarily comprised of cash and cash equivalents, short-term investments, account receivable – parent company, account receivable and investments in trading securities, decreased 1,043 MMUSD mainly due to decreases in short-term investments of 621 MMUSD, cash and cash equivalents of 357 MMUSD and other accounts receivable of 350 MMUSD.

(1.2) Non-current assets, which were primarily comprised of exploration and production assets in joint venture projects being recognized as part of the property, plant and equipment, exploration and evaluation assets and goodwill, increased 3,760 MMUSD mainly due to increases in assets being recognized as part of property, plant and equipment, intangible assets and exploration and evaluation assets of 2,076 MMUSD and goodwill of 817 MMUSD, primarily due to the acquisition of Murphy's business in Malaysia and acquisition of Partex, as well as an increase in deferred tax assets of 499 MMUSD.

(2) Liabilities

As at December 31, 2019, the Group had total liabilities of 10,361 MMUSD, an increase of 2,882 MMUSD from total liabilities as at December 31, 2018 of 7,479 MMUSD, primarily due to;

(2.1) Current liabilities, which were primarily comprised of income tax payable, accrued expenses, short-term provision and other current liabilities, decreased 435 MMUSD mainly due to a decrease in deferred considerations acquired through business acquisition of 466 MMUSD.

Non-current liabilities, which were primarily comprised of provision for decommissioning costs, debentures and deferred tax liabilities, increased 3,317 MMUSD mainly due to an issuance of new debentures 1,167 MMUSD and an increase in long-term borrowing of 718 MMUSD, as well as, increases in provision for decommissioning costs and deferred tax liabilities of 724 MMUSD and 577 MMUSD, respectively, mainly due to the acquisition of Murphy's business in Malaysia and acquisition of Partex.

(3) Capital Structure

As of December 31, 2019, the capital structure consisted of 11,841 MMUSD in shareholders' equity and 10,361 MMUSD in total liabilities.

Relative to the previous year, shareholders' equity decreased by 164 MMUSD, from 12,005 MMUSD on December 31, 2018, to 11,841 MMUSD. The decrease was primarily a result of the Company's redemption of 969 MMUSD worth of subordinated perpetual capital debentures, as well as the Company's dividend payments of 698 MMUSD for the Company's second-half-year-operations of 2017 and first-half-year-operations of 2018.

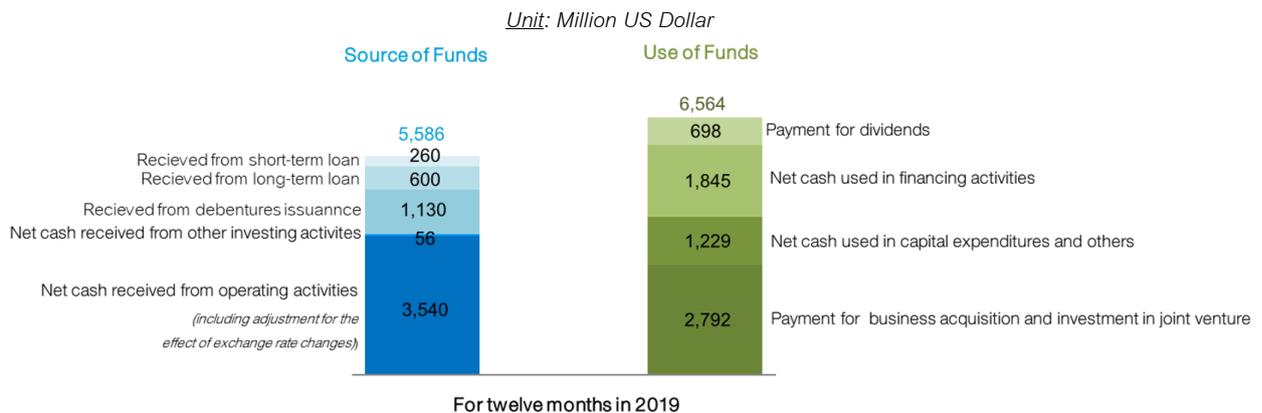
The Company's Total Liabilities of 10,361 MMUSD comprised 3,442 MMUSD worth of interest-bearing debt, carried at a weighted average cost of 4.41% per annum, and having a weighted average maturity of 13.84 years, of which 100% were denominated in USD, and 18% were floating-rate debt.

During 2019, PTTEP Group redeemed, issued, offered and sold debentures per the following details:

- In May and June of 2019, the Company redeemed in full, on the maturity dates, its 5,000 MMTHB and 8,200 MMTHB senior unsecured debentures, respectively.

- In June of 2019, the Company and its wholly-owned subsidiary, PTTEP Treasury Centre Company Limited (PTTEP TC), redeemed in full, 500 MMUSD in principal amount of their subordinated perpetual capital debentures per the companies' rights under the terms, conditions in the bond indenture.
- In June of 2019, PTTEP TC issued senior unsecured guaranteed debentures to institutional and high net-worth investors for a total amount of 15,000 MMTHB. The debentures have a tenor of 3-years, bear a fixed interest rate of 2.26% per annum and are fully guaranteed by the Company.
- In October of 2019, PTTEP TC drew-down the entire amount of its 600 MMUSD club loan facility with commercial banks. The loan bears a floating-interest rate of 6-month LIBOR plus a margin of 0.87% per annum, and is full guaranteed by the Company.
- In December of 2019, PTTEP TC carried out a liability management exercise, repurchasing 469 MMUSD in principal amount of its subordinated perpetual capital debentures, and leaving 31 MMUSD outstanding. Concurrently, PTTEP TC issued 650 MMUSD in principal amount of 40-year senior unsecured guaranteed debentures to foreign institutional investors. The debentures have a fixed coupon of 3.903% per annum, and are fully guaranteed by the Company. PTTEP TC subsequently exercised its rights to redeem all of the remaining subordinated perpetual capital debentures in January 2020 at a redemption price in accordance with the terms, conditions and methods prescribed in the bond indenture.

14.3.4 Cash Flows



As at December 31, 2019, the Group had cash and cash equivalents, including short-term investments in the form of bank fixed deposit with a maturity of more than three months, but within twelve months of 3,023 MMUSD, a decrease of 978 MMUSD from cash and cash equivalents as at December 31, 2018 of 4,001 MMUSD.

Sources of funds in the amount of 5,586 MMUSD primarily came from **Net cash received from operating activities** as a result of the positive net cash flows from sales revenues, offset with cash payments for expenditures and income taxes expenses and **Net cash received from financing activities** derived from the issuance of the senior guaranteed debentures and long-term borrowing.

Uses of funds in the amount of 6,564 MMUSD primarily came from **Net cash used in business acquisition and investment in joint venture** including additional investments in exploration and production assets, primarily for investing in the S1 Project and the Zawtika Project. **The Net cash used in financing activities** were mainly from the redemption of the subordinated capital debentures and the repayment of the unsecured and unsubordinated debentures, as well as the payment of dividend for the second half of 2018 and for the first half of 2019.

14.3.5 Key Financial Ratios

	2018	2017	Q3 2018	Q4 2018	Q4 2017
Profitability Ratios (%)					
EBITDA to revenue from sales	70.65	72.68	69.15	66.74	71.08
Return on equity	13.16	9.53	12.26	13.16	9.53
Net profit margin	24.47	20.51	23.64	24.47	20.51
Leverage Ratios (Times)					
Debt to equity	0.29	0.16	0.18	0.29	0.16
Debt to EBITDA	0.62	0.63	0.49	0.62	0.63

Remark:

EBITDA to revenue from sales	=	Profit before deduction of interest, tax, and depreciation to revenue from sales including revenue from pipeline transportation
Return on equity	=	Net profit to weighted average shareholders' equity for the past 12 months
Net profit margin	=	Net profits to total revenue for the past 12 months
Debt to equity	=	Interest Bearing Debt to total shareholders' equity
Debt to EBITDA	=	Average Interest Bearing Debt to profit for the past 12 months before deduction of interest, tax, and depreciation

14.4 Operational Highlights

At the end of 2019, PTTEP has over 40 projects with domestic and international operations in 15 countries, with total proved reserves of 1,140 million barrels of oil equivalent (MMBOE) and probable reserves of 507 MMBOE. The following are key project highlights.

14.4.1 Projects in Southeast Asia

PTTEP's primary operational base is in Southeast Asia, with projects located in Thailand, the Republic of the Union of Myanmar (Myanmar), Malaysia, the Socialist Republic of Vietnam (Vietnam), and the Republic of Indonesia (Indonesia). In 2019, the average sales volume from projects in Thailand is approximately 274,000 BOED, accounting for 78% of total sales volume. Average sales volume from other countries in this region increased to approximately 71,000 BOED, which accounted for 20% of total sales volume, due mainly to the acquisition of Murphy's business in Malaysia in mid-2019.

Projects in Thailand

The majority of PTTEP's projects in Thailand, both located in the Gulf of Thailand and onshore, are in the *production phase*. Key activities of the main producing projects are as follows. The **Bongkot Project**, **Contract 4 Project** and **Arthit Project** maintained production volumes as planned. The S1 Project continued to drilled additional production wells with the plan to maintain production levels at around 30,000 BPD for the next 3 years. In 2019, the project has average sales volume of approximately 31,000 BPD. **G1/61 Project (Erawan field)** and **G2/61 Project (Bongkot field)** have commenced in preparation phase which includes planning for exploration drilling, initiating construction of production platform and gas pipelines, and other studies to ensure gas production in accordance with the minimum volume stated in the production sharing contract (PSC) of 700-800 MMSCFD starting in 2022-2023 onwards. PTTEP has closely coordinated with the existing concessionaire and the Department of Mineral Fuels to ensure a smooth operational transition.

Projects in Myanmar

The key producing project in Myanmar is the **Zawtika** Project located in the Gulf of Moattama. The project has completed the drilling of the first exploration well in the western area and is in the process of drilling its second exploration well to ensure production continuity. The project received approval for the Field Development Plan of Phase 1D from the Government of Myanmar. In 2019, the project has an average natural gas sales volume of 297 MMSCFD (approximately 48,000 BOED). Projects in *exploration phase* are highlighted and detailed as follows. **The Myanmar M3** Project has submitted a revised Field Development Plan to the Government of Myanmar in Q4/2019 to align with the Gas to Power plan. **The Myanmar MD-7** Project is in the process of preparing for an exploration well to be drilled in Q1/2020. **The Myanmar M11** Project completed the drilling of an exploration well in Q2/2019 with no commercial reserves found and thereby submitted a request to relinquish the block in late Q3/2019 for Myanmar Government's approval. For **the Myanmar MOGE 3 Project**, four wells were drilled in 2019 and evaluated to have no commercial reserves and thus were written off.

Projects in Malaysia

The *producing projects* in Malaysia include **the Block K Project**, consisting of Kikeh, Siakap North-Petai (SNP) and Gumusut-Kakap (GK) fields which are producing oil fields located in the deep water of offshore Sabah. In 2019, the Kikeh Subsea Gas Lift – Phase 1 Project, which is an Improved Oil Recovery (IOR) project for the Kikeh subsea production system to optimize the reserves recovery level, was successfully completed. The project has average production volume in 2019 for crude oil of approximately 27,000 BPD¹. **The Sarawak SK309 and Sarawak SK311 Project** are oil and gas producing fields located in the shallow water of offshore Sarawak. Both projects have started gas production from the 2 infill gas development wells drilled in the first half of 2019. The projects have a total average production volume in 2019 for crude oil and condensate of approximately 26,000 BPD¹ and natural gas around 270 MMSCFD¹ (approximately 46,800 BOED).

Development Projects in Malaysia are as follows. **Block H Project**, located in the deep water of offshore Sabah with capacity of 270MMSCFD, is under development with the first gas expected in Q3/2020. The subsea infrastructure is under construction and scheduled to be completed by Q2/2020. The Petronas Floating LNG host facility that will receive gas from the Block H Project is currently being constructed and remains on schedule for February 2020 sail-away. *Exploration Projects* in Malaysia are highlighted as follows. **The Sarawak SK410B Project**, received an approval to extend its exploration period to three years, until Q1/2023. The project is currently preparing for additional drilling of an appraisal well to evaluate further upside potential in Q2/2020 along with studying for options on filed development plan. **The Sarawak SK314A** also received an approval to extend its exploration period to three years, until 2022. **The Sarawak SK417 Project, the Sarawak SK438 Project, the Sarawak SK405B, the PM407 Project, and the PM 415 Project** are currently being evaluated for petroleum potential and prepare for exploration drilling in 2020-2021.

Projects in Vietnam

The key *Producing Project* is the **Vietnam 16-1 Project**, located offshore in the southeastern region. The project is currently preparing to drill an appraisal well in Q1/2020 to maintain production plateau. In 2019, the project has an average sales volume for crude oil and natural gas of approximately 16,000 BPD and 7 MMSCFD (approximately 1,700 BOED) respectively. *For Exploration Projects*, the **Vietnam B & 48/95 Project and the Vietnam 52/97 Project**, located offshore, are currently in the negotiation process on commercial terms in order to push forward the Final Investment Decision (FID). The projects are expected to have its first gas by end of 2023 with production capacity gradually ramping up to 490 MMSCFD.

¹ The average production and sales volumes per day are calculated from the completion date of acquisition transaction.

14.4.2 Projects in the Middle East

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

Projects under *production phase* in this region include the **PDO (Block 6) Project** which is the largest producing oil asset in Oman, covering an area of approximately one-third of the country. The project has an average sales volume in 2019 for crude oil of approximately 618,000 BPD². The **Mukhaizna (Block 53) Project** is a large producing onshore oil field located in southern Oman. In 2019, the project has an average sales volume of approximately 109,000 BPD². Both projects are obtained from the acquisition of Partex Holding B.V. (Partex) which was completed on 4 November 2019.

Middle East projects under exploration phase are located offshore in the north-west of Abu Dhabi, UAE. The **Abu Dhabi Offshore 1 Project** is currently being evaluated for petroleum potential for future exploration. The **Abu Dhabi Offshore 2 Project**, is currently being evaluated for petroleum potential to prepare for drilling of one exploration well in 2020.

14.4.3 Project in Americas

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

The **Mariana Oil Sands Project**, located in Alberta, Canada, is currently under evaluation for an appropriate development plan.

Projects in Brazil include the **Barreirinhas AP1 Project** located in the Barreirinhas Basin, offshore of the northeastern region of Brazil, and the **Brazil BM-ES-23 Project** located offshore in the Espirito Santo basin, east of Brazil. Both projects are currently being evaluated for petroleum potential.

Projects in Mexico include the **Mexico block 12 (2.4) Project** located in the Mexican Ridges, western Gulf of Mexico and the **Mexico block 29 (2.4) Project**, located in the Campeche, southern Gulf of Mexico. Both projects received an exploration plan approval from the National Hydrocarbons Commission in Mexico and are currently being evaluated for petroleum potential for further commencement according to the approved exploration plan. Mexico block 29 (2.4) Project is in process of preparation for 2 exploration wells to be drilled in 2020.

14.4.4 Projects in Australasia

PTTEP projects in this region include only the PTTEP Australasia Project, which is located in the Commonwealth of Australia (Australia) and consists of 8 permits.

The divestment of the **Montara Field** was completed on 28 September 2018. The operatorship transfer was completed and approved by the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA).

The **Cash Maple Field** is in the *exploration phase*. The field is currently under evaluation for the appropriate development plan. The **AC/P54 in Orchid Field** completed drilling of an exploration well in 2019 with successful results. The well encountered gas and condensate with net pay thickness of around 34 meters. The project plans to include its development along with the Cash Maple Field.

² The average production and sales volumes per day are calculated from the completion date of acquisition transaction.

14.4.5 Projects in Africa

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

The **Algeria 433a and 416b Project**, both of which are in *the production phase*, are located onshore in the eastern part of Algeria. In 2019, the projects have an average production volume of approximately 18,000 BPD.

The **Algeria Hassi Bir Rekaiz Project**, which is in *the development phase*, is located onshore in the eastern part of Algeria. The project has started development on Phase 1 following the conclusion with partners and an approved development plan by the government. Development activities of the project have commenced since March 2019 with expected first oil production for the initial phase of around 10,000-13,000 barrels per day (BPD) in 2021. In the second phase, production capacity is planned to ramp up to around 50,000-60,000 BPD in 2025.

The **Mozambique Area 1 Project**, which is in the *development phase*, is a large LNG project located in offshore Mozambique. Key project highlights in 2019 is the FID announcement to develop the Golfinho-Atum field with the onshore LNG facility of the initial two liquefaction trains, a total nameplate capacity of 12.88 MTPA. The project has successfully secured the long-term LNG sales of 11.1 MTPA with key LNG buyers in both Asia and Europe. The project issued the Notice to Proceed (NTP) for both EPCI Offshore Installation and EPC Onshore Construction Contract. Currently, the contractor has entered the area and has started construction. The project is in the process of procuring LNG container ship. Presently, the project financing process is ongoing, with the plan for first cargo by 2024.

14.5 Company Strategy

14.5.1 Portfolio Management

PTTEP operated through a very successful 2019 on the “Expand and Execute” strategies reflected in areas of business acquisition, namely the acquisition of both Murphy’s business in Malaysia and Partex Holding B.V. (Partex) whose main investment is in the Middle East, and exploration activities namely the gas discovery of Lang Lebah field in the Sarawak SK410B Project. For 2020, PTTEP plans to allocate greater focus on the implementation of the “Execute” strategy, with the following key guiding principles.

Expand: Strategy to focus growth in strategic investment areas and diversify into energy related businesses for long-term sustainability.

- **Coming-Home Strategy:** PTTEP remains committed to expanding businesses in key strategic areas of Thailand and Southeast Asia and continues to pursue the Gas Value Chain business in Myanmar in the form of Gas-to-Power.
- **Strategic Alliance Strategy:** PTTEP continues to search for investment opportunities in the Middle East through forming strategic alliances.
- **New Business Investment Strategy for Sustainability:** PTTEP continues focus on energy-related technological innovation as well as R&D capabilities that complement existing and future businesses.

Execute: Strategy to increase sales volume of legacy assets and maintain competitive advantage.

- **Accelerating activities in exploration projects located in Myanmar and Malaysia:** PTTEP plans for an appraisal campaign for Sarawak SK410B Project and aims to accelerate field development in order to maximize asset value and further increase petroleum reserves.
- **Creating more value from existing assets:** PTTEP continues to apply advanced technology to our operations in the S1 Project, such as pilot testing Enhanced Oil Recovery (EOR) technology, expanding hydraulic fracturing campaigns and improving facilities and liquid handling capacities. In addition, the Company is also planning to utilize the new PTTEP Seismic Processing Center (PSPC) to improve seismic imaging.
- **Maintaining cost competitiveness:** PTTEP has applied digital technologies such as Artificial Intelligence (AI) and Machine Learning (ML) to reduce costs and increase production efficiency.
- **Executing the transitions of Bongkot, Erawan and newly acquired assets:** PTTEP is actively engaging all stakeholders to ensure smooth operational transitions during handovers.
- **Driving the development of key international projects:** PTTEP focuses on monitoring and supporting the development of key projects including the Mozambique Area 1 project and Algeria Hassi Bir Rekaiz project.

14.5.2 Capital Management

PTTEP places great importance on effective financial management by focusing on building financial discipline and maintaining a robust capital structure. As of end of 2019, the Company maintained a strong liquidity position with cash on hand of approximately USD 3 billion. The debt-to-equity ratio is 0.29x which is in line with the Company's financial policy of 0.50x, indicating adequate liquidity for planned production levels, expenses to accelerate the development of projects and exploration activities in accordance with investment plans, and new business opportunities.

In addition, the Company has implemented liability management activities with respect to its USD denominated bonds to optimize efficiency in accordance with the current investment landscape. Details are as follows.

(1) On December 6, 2019, the company repurchased approximately 469 million of USD denominated subordinated perpetual capital securities, which were previously issued and offered to offshore investors in the aggregate principal amount of USD 500 million with a fixed interest rate of 4.6 percent per annum. After completion of the repurchase of the Subordinated Notes, the Company has exercised the right to redeem all of the remaining notes in accordance with the conditions and methods prescribed for the Subordinated Notes on 10 January 2020.

(2) The Company issued USD denominated senior notes to offshore investors in the aggregate principal amount of USD 650 million on 6 December 2019, with the fixed interest of 3.903% per annum maturing on 6 December 2059.

14.6 Sustainable Development

PTTEP aligns its Sustainable Development policy with global practice and UN standards. In 2019, PTTEP was selected, for the sixth consecutive year, as a member of Dow Jones Sustainability Indices (DJSI) in the Oil and Gas Upstream & Integrated Industry sector and has been named the Industry Leader in this category for the second time. PTTEP was elected as a constituent of the FTSE4Good Index Series for the fourth consecutive year and received the SET Awards 2019 in Best Sustainability Awards from the Stock Exchange of Thailand (SET). Additionally, PTTEP received the first-place award as the 2019 Role Model Organization on Human Rights in the state enterprise category from the Department of Rights and Liberties Protection, Ministry of Justice. Finally, PTTEP received the NACC Integrity Awards from The National Anti-Corruption Commission (NACC).

The above success reflects PTTEP's commitment to operating under the concept of FROM "WE" to "WORLD" by conducting business sustainably while delivering value to all stakeholders and expanding the benefits of sustainability to the community, society and environment both domestically and internationally. In 2019, PTTEP operated through 3 major components of the sustainable development framework which includes High Performance Organization – HPO; Governance, Risk Management and Compliance – GRC; and Stakeholders Value Creation – SVC.

14.6.1 High Performance Organization

In addition to implementing the "Expand and Execute" strategies with targeted production growth at 5 percent per year on average and reserves life (R/P ratio) of at least 7 years to achieve sustainable growth, PTTEP also supports Research& Development (R&D) and encourages technological application and innovation to increase efficiency of exploration and production activities. In 2019, key projects which are in progress are as follows:

- **Technology for petroleum exploration and production enhancement**

- Electromagnetic for subsurface fluid movement monitoring: pilot testing is now in progress in Sirikit oil field.
- Adsorbent development for CO₂ removal in natural gas: the prototype design is now in progress.
- Advanced filter development for condensate treatment: the prototype development of the advanced filter and the construction of the testing facility is now in progress.

- **Technology for green practices**

- In-line pipe surface sampling tool for subsea pipeline decommissioning: the sampling tool development for pilot testing is now in progress.
- CO₂ conversion to high valued product to reduce GHG emission: the prototype design is now in progress.
- Carbon nanotube produced from flare gas to reduce GHG emission: the development of carbon nanotube producing unit for pilot testing is in progress.

- **PTTEP Technology and Innovation Center (PTIC):** PTTEP has commenced the construction project of the PTTEP Technology and Innovation Center (PTIC) in the Eastern Economic Corridor of Innovation (EECI) area. The PTIC design phase and the site preparation for construction are now in progress.

Moreover, PTTEP has an environmental management system which is a subset of PTTEP's Safety, Security, Health and Environment Management System (SSHE MS) with a focus on loss prevention. In the last quarter of 2019 PTTEP had a Lost Time Injury Frequency (LTIF) score of 0.07 and a Total Recordable Incident Rate (TRIR) score of 0.55. The Company's performance on both safety indicators is in line with the average of the members of the International Association of Oil and Gas Producers (IOGP).

14.6.2 Governance, Risk Management and Compliance (GRC)

PTTEP is committed to conducting business with accuracy, transparency, fairness and strict compliance with laws and regulations, as well as adhering to the principles of good governance and appropriate risk management. In 2019, significant operating results are as follows:

- Adjust the organization's plans to be in line with the GRC Maturity Level assessment results and communicate to employees for better understanding in this area, as well as integrate GRC reports to cover increasingly important issues.
- Improve GRC operations related to Mergers and Acquisitions (M&A) and the establishing of new businesses to be in line with PTTEP's business growth with a focus on appropriate corporate governance according to company policy, including strict compliance with laws of the countries where the company has invested in, which has reflected a clearer GRC management practice.

14.6.3 Long-Term Stakeholders Value Creation

In 2019, PTTEP's social development strategy is based on Stakeholder Value Creation, with a continued focus on fundamental needs. The Company expanded its success to society in multiple areas and repositioned to operate under the Social Enterprise model to continuously benefit the community e.g. increase crab hatchery learning centers and expand the Marine Resources Conservation Network in Songkhla. In addition, the Company has provided a patient support staff training program. The first trainee class has started working at hospitals and has paid back to the fund.

Moreover, PTTEP aims to become a Low Carbon Footprint organization, and has aimed to reduce its greenhouse gas (GHG) emissions by a minimum of 25% by the year 2030 with 2012 as the base year. The Company plans to achieve the target through projects that recycle excess and flare gases and reduce methane leakages from production processes.

14.7 Future Business Outlook

(1) Energy Outlook

Global energy consumption continues to rely heavily on energy from fossil fuel (including crude oil, natural gas and coal) which contributes about 81% of global energy consumption in 2019. It is forecasted that, in the next 30 years, fossil fuel will remain the primary energy source making up 72% of global energy consumption while renewable and nuclear energy consumption will increase to 21% and 5% respectively (Source: IHS Markit). Demand for natural gas and LNG is likely to increase from global economic growth and power generation sector as governments in various countries, especially China, have implemented a policy to encourage cleaner energy consumption from natural gas, instead of coal. Crude oil consumption is expected to grow continuously but at a much lower rate of 0.3% average annual growth, mainly from the expansion of the petrochemical industry and heavy-duty transport sectors. However, crude oil consumption in passenger cars is expected to decrease significantly due to higher fuel efficiency in passenger cars and increasing usage of electric vehicles. Additionally, the demand for renewable energy, especially solar and wind energy, is likely to increase in many countries due to increasing supports from governments to tackle pollution and global warming problems, as well as advances in power generation technology and economies of scale.

For Thailand, the Government has finalized the new Power Development Plan (PDP 2018) and expects that by 2037, the end of the plan's coverage, natural gas will become the major power source for electricity, comprising 53% of all energy consumption attributable to its cost-efficiency. According to the plan, renewable energy is expected to make up 20%.

PTTEP continues to highly prioritize natural gas which aligns well with the world's transition towards cleaner energy. The Company remains committed to developing large natural gas projects in the Company's portfolio such as the SK410B Project and Mozambique Area 1 Project. Moreover, PTTEP continues to seek investment opportunities in the gas value chain business in Myanmar in the form of Gas-to-Power. In addition, PTTEP continues to place importance in technological applications, especially in Robotics and Artificial Intelligence (AI) which can be used to enhance competitiveness and provide business opportunities that may exist in the future global energy industry landscape.

(2) Oil Price Outlook

For 2020, average Dubai crude prices is expected to be in the 60-70 USD per barrel range, reflecting decreased concerns on the oversupply situation as OPEC+ has agreed to cut production from the agreed level by an additional 0.5 million barrels per day in 2020 and the US imposing more sanctions on Iran.

On the demand perspective, although the aftermath of the IMO2020 regulations led to an increase in crude oil demand, the limiting of Sulphur content in bunker fuel used in marine transportation could affect the demand for high-Sulphur crude such as Dubai. Trading and manufacturing numbers are expected to grow slightly in 2020 due to concerns on global economic slowdown. Although US-China trade war has shown signs of improvement from the signing of phase 1 trade deal, new trade tensions between US and EU (i.e. tariff on EU projects) have emerged and should be monitored together with a potential no-deal Brexit. Above factors could negatively impact crude demand growth in 2020.

In summary, the key factors to monitor in the near-term are the US trade war tensions with China and Europe, Brexit, geopolitical tensions in the Middle East that could lead to the hike in crude prices in the short-term. If the violence in the Middle East escalates into a regional war affecting the production and exports of crude oil, then crude prices could be higher than anticipated.

(3) LNG Market

The oversupply situation of Global LNG market is expected to continue into 2020 with total production capacity from existing and upcoming LNG projects to increase by approximately 8% to 390 million tons, while demand for LNG is anticipated to stabilize at 373 million tons. The crude oil prices in the world market are likely to fluctuate in 2020, which could affect LNG price. The average Asian Spot LNG price is expected to be in the range between 4.5 - 6.9 USD/MMBTU and may be higher if the hostility between the United States and Iran escalates causing concerns over the possibility of lower LNG supply from the Middle East, especially from Qatar, if the Strait of Hormuz is closed. Moreover, additional positive factors supporting LNG prices include higher-than-expected LNG demand in Asian Market especially from China and India, supply disruption from existing LNG projects coupled with the lack of FIDs over 2016-2017 which will result in significantly decreased LNG supply growth during 2022 – 2024. Nonetheless, the market could start to balance in 2024.

(4) Thai Economy and Foreign Exchange Outlook

The Bank of Thailand expects 2020 GDP growth at 2.8%, which is lower than previous estimation and may be further revised downward, mainly due to continuous export growth contraction following the demand slowdown of trading partner economies from intensified trade tension. Public spending and private investments also expanded at slower than expected paces. However, the recovery of the tourism sector is likely to continue due to public stimulus measures.

2020 USDTHB is expected to further strengthen and move within range 29.00 - 31.00. Prolonged economic risks support investors' allocation in safe-haven assets including THB due to its financial stability from current account surplus

and high FX reserves. Looking ahead requires monitoring the effectiveness on Bank of Thailand's policy measures aimed at maintaining THB stability. Other key monitoring events include geopolitical tensions between US and the Middle East, US Federal Reserve monetary policy, US election results and US-China trade war, all of which will impact the direction of fund flows and exchange rate in 2020.

PTTEP has adopted the natural hedge method to manage FX risk by matching USD and USD-linked revenues from petroleum products with major USD expenses. The remaining FX risk exposures from non-USD revenues and expenses are managed by utilizing financial hedging instruments such as forwards and cross currency swaps. In addition, FX impact on income tax is reduced due to the change in PTTEP's tax filing currency. Moreover, interest rate volatility does not materially impact the Company's financial performance as 82% of total interest-bearing debt is fixed rate.

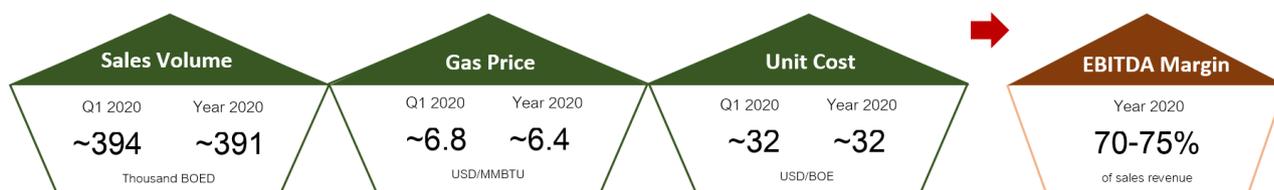
(5) Other Important Factors That Affect the Company's Operations

IMO 2020 Regulations, the International Maritime Organization (IMO) agreed to limit Sulphur content in all marine fuels to 0.5% (from current 3.5%) effective on 1 January 2020 onwards. As a result, demand of High Sulphur Fuel Oil (HSFO) is expected to decrease significantly and HSFO's price had started to drop dramatically in Q4/2019. According to PTTEP's gas sale agreement especially in the Gulf of Thailand, HSFO is one of the factors accounted in the gas pricing formula which will lead to a risk of lower gas price. However, the company expects minor impact this year since PTTEP's gas price formula is partly linked to fuel oil and referred to an average historical price of past 6 to 24 months. In addition, PTTEP has also hedged a portion of sales volume against the volatility of HSFO. From 2022 onwards, PTTEP expects a material decrease of the impacts according to gas selling price of Bongkot and Erawan under the new production sharing contracts linked to Dubai crude price.

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, which will allow tax filing to be done in the company's functional currency other than Thai Baht. This will subsequently reduce the impact of foreign exchange volatility on financial statements. In Q2/2019, PTTEP received approval to change the currency for tax filing under Petroleum Income Tax and had recognized its effect. However, for other companies in PTTEP's Group, tax filings continue to be in Thai Baht; as a result, the impact of foreign exchange volatility on financial statements remain but in a reduced magnitude.

(6) PTTEP's Performance Outlook for 2020

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



- Note:
- The sales volume includes the sales volume from ADNOC Gas Processing (AGP) which was part of the acquisition of Partex completed in November 2019.
 - The assumption is based on average Dubai price in 2020 of 60 USD/BBL and average HSFO-Dubai spread in 2020 of 13 USD/BBL

Sales Volume: PTTEP expects the average sales volume for the Q1/2020 and for the full-year of 2020 to be approximately 394,000 and 391,000 barrels of oil equivalent per day, respectively. This is a result of the acquisition of Murphy's business in Malaysia and the acquisition of Partex which was completed in July and November 2019, respectively.

Sales Price:

- PTTEP's liquid prices will fluctuate according to global crude prices.
- PTTEP's gas price formulas are partially linked to oil prices with reference to average historical prices ranging from the past 6 to 24 months. The average gas price for Q1/2020 and the full-year of 2020 are estimated at approximately 6.8 and 6.4 USD/MMBTU respectively, reflecting the adjustment of selling price in accordance to global crude prices.
- Outstanding volume of oil price hedging at the end of 2019 is approximately 13 million barrels; the Company, however, consistently monitors crude oil price movements and has the flexibility to adjust its hedging plan as appropriate.

Unit Cost: For Q1/2019 and the full-year of 2020, PTTEP expects to be able to maintain unit cost at around 32 USD/BOE, in line with planned investments and activities.

Attachment 1: Information of the Board of Directors, Management, Controlling Persons, and Company Secretary

1. PTTEP's Board of Directors

As of December 31, 2019, PTTEP's Board of Directors consists of 15 directors. Details of 15 current directors and 2 directors retiring from the office during the year 2019 are as below.

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
Mr. Prajya Phinyawat	68	Education	0.00038 (15,000 shares)	None	Other listed companies		
- Chairman - Chairman of the Independent Director		<ul style="list-style-type: none"> ● Ph.D. (Civil Engineering), University of Texas at Austin, U.S.A. ● M.S. (Civil Engineering), Stanford University, U.S.A. ● B.E. (Civil Engineering), Chulalongkorn University 			2011 - 2014	● Director	● PTT Global Chemical Public Company Limited
Begin Date		Training of Thai Institute of Directors Association			Other companies		
March 28, 2012		<ul style="list-style-type: none"> ● Board Matters and Trends (BMT) 4/2017 ● The Power of Culture: From Performance Culture to Winning Culture Seminar ● Anti-Corruption: Leadership Role of the Board 			2011 - 2016	● Chairman	● PTT Asahi Chemical Company Limited
					Other organizations		
					2015 - Present	● Director of Council	● Vidyasirimedhi Institute of Science and Technology (VISTEC)

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
		<ul style="list-style-type: none"> ● 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 					
		<p>Other Trainings</p> <ul style="list-style-type: none"> ● CERAWeek 2019 in Houston, Texas, U.S.A. ● 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 Academy Leadership Program (Class 7), Capital Market Academy ● Certificate of Energy Literacy for a Sustainable Future Program (Class 1/2012), Thailand Energy Academy 					

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
Mr. Achporn Charuchinda	66	Education	None	None	Other listed companies		
- Independent Director - Chairman of the Remuneration Committee - Chairman of the Audit Committee		<ul style="list-style-type: none"> L.L.B., Faculty of Law, Thammasat University Thai Barrister-at-Law, Institute of Legal Education of the Thai Bar Association 			2012 - 2015	<ul style="list-style-type: none"> Member of the Legal Committee 	<ul style="list-style-type: none"> Thai Airways International Public Company Limited
Begin Date		Training of Thai Institute of Directors Association			Other companies		
January 1, 2013		<ul style="list-style-type: none"> None 			2013 - 2016	<ul style="list-style-type: none"> Director 	<ul style="list-style-type: none"> Thai Smile Airways Company Limited
		Other Trainings			Other organizations		
		<ul style="list-style-type: none"> Law Drafting Certificate, Republic of India The National Defense Course (Class 46), National Defense College 			2017 - Present	<ul style="list-style-type: none"> Board Member in Legal 	<ul style="list-style-type: none"> The National Economic and Social Development Board (NESDB)
					2017 - Present	<ul style="list-style-type: none"> Chairman 	<ul style="list-style-type: none"> National Reform Committee in Justice Process, National Reform Committee
					2017 - Present	<ul style="list-style-type: none"> Member of the Risk Oversight Committee 	<ul style="list-style-type: none"> The Bank of Thailand
					2015 - Present	<ul style="list-style-type: none"> Member 	<ul style="list-style-type: none"> Constitution Drafting Committee
					2014 - Present	<ul style="list-style-type: none"> Board Member 	<ul style="list-style-type: none"> Office of Insurance Commission
					2014 - Present	<ul style="list-style-type: none"> Board Member 	<ul style="list-style-type: none"> Highland Research and Development Institute (Public Organization)
					2003 - Present	<ul style="list-style-type: none"> Member of the Council of State 	<ul style="list-style-type: none"> The Office of the Council of State

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
					2015 - 2017	<ul style="list-style-type: none"> ● Board Member 	<ul style="list-style-type: none"> ● The National Economic and Social Development Board (NESDB)
					2013 - 2017	<ul style="list-style-type: none"> ● Board Member 	<ul style="list-style-type: none"> ● The Bank of Thailand
					Apr. - Oct. 2016	<ul style="list-style-type: none"> ● Director 	<ul style="list-style-type: none"> ● Thailand Tobacco Monopoly, Ministry of Finance
					2013 - 2015	<ul style="list-style-type: none"> ● Chairman of the Securities and Exchange Commission Board 	<ul style="list-style-type: none"> ● The Securities and Exchange Commission
					2012 - 2014	<ul style="list-style-type: none"> ● Member of the Board of Directors 	<ul style="list-style-type: none"> ● The Metropolitan Waterworks Authority
					2011 - 2014	<ul style="list-style-type: none"> ● Member of the Institutions Policy Committee 	<ul style="list-style-type: none"> ● The Bank of Thailand
					2011 - 2014	<ul style="list-style-type: none"> ● Member of the Office of the Teacher Civil Service and Educational Personnel Commission 	<ul style="list-style-type: none"> ● The Office of the Teacher Civil Service and Educational Personnel Commission, The Ministry of Education

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
Admiral Tanarat Ubol	65	Education	None	None	Other listed companies		
- Vice Chairman of the Independent Directors Committee		<ul style="list-style-type: none"> ● Master of Public and Private Management, National Institute of Development Administration (NIDA) ● Bachelor of Science in Electrical Engineering, The National Defense Academy of Japan 			None		
- Chairman of the Corporate Governance Committee					Other companies		
- Member of the Remuneration Committee					2014 - 2015	● Chairman	● Bangkok Dock Company Limited
Begin Date					Apr. - Sep. 2015	● Director	● Thai Aviation Industries Company Limited
September 1, 2014	Other organizations						
		Training of Thai Institute of Directors Association			2015 - Present	● Royal Thai Navy Retired	● Office of the Permanent Secretary for Defence
		<ul style="list-style-type: none"> ● 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 for Corporate Leaders (RCL) 26/2016 ● Boards that Make a Difference (BMD) 1/2016 			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
					2013 - 2014	● Chairman	● Royal Thai Navy Transport Helicopter Procurement Project, Royal Thai Navy

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
		<ul style="list-style-type: none"> ● Ethical Leadership Program (ELP) 1/2015 ● Director Certification Program (DCP) 204/2015 			2013 - 2014	<ul style="list-style-type: none"> ● Chairman 	<ul style="list-style-type: none"> ● HTMS Naresuan Frigate Squadron Improvement Project, Royal Thai Navy
		<p>Other Trainings</p> <ul style="list-style-type: none"> ● 22nd World Petroleum Congress (WPC), Istanbul, Turkey ● Maritime Joint Force Commander Course (Admiral Level), Hawaii, U.S.A. ● Advanced Security for Senior Executive, Hawaii, U.S.A. ● National Institute for Defense Studies (Japan) ● National Institute for Defense College (Class 51) 					

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
Mr. Sethaput Suthiwart-Narueput - Independent Director - Chairman of the Risk Management Committee - Member of the Nominating Committee - Member of the Audit Committee Begin Date September 1, 2014	54	Education	None	None	Other listed companies		
		<ul style="list-style-type: none"> ● Ph.D. Economics, Yale University, U.S.A. 			2016 - Present	● Director	● Osotspa Public Company Limited
		Training of Thai Institute of Directors Association			Other companies		
		<ul style="list-style-type: none"> ● M.Phil. Economics, Yale University, U.S.A. 			2011 - Jan. 2018	● Director and Managing Partner	● The Advisor Company Limited
		<ul style="list-style-type: none"> ● B.A. (Highest Honors) Economics, Swarthmore College, U.S.A. 			Other organizations		
		2017 - Present			● Member of the Board of Directors	● The Bank of Thailand	
		2015 - Present			● Director	● Puey Ungphakorn Institute for Economic Research, Bank of Thailand	
		2014 - Present			● Member of the Monetary Policy Committee	● The Bank of Thailand	
		2012 - 2017			● Executive Chairman	● Thailand Future Foundation	
		2000 - 2017			● Visiting Professor of Economics	● Sasin Graduate Institute of Business Administration	
2015 - 2016	● Advisor on Academic Affairs	● Sasin Graduate Institute of Business Administration					

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
Major General Nimit Suwannarat - Independent Director - Member of the Nominating Committee - Member of the Risk Management Committee Begin Date September 1, 2014	48	Education	None	None	Other listed companies		
		<ul style="list-style-type: none"> ● Master of Arts in International Relations, Chulalongkorn University 			None		
		<ul style="list-style-type: none"> ● Master of Science in Electrical Engineering (Communications and Signal Processing), University of Minnesota, Minnesota, U.S.A. 			Other companies		
		<ul style="list-style-type: none"> ● Bachelor of Science in Electrical Engineering, Virginia Military Institute, Virginia, U.S.A. 			None		
		Training of Thai Institute of Directors Association			Other organizations		
		<ul style="list-style-type: none"> ● Director Certification Program (DCP) 216/2016 			Oct. 2019 - Present	<ul style="list-style-type: none"> ● Attached to Prime Minister 	<ul style="list-style-type: none"> ● The Prime Minister's Office
		Other Trainings			Oct. 2018 - Present	<ul style="list-style-type: none"> ● Deputy Chief of Office 	<ul style="list-style-type: none"> ● Office of Military Affairs ● Coordination to the Ministry of Foreign Affairs, Office of Policy Planning Ministry of Defence, Ministry of Defence
<ul style="list-style-type: none"> ● Public Key Infrastructure (Certification Authority, Digital Signature) Course, Ottawa, Canada ● Electronic Commerce Course, Orlando, Florida, U.S.A. 	Apr. - Sep. 2018	<ul style="list-style-type: none"> ● Staff Officer to the Minister of Defence 	<ul style="list-style-type: none"> ● Ministry of Defence 				
	2017 - Mar. 2018	<ul style="list-style-type: none"> ● Commanding Officer 	<ul style="list-style-type: none"> ● 1st Development Regiment, Royal Thai Army 				
	2016 – 2017	<ul style="list-style-type: none"> ● Senior Operation Officer, 	<ul style="list-style-type: none"> ● Defence Industry and Energy Center, Office of the Permanent Secretary for Defence 				
	2015 – 2016	<ul style="list-style-type: none"> ● Commanding Officer 	<ul style="list-style-type: none"> ● 1st Field Artillery Regiment King's Guard, Royal Thai Army 				

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
		<ul style="list-style-type: none"> ● Computer Emergency Response Team, Carnegie Melon, Pittsburg, Pennsylvania, U.S.A. ● National Crisis Management Course, APCSS, Honolulu, Hawaii, U.S.A. ● 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 			2010 - 2015	<ul style="list-style-type: none"> ● Executive Officer 	<ul style="list-style-type: none"> ● 1st Field Artillery Regiment, King's Guard, Royal Thai Army

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
Mr. Twarath Sutabutr - Director - Member of the Risk Management Committee Begin Date October 1, 2015	50	Education <ul style="list-style-type: none"> ● Ph.D. Civil & Environmental Engineering, Massachusetts Institute of Technology (MIT), U.S.A. ● M.S. Soil Mechanics, Asian Institute of Technology (AIT) ● B.E. Civil Engineering, Chulalongkorn University Training of Thai Institute of Directors Association <ul style="list-style-type: none"> ● Anti-Corruption: Leadership Role of the Board ● Director Certification Program (DCP) 115/2009 ● Financial Statements for Directors Program (FSD) 4/2009 Other Trainings <ul style="list-style-type: none"> ● Executive Program in International Management, Stanford-NUS (National University of Singapore) Aug 2019 	None	None	Other listed companies		
					2014 - 2015	● Director	● Thai Oil Public Company Limited
					Apr. 2015 - Jul. 2015	● Director	● PTT Public Company Limited
					Other companies		
					Apr. 2019 - Present	● Director	● Dhanarak Asset Development Co., Ltd.. (State of Enterprise Ministry of Finance)
					Other organizations		
					Oct. 2018 - Present	● Inspector General	● Office of the Permanent Secretary, Ministry of Energy
					2019 - Present	● Vice President	● Chulalongkorn University Alumni Association in the Royal Patronage
					Nov. 2019 - Present	● Executive Committee	● Asian Institute of Technology (AIT)
					2017 - Present	● Director, The Civil Service Sub-Commission	● The Office of the Civil Service Commission (OCSC)
					2017 - Present	● Sub-committee Member, Public Sector Development Commission Sub-committee on Public Sector Drive 4.0	● Office of the Public Sector Development Commission (OPDC)

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
		<ul style="list-style-type: none"> ● CERAWeek 2019 in Houston, Texas, U.S.A. ● 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) ● Energy Literacy for a Sustainable Future (Class 10), Thailand Energy Academy ● Capital Market Academy Leadership Program (Class 24), Capital Market Academy ● International Leadership Program (ILP) by Government of the United Kingdom 			<ul style="list-style-type: none"> 2017 - Dec. 2019 2017 - Nov. 2019 2015 - Oct. 2018 2014 - Feb. 2018 2014 - 2015 2014 - 2015 2013 - 2014 2009 - 2014 	<ul style="list-style-type: none"> ● Association President ● Association President, Thai Government Scholarship Students Association ● Director-General ● Spokesperson ● Deputy Director-General ● Chairman ● Advisor to the Board of Directors: Energy ● Deputy Director General 	<ul style="list-style-type: none"> ● Asian Institute of Technology (AIT) ● The Office of the Civil Service Commission (OCSC) ● Energy Policy and Planning Office, The Ministry of Energy ● Ministry of Energy ● Ministry of Energy ● Department of Alternative Energy Development and Efficiency Co-Operative ● The Engineering Institute of Thailand under H.M. The King's Patronage ● Department of Alternative Energy Development and Efficiency

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
		<ul style="list-style-type: none"> ● e-Government Executive Program (e-GEP) Class 5, Electronics Government Agency (Public Organization) ● Advance Management Program (AMP) INSEAD, French Republic (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 fo Senior Civil Servants (Class 61), Office of the Civil Service Commission 					

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
		<ul style="list-style-type: none"> ● 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, U.S.A. 					

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
Mr. Pitipan Teparimargorn	63	Education <ul style="list-style-type: none"> ● M.A. Political Science (Public Administration), Thammasat University ● B.E. Electrical Engineering (Second Class Honor), King Mongkut's Institute of Technology Ladkrabang 	None	None	Other listed companies		
- Director - Member of the Risk Management Committee - Member of the Corporate Governance Committee - Member of the Nominating Committee		Training of Thai Institute of Directors Association <ul style="list-style-type: none"> ● Anti-Corruption: Leadership Role of the Board ● Director Certification Program (DCP 138/2010) ● Anti-Corruption for Executive Program (ACEP 4/2012) 			Oct. 2018 - Nov. 2019 Feb. 2018 Apr. - May. 2019 May. - Jul. 2019 May. 2018 - Apr. 2019	<ul style="list-style-type: none"> ● Chairman of the Nomination and Remuneration Committee ● Member of the Nomination and Remuneration Committee ● Corporate Plan Steering and Monitoring Committee ● Chairman of the Labour Relations Committee ● Member of the Risk Management Committee 	<ul style="list-style-type: none"> ● Thai Airways International Public Company Limited
Begin Date		Other Trainings <ul style="list-style-type: none"> ● Strategic Human Resource Management, Harvard University, U.S.A. 					
November 1, 2015							

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
		<ul style="list-style-type: none"> ● NIDA – Wharton Executive Leadership Program, The Wharton School, University of Pennsylvania, U.S.A. ● 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, U.S.A. ● Capital Market Academy Leadership Program (Class 19), Capital Market Academy 			2018 - Nov. 2019 Aug. 2018 - Apr. 2019 Mar. - Aug. 2018 2015 - 2016	<ul style="list-style-type: none"> ● Member of the Human Resources Committee ● Steering Subcommittee of TG MRO Campus Project and TG Business Development at U-Tapao Airport Project ● Member of the Recruitment of THAI's President Committee ● Chief Operation Officer, Upstream Petroleum and Gas Business Group 	<ul style="list-style-type: none"> ● Thai Airways International Public Company Limited ● Thai Airways International Public Company Limited ● Thai Airways International Public Company Limited ● PTT Public Company Limited

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
					2010 - 2015	<ul style="list-style-type: none"> Senior Executive Vice President, Human Resources & Organization Excellence 	<ul style="list-style-type: none"> PTT Public Company Limited
					Other companies		
					2014 - 2016	<ul style="list-style-type: none"> Director and Chairman of the Remuneration Committee 	<ul style="list-style-type: none"> Sakari Resources Limited
					Apr - Oct 2016	<ul style="list-style-type: none"> Chairman 	<ul style="list-style-type: none"> PTT Energy Resources Co., Ltd.
					2012 - 2015	<ul style="list-style-type: none"> Chairman 	<ul style="list-style-type: none"> PTT Polymer Logistics Co., Ltd.
					2010 - 2015	<ul style="list-style-type: none"> Chairman 	<ul style="list-style-type: none"> PTT ICT Solutions Co., Ltd.
					2012 - 2014	<ul style="list-style-type: none"> Chairman 	<ul style="list-style-type: none"> PTT Polymer Marketing Company Limited
					Other organizations		
					2019 - Present	<ul style="list-style-type: none"> Senior Advisor of the Governing Board 	<ul style="list-style-type: none"> Kamnoetvidya Science Academy (KVIS)

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
					Feb. 2018 - Present	<ul style="list-style-type: none"> Chairman of the Executive Committee 	<ul style="list-style-type: none"> Vidyasirimedhi Institute (VISTEC)
					2015 - Present	<ul style="list-style-type: none"> Council Member, Executive Board Member, and Chairman of the Personnel Management Committee 	<ul style="list-style-type: none"> Vidyasirimedhi Institute (VISTEC)
					2017 - 2019	<ul style="list-style-type: none"> Vice Chairman of the Governing Board 	<ul style="list-style-type: none"> Kamnoetvidya Science Academy (KVIS)
					2014 - 2019	<ul style="list-style-type: none"> Director, The Civil Service Sub-Commission on Development of Human Resource Management (HRM) 	<ul style="list-style-type: none"> The Office of the Civil Service Commission (OCSC)

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
Mr. Bundhit Eua-arporn - Independent Director - Chairman of the Nominating Committee Begin Date August 1, 2017	54	Education <ul style="list-style-type: none"> ● Ph.D., Imperial College of Science Technology and Medicine, University of London, United Kingdom ● M.Eng., Chulalongkorn University ● B.Eng., Chulalongkorn University 	Spouse 0.00012 (4,587 shares)	None	Other listed companies		
		2016 - Present			<ul style="list-style-type: none"> ● Executive Board Member 	<ul style="list-style-type: none"> ● Banpu Power Public Company Limited 	
		Other companies					
		None					
		Other organizations					
2016 - Present	<ul style="list-style-type: none"> ● President 	<ul style="list-style-type: none"> ● Chulalongkorn University 					
Aug. - Sep. 2017	<ul style="list-style-type: none"> ● Board Member 	<ul style="list-style-type: none"> ● National Reform Committee in Energy, National Reform Committee 					
2015 - 2016	<ul style="list-style-type: none"> ● Honorary Board Member 	<ul style="list-style-type: none"> ● Thailand Institute of Scientific and Technological Research 					
2013 - 2016	<ul style="list-style-type: none"> ● Dean 	<ul style="list-style-type: none"> ● Faculty of Engineering, Chulalongkorn University 					
Other Trainings							
<ul style="list-style-type: none"> ● Energy Executive Program (Class 6), Ministry of Energy ● Power of the Kingdom (Bhumipalung Phandin) (Class 3), Chulalongkorn University Executive Program ● Temasek Foundation-NUS Programme for Leadership in University Management 							

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
Ms. Panchun Jarikasem - Director - Member of the Risk Management Committee Begin Date February 1, 2018	65	Education <ul style="list-style-type: none"> ● Master of Science (Business Administration), Thammasat University ● Bachelor of Arts, Chulalongkorn University 	0.00025 (10,000 shares)	None	Other listed companies		
		Training of Thai Institute of Directors Association <ul style="list-style-type: none"> ● 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 (AAP) 7/2012 ● Director Certification Program (DCP) 113/2009 ● Director Accreditation Program (DAP) 75/2008 			2016 - Present	● Chairman of the Audit Committee	● Osotspa Public Company Limited
					2016 - Present	● Independent Director	● Osotspa Public Company Limited
					2011 - 2015	● Executive Vice President, Finance and Accounting Group	● PTT Exploration and Production 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 2018 - Present	● Sub-committee, Sub-committee on Consideration of Regulations on Issuance and Offering of Debt Securities, Derivatives and Structured Products	● The Securities and Exchange Commission (SEC)

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
		Other Trainings <ul style="list-style-type: none"> ● The Executive Program in Energy Literacy for a Sustainable Future TEA (Class 6), Thailand Energy Academy (TEA) ● Bhumipalung Phandin for Top Executives (Class 3), Chulalongkorn University ● Senior Executive Program No.77 (SEP 77), London Business School (LBS) ● Capital Market Academy Leadership (CMA 4), Capital Market Academy (CMA) 			2017 - Present May. 2018 - Oct. 2019 Apr. 2018 - Oct. 2019 2016 – Dec. 2018	<ul style="list-style-type: none"> ● Advisory Committee for Fund Raising and Listed Company Oversight ● Chairman of the Sub-committee for Finance and Accounting ● Director ● Sub-committee for Finance and Budgeting Improvement 	<ul style="list-style-type: none"> ● The Securities and Exchange Commission (SEC) ● State Railway of Thailand ● State Railway of Thailand ● Office of The Public Sector Development Commission (OPDC)

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
Mr. Chansin Treenuchagron	59	Education	None	None	Other listed companies		
- Director		<ul style="list-style-type: none"> ● Master Degree of Economic, Chulalongkorn University ● Bachelor Degree of Economic, Thammasat University 			Aug. 2018 - Present	<ul style="list-style-type: none"> ● President and Chief Executive Officer 	<ul style="list-style-type: none"> ● PTT Public Company Limited
Begin Date		Training of Thai Institute of Directors Association			Aug. 2018 - Present	<ul style="list-style-type: none"> ● Director and Secretary of the Board of Directors 	<ul style="list-style-type: none"> ● PTT Public Company Limited
September 1, 2018		<ul style="list-style-type: none"> ● Chartered Director Class (CDC) 10/2015 ● Director Accreditation Program (DAP) 93/2011 ● Financial Statements for Directors (FSD) 12/2011 ● Director Certification Program (DCP) 85/2007 			Aug. 2018 - Present	<ul style="list-style-type: none"> ● Chairman 	<ul style="list-style-type: none"> ● IRPC Public Company Limited
		Other Trainings			Jan. - Aug. 2018	<ul style="list-style-type: none"> ● Chief Technology and Engineering Officer 	<ul style="list-style-type: none"> ● PTT Public Company Limited
	<ul style="list-style-type: none"> ● The Executive Program in Energy Literacy for a Sustainable Future (Class 7/2015), Thailand Energy Academy (TEA) 	2017 - 2018	<ul style="list-style-type: none"> ● Director, Member of the Risk Management Committee and Member of the Nomination and Remuneration Committee 	<ul style="list-style-type: none"> ● Global Power Synergy Public Company Limited 			

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
		<ul style="list-style-type: none"> Diploma, The National Defence Course (Class 57/2014), National Defense College 			2015 - 2018	<ul style="list-style-type: none"> Director and Member of the Risk Management Committee 	<ul style="list-style-type: none"> IRPC Public Company Limited
					Oct. - Dec. 2017	<ul style="list-style-type: none"> Chief Operation Officer, Infrastructure and Sustainability Management Business Group 	<ul style="list-style-type: none"> PTT Public Company Limited
					2016 - 2017	<ul style="list-style-type: none"> Senior Executive Vice President, Downstream Business Group Alignment 	<ul style="list-style-type: none"> PTT Public Company Limited
					Oct. - Dec. 2015	<ul style="list-style-type: none"> Senior Executive Vice President, Petrochemicals & Refining Business Unit 	<ul style="list-style-type: none"> PTT Public Company Limited
					Apr. - Oct. 2015	<ul style="list-style-type: none"> Director 	<ul style="list-style-type: none"> Thaioil Public Company Limited

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
					2014 - 2015	<ul style="list-style-type: none"> Senior Executive Vice President, Corporate Strategy 	<ul style="list-style-type: none"> PTT Public Company Limited
					2013 - 2014	<ul style="list-style-type: none"> Executive Vice President, PTT, working on a secondment as Senior Executive Vice President, Corporate Commercial and Marketing 	<ul style="list-style-type: none"> IRPC Public Company Limited
					2012 - 2014	<ul style="list-style-type: none"> Director 	<ul style="list-style-type: none"> UBE Chemical (Asia) Public Company Limited

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
					2011 - 2013	<ul style="list-style-type: none"> Executive Vice President, PTT, working on a secondment as Senior Executive Vice President, Port & Asset Management Business unit 	<ul style="list-style-type: none"> IRPC Public Company Limited
					Other companies		
					2018 - Present	<ul style="list-style-type: none"> Chief Advisor 	<ul style="list-style-type: none"> PTT Saving and Credit Cooperation Limited
					2017 - Aug 2018	<ul style="list-style-type: none"> Chairman 	<ul style="list-style-type: none"> PTT Digital Solutions Company Limited
					Apr. - Dec. 2017	<ul style="list-style-type: none"> Chairman 	<ul style="list-style-type: none"> PTT Asahi Chemical Company Limited
					2015 - 2017	<ul style="list-style-type: none"> Chairman 	<ul style="list-style-type: none"> PTT Polymer Marketing Company Limited
					2015 - 2017	<ul style="list-style-type: none"> Chairman 	<ul style="list-style-type: none"> PTT Polymer Logistics Company Limited

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
					2014 - 2015	<ul style="list-style-type: none"> PTT Green Energy (Thailand) Company Limited 	<ul style="list-style-type: none"> PTT Green Energy (Thailand) Company Limited
					2012 - 2015	<ul style="list-style-type: none"> Director 	<ul style="list-style-type: none"> PTT Polymer Logistics Company Limited
					2012 - 2014	<ul style="list-style-type: none"> Director 	<ul style="list-style-type: none"> PTT Polymer Marketing Company Limited
					2012 - 2014	<ul style="list-style-type: none"> Director 	<ul style="list-style-type: none"> Rayong Acetylene Company Limited
					2011 - 2014	<ul style="list-style-type: none"> Director 	<ul style="list-style-type: none"> Technology IRPC Company Limited
					2011 - 2014	<ul style="list-style-type: none"> Director 	<ul style="list-style-type: none"> IRPC Polyol Company Limited
					2011 - 2014	<ul style="list-style-type: none"> Director 	<ul style="list-style-type: none"> Rak Pa Sak Company Limited
					Other organizations		
					Aug. 2019 - Present	<ul style="list-style-type: none"> President 	<ul style="list-style-type: none"> Thammasat Association under the Royal Patronage
					2018 - Present	<ul style="list-style-type: none"> Member 	<ul style="list-style-type: none"> The PTIT Council of Trustees
					2018 - Present	<ul style="list-style-type: none"> Director and Vice Chairman 	<ul style="list-style-type: none"> Thai Listed Companies Association
					2018 - Present	<ul style="list-style-type: none"> Member of Thailand Foundation Committee 	<ul style="list-style-type: none"> Thailand Foundation

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
					2018 - Present	<ul style="list-style-type: none"> Member of Committee, Social Participation Committee 	<ul style="list-style-type: none"> Princess Maha Chakri Award Foundation
					2018 - Mar. 2019	<ul style="list-style-type: none"> Board member, Faculty of Economics 	<ul style="list-style-type: none"> Thammasat University
					Feb. 2018 - Mar. 2019	<ul style="list-style-type: none"> Board member, College of Innovation 	<ul style="list-style-type: none"> Thammasat University
					2017 - Aug. 2019	<ul style="list-style-type: none"> Member of Committee 	<ul style="list-style-type: none"> Thammasat Association under the Royal Patronage

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
Mr. Patchara Anuntasilpa	48	Education	None	None	Other listed companies		
- Director		<ul style="list-style-type: none"> ● Master Degree in Business Administration (M.B.A.), Shenandoah University, U.S.A. ● Bachelor Degree in Business Administration, Bangkok University 			None		
- Member of the Remuneration Committee					Other companies		
Begin Date					None		
November 1, 2018		Training of Thai Institute of Directors Association			Other organizations		
		<ul style="list-style-type: none"> ● Director Certification Program (DCP) 221/2016 			Oct. 2018 - Present	<ul style="list-style-type: none"> ● Director-General 	<ul style="list-style-type: none"> ● The Excise Department, Ministry of Finance
		Other Trainings			Oct. 2019 - Present	<ul style="list-style-type: none"> ● Chairman of the Board of Directors 	<ul style="list-style-type: none"> ● Government Savings Bank
		<ul style="list-style-type: none"> ● The Program for Senior Executive on Justice Administration (Class 23), Judicial Training Institute ● Capital Market Leader Program (Class 24), Capital Market Academy ● Financial Analysis Program, Haas School of Business, University of California at Berkeley, U.S.A. 			May 2019 - Present	<ul style="list-style-type: none"> ● Chairman of the Board 	<ul style="list-style-type: none"> ● The Government Lottery Office, Ministry of Finance
					Apr. 2018 - Oct. 2019	<ul style="list-style-type: none"> ● Director 	<ul style="list-style-type: none"> ● State Railway of Thailand
					2017 - Sep. 2018	<ul style="list-style-type: none"> ● Director-General 	<ul style="list-style-type: none"> ● The Treasury Department, Ministry of Finance
					2016 - 2017	<ul style="list-style-type: none"> ● Deputy Permanent Secretary of the Expense and Debt Cluster 	<ul style="list-style-type: none"> ● The Expense and Debt Cluster, Ministry of Finance
					2015 - May 2019	<ul style="list-style-type: none"> ● Director 	<ul style="list-style-type: none"> ● The Government Lottery of Thailand

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
		<ul style="list-style-type: none"> ● Resource management for National Defense (Class 7), Office of the Army Comptroller ● Executive Program (Additional Program) (Class 3), Office of the Civil Service Commission (OCSC) ● Foreign Affairs Executive Program (Class 3), Ministry of Foreign Affairs ● Fundamentals of Public Procurement, United Nations Development Programme: UNDP, Denmark ● Executive Program (Class 46), Office of the Civil Service Commission (OCSC) ● WTO Advanced Regional Workshop on Government Procurement for Asia and Pacific Economies, World Trade Organization: WTO, People's Republic of China 			2015 - 2016 Mar. 2015 - Dec. 2015 2011 - 2015	<ul style="list-style-type: none"> ● Fiscal Analyst Advisory Level ● Deputy Director ● Director 	<ul style="list-style-type: none"> ● The Comptroller General's Department, Ministry of Finance ● The Comptroller General's Department, Ministry of Finance ● Non Budgetary Development Division, The Comptroller General's Department

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
		<ul style="list-style-type: none"> 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 					

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
Mr. Dechapiwat Na Songkhla - Independent Director - Member of the Audit Committee Begin Date January 16, 2019	58	Education	None	None	Other listed companies		
		<ul style="list-style-type: none"> Master of Science (National Development and Project Planning) University of Bradford, United Kingdom 			None		
		<ul style="list-style-type: none"> Bachelor of Science (Mathematics and Economics) University of Surrey, United Kingdom 			Other companies		
		Training of Thai Institute of Directors Association			None		
		<ul style="list-style-type: none"> None 			Other organizations		
		Other Trainings <ul style="list-style-type: none"> The 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 			2017 - Present	<ul style="list-style-type: none"> Director 	<ul style="list-style-type: none"> The Budget Bureau
	2017 - Present	<ul style="list-style-type: none"> Committee member by position 	<ul style="list-style-type: none"> The Office of the National Economic and Social Development Council 				
	2017 - Present	<ul style="list-style-type: none"> Committee member by position 	<ul style="list-style-type: none"> Eastern Economic Corridor Policy Committee 				
	2017 - Present	<ul style="list-style-type: none"> Committee member by position 	<ul style="list-style-type: none"> King Prajadhipok's Institute Council 				
	2017 - Present	<ul style="list-style-type: none"> Committee member by position 	<ul style="list-style-type: none"> The Government Pension Fund (GPF) 				

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
		<ul style="list-style-type: none"> ● Rule of Law for Democracy Course (Class 2), The Constitutional Court of the Kingdom of Thailand 			2017 - Sep. 2019 2015 - 2017 2012 - 2015	<ul style="list-style-type: none"> ● Committee member by position ● Deputy Director ● Senior Advisor 	<ul style="list-style-type: none"> ● National Science and Technology Development Agency ● The Budget Bureau ● The Budget Bureau

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
Mr. Atikom Terbsiri	57	Education	None	None	Other listed companies		
- Director - Member of the Risk Management Committee		<ul style="list-style-type: none"> Master of Business Administration (Finance & International Business), High Distinction, Armstrong University, U.S.A. Bachelor of Business Administration, Assumption University 			Sep. 2019 - Present	<ul style="list-style-type: none"> Chief Operating Officer, Upstream Petroleum and Gas Business Group 	<ul style="list-style-type: none"> PTT Public Company Limited
Begin Date		Training of Thai Institute of Directors Association			2015 - Aug. 2019	<ul style="list-style-type: none"> Member of the Risk Management Committee 	<ul style="list-style-type: none"> Global Power Synergy Public Company Limited
October 1, 2019		<ul style="list-style-type: none"> Director Certification Program (DCP 125/2009) Risk Management Program for Corporate Leaders (RCL 4/2016) Role of the Chairman Program (RCP 41/2017) 			2014 - Aug. 2019	<ul style="list-style-type: none"> Director 	<ul style="list-style-type: none"> Global Power Synergy Public Company Limited
		Other Trainings			2014 - Aug. 2019	<ul style="list-style-type: none"> Chief Executive Officer and the President and Director (Executive), Member of the Risk Management Committee and the Secretary to the Board of Directors 	<ul style="list-style-type: none"> Thai Oil Public Company Limited
		<ul style="list-style-type: none"> Special Lecture on "Global Oil & Gas Markets in Turmoil - Implications for Thailand" by the Petroleum Institute of Thailand (PTIT) 			2014 - Aug. 2019	<ul style="list-style-type: none"> Chairman of the Board 	<ul style="list-style-type: none"> Thai Lube Base Public Company Limited

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
		<ul style="list-style-type: none"> Seminar: 2018 PTIT Annual Dinner: Clean Energy and Smart Transportation: Global Trend for Sustainable World The State, Private Sector and Political Sectors Course, Class 5, National Defense College Advanced Security Management Program, Class 1, National Defense College Capital Market Academy Leader Program, Class 17, Capital Market Academy Executive Education Program, Harvard Business School Harvard University, U.S.A. The Executive Program in Energy Literacy for a Sustainable Future, Class 6, Thailand Energy Academy 			2013 - Sep 2014	<ul style="list-style-type: none"> Senior Executive Vice President, Petrochemicals & Refining Business Unit 	<ul style="list-style-type: none"> PTT Public Company Limited
					Other companies		
					2014 - Sep. 2019	<ul style="list-style-type: none"> Chairman of the Board 	<ul style="list-style-type: none"> TOP SPP Company Limited
					2014 - Aug. 2019	<ul style="list-style-type: none"> Chairman of the Board 	<ul style="list-style-type: none"> Thaioil Marine Company Limited
					2014 - Aug. 2019	<ul style="list-style-type: none"> Chairman of the Board 	<ul style="list-style-type: none"> Thaioil Solvent Company Limited
					2014 - Aug. 2019	<ul style="list-style-type: none"> Chairman of the Board 	<ul style="list-style-type: none"> Thaioil Power Company Limited
					2014 - Aug. 2019	<ul style="list-style-type: none"> Chairman of the Board 	<ul style="list-style-type: none"> LABIX Company Limited
					2014 - Aug. 2019	<ul style="list-style-type: none"> Chairman of the Board 	<ul style="list-style-type: none"> Thai Paraxylene Company Limited

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
		<ul style="list-style-type: none"> Seminar : Anti-corruption : Leadership Role of the Board 			Other organizations		
					Mar. 2019 - Present	<ul style="list-style-type: none"> Director 	<ul style="list-style-type: none"> Board of The Federation of Thai Industries (Term 2018 - 2020)
					May 2018 - Present	<ul style="list-style-type: none"> Member, Backdoor Listing Transaction Committee 	<ul style="list-style-type: none"> Stock Exchange of Thailand
					Jan. 2012 - Present	<ul style="list-style-type: none"> Executive Director 	<ul style="list-style-type: none"> Thailand Energy Academy

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
Mrs. Angkarat Priebjivat - Independent Director - Member of the Audit Committee - Member of the Corporate Governance Committee	65	Education <ul style="list-style-type: none"> ● Ph.D. (Accounting), New York University, U.S.A. ● Master of Accounting Program, Thammasat University ● Bachelor of Business Administration (Accounting), Thammasat University 	None	None	Other listed companies		
		Training of Thai Institute of Directors Association <ul style="list-style-type: none"> ● 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) 			2014 - Present	● Chairperson of Risk Management Committee	● COL Public Company Limited
					2013 - Present	● Independent Director/ Chairperson of Audit Committee	● TISCO Bank Public Company Limited
					2008 - Present	● Independent Director, Chairperson of Audit Committee	● COL Public Company Limited
Begin Date October 1, 2019					2008 - Present	● Independent Director, Chairperson of Audit Committee	● TISCO Financial Group Public Company Limited
					Other companies		
					None		
					Other organizations		
					2018 - Present	● Member of Risk Management Committee	● The Government Pension Fund (GPF)

Name/Position	Age (year)	Education/Training	% of Share holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
		<ul style="list-style-type: none"> ● Director Accreditation Program (DAP 2005) ● Monitoring the Internal Audit Function ● Monitoring the System of Internal Control and Risk Management ● Anti-Corruption for Executive Program 			2018 - Present	<ul style="list-style-type: none"> ● Member of Technical Advisory Committee for Financial Reporting Standards and Member of Advisory Committee for Fund Raising and Listing Department 	<ul style="list-style-type: none"> ● The Securities and Exchange Commission Board
		<p>Other Trainings</p> <ul style="list-style-type: none"> ● Understanding Thailand Data Protection Law and Its Unintended Consequence, ACIS Professional Center Co., Ltd. (ACIS) (2019) ● Board Room: Transforming Corporate Compliance into Corrupt-less Society, Thailand's Private Sector Collective Action Coalition Against Corruption (2018) ● Understanding Cryptocurrency, Blockchain, and Digital Asset and the Opportunities in Thailand, KQ consulting Co., Ltd. (2018) 			2018 - Present	<ul style="list-style-type: none"> ● Independent Director/ Member of Audit Committee/ Chairperson of Risk Management Committee 	<ul style="list-style-type: none"> ● TOT Corporation Public Company Limited
					2016 - Present	<ul style="list-style-type: none"> ● Director/ Member of Audit Committee 	<ul style="list-style-type: none"> ● TSFC Securities Public Company Limited
					2012 - Present	<ul style="list-style-type: none"> ● Member of Audit Committee 	<ul style="list-style-type: none"> ● Thai Public Broadcasting Service (Thai PBS)

Name/Position	Age (year)	Education/Training	% of Share Holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
Mr. Phongsthorn Thavisin	60	Education	0.00255 (101,037 shares)	None	Listed companies		
- Director - President and Chief Executive Officer		<ul style="list-style-type: none"> B.Sc. (Petroleum and Natural Gas Engineering), The Pennsylvania State University, U.S.A. 			Oct. 2018 - Present	<ul style="list-style-type: none"> Senior Executive Vice President working on a secondment as President and Chief Executive Officer of PTT Exploration and Production Public Company Limited 	<ul style="list-style-type: none"> PTT Public Company Limited
Begin Date		Training of Thai Institute of Directors Association			Nov. 2017 - Sep. 2018	<ul style="list-style-type: none"> President, Exploration and Production and Acting Executive Vice President, Business Transformation and Organization Group 	<ul style="list-style-type: none"> PTT Exploration and Production Public Company Limited
October 1, 2018		<ul style="list-style-type: none"> Director Certification Program (DCP) 223/2016 					
	Other Trainings	Jan. 2016 - Oct. 2017	<ul style="list-style-type: none"> Chief Operating Officer, Production Asset and Operations Support Group and acting Executive Vice President, Operations Support Group 	<ul style="list-style-type: none"> PTT Exploration and Production Public Company Limited 			
		<ul style="list-style-type: none"> CERAWeek 2019 in Houston, Texas, U.S.A. Capital Market Leader Program (Class 27), Capital Market Academy 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 					

Director who resigned or retired in year 2019.

Name/Position	Age (year)	Education/Training	% of Share Holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
Mr. Wirat Uanarumit	57	Education	None	None	Other listed companies		
- Ex-Director		<ul style="list-style-type: none"> ● Master of Business Administration, with emphasis in Financial Management, Pennsylvania State University, Pennsylvania, U.S.A. ● Bachelor of Engineering (Electrical Engineering), Chulalongkorn University 			Sep. 2019 - Present	<ul style="list-style-type: none"> ● Director and Chief Executive Officer and President, Secretary to the Board of Directors, Member of Risk Management Committee 	<ul style="list-style-type: none"> ● Thai Oil Public Company Limited
		Training of Thai Institute of Directors Association			Sep. 2019 - Present	<ul style="list-style-type: none"> ● Chief Operating Officer under Chief Operating Officer, Downstream Petroleum Business Group 	<ul style="list-style-type: none"> ● PTT Public Company Limited
		<ul style="list-style-type: none"> ● Anti-Corruption: Leadership Role of the Board ● Director Certification Program Update (DCPU) 5/2015 ● Director Certification Program (DCP) Class 8/2001 ● Audit Committee Program (ACP) 38/2012 ● Ethical Leadership Program (ELP) 7/2017 			Sep. 2019 - Present	<ul style="list-style-type: none"> ● Director and Chairman of the Board 	<ul style="list-style-type: none"> ● Thai Lube Base Public Company Limited

Name/Position	Age (year)	Education/Training	% of Share Holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
		Other Trainings <ul style="list-style-type: none"> ● CERAWEEK 2019 in Houston, Texas, U.S.A. ● Advanced Certificate Course in Politics and Governance in Democratic Systems for Executives, Class 20, King Prajadhipok's Institute ● Thailand CG Forum: Governance as a Driving Force for Business Sustainability, the Stock Exchange of Thailand ● Advanced Management Program, INSEAD Business School, INSEAD Executive Education, French Republic ● Advanced Management Program (Class 184), Harvard Business School, U.S.A. ● Capital Market Academy Leadership Program (Class 4), Capital Market Academy 			Sep. 2019 - Present Oct. 2016 - Aug. 2019 May 2014 - Sep. 2016 Jan. - Sep. 2016 2014 - 2015 Nov. 2011 - Apr. 2014	<ul style="list-style-type: none"> ● Director and member of the Risk Management Committee ● Chief Operation Officer, Upstream Petroleum and Gas Business Group ● Chief Financial Officer ● Director ● Director ● Executive Vice President - Corporate Finance 	<ul style="list-style-type: none"> ● Global Power Synergy Public Company Limited ● PTT Public Company Limited ● PTT Public Company Limited ● Thai Oil Public Company Limited ● Bangchak Petroleum Public Company Limited ● PTT Public Company Limited
					Other companies		
					Nov. 2019 - Present	● Director	● Thaioil Solvent Company Limited
					Nov. 2019 - Present	● Director and Chairman of the Board	● Labix Company Limited

Name/Position	Age (year)	Education/Training	% of Share Holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
		<ul style="list-style-type: none"> ● The Programme for Senior Executives on Justice Administration (Class 16), Judicial Training Institute, National Justice Academy ● The Rules of Law for Democracy (Class 6), College of the Constitutional Court (Jan – Sep 2018) ● Advanced Security Management Program (Class 2), The National Defense College Association of Thailand (NDCAT) ● TLCA Executive Development Program (EDP) (Class 1), Association of Listed Companies, the Stock Exchange of Thailand ● The Joint State - Private Sector Course (Class 2013), National Defense College 			<ul style="list-style-type: none"> Sep. 2019 - Present Sep. 2019 - Present Sep. 2019 - Present Sep. 2019 - Present Nov. 2018 - 2019 Oct. 2016 - 2019 2016 - 2017 Jun. - Oct. 2017 2014 - 2015 	<ul style="list-style-type: none"> ● Director and Chairman of the Board ● Director ● Chairman ● Chairman ● Director 	<ul style="list-style-type: none"> ● TOP SPP Company Limited ● Thai Paralyene Company Limited ● Thaioil Power Company Limited ● Thaioil Marine Company Limited ● PTT LNG Company Limited ● Sakari Resources Limited ● PTT Energy Resources Company Limited ● PTT Global LNG Company Limited ● PTT International Trading Private Limited

Name/Position	Age (year)	Education/Training	% of Share Holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
		<ul style="list-style-type: none"> Executive Management with Business Development and Investment (Class 2), Institute of Business and Industrial Development (IBID) GE Global Customer Summit Crotonville Member, Beta Gamma Sigma (US National Scholastic Honour Society in Business) The Executive Program in Energy Literacy for a Sustainable Future, Class 13, Thailand Energy Academy 			2012 - 2015	<ul style="list-style-type: none"> Director 	<ul style="list-style-type: none"> Star Petroleum Refining Public Company Limited (SPRC)
					Other organizations		
					Nov. 2019 - Present	<ul style="list-style-type: none"> Member of Council 	<ul style="list-style-type: none"> Vidyasirimedhi Institute of Science and Technology (VISTEC)
					Oct. 2019 - Present	<ul style="list-style-type: none"> Director 	<ul style="list-style-type: none"> Power of Innovation Foundation (PIN)
					Oct. 2019 - Present	<ul style="list-style-type: none"> Director 	<ul style="list-style-type: none"> Power of Learning Foundation (PLEARN)
					Sep. 2019 - Present	<ul style="list-style-type: none"> Executive Director 	<ul style="list-style-type: none"> Thailand Swimming Association
					Sep. 2019 - Present	<ul style="list-style-type: none"> Member of Trustee (as Company Representative) 	<ul style="list-style-type: none"> Petroleum Institute of Thailand (PTIT)
					Sep. 2019 - Present	<ul style="list-style-type: none"> Council of Trustee 	<ul style="list-style-type: none"> Thailand Business Council of Sustainable Development (TBCSD)
					2018 - Present	<ul style="list-style-type: none"> Director 	<ul style="list-style-type: none"> The Federation of Thai Industries
					May 2016 - Present	<ul style="list-style-type: none"> Advisory Committee, Trade, Investment Promotion & Business Council 	<ul style="list-style-type: none"> The Federation of Thai Industries

Name/Position	Age (year)	Education/Training	% of Share Holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
					Aug. 2016 - Present	<ul style="list-style-type: none"> ● Advisor to the President 	<ul style="list-style-type: none"> ● Association of Capital Market Academy (ACMA)
					2015 - Present	<ul style="list-style-type: none"> ● Chairman, Thailand - Malaysia Business Council 	<ul style="list-style-type: none"> ● The Federation of Thai Industries
					2015 - Present	<ul style="list-style-type: none"> ● Director under Thai-Chinese Railway Finance and Investment Sub-Committee 	<ul style="list-style-type: none"> ● Thai-Chinese Railway Development Committee
					2013 - Present	<ul style="list-style-type: none"> ● Director & Audit Committee 	<ul style="list-style-type: none"> ● Thailand Management Association (TMA)
					2017 - 2019	<ul style="list-style-type: none"> ● Director 	<ul style="list-style-type: none"> ● Chulalongkorn University Alumni Association (CUAA)
					2014 - 2017	<ul style="list-style-type: none"> ● Director and Treasurer 	<ul style="list-style-type: none"> ● Rayong Science Academy Foundation (RASA) and Rayong Advanced Institute of Science and Technology Foundation (RAIST)
					2015 - 2016	<ul style="list-style-type: none"> ● Director 	<ul style="list-style-type: none"> ● The Joint Standing Committee on Commerce, Industry and Banking

Name/Position	Age (year)	Education/Training	% of Share Holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
					2015 - 2016	<ul style="list-style-type: none"> Advisory Committee, Promoting and Supporting Office of Industries 	<ul style="list-style-type: none"> The Federation of Thai Industries

Name/Position	Age (year)	Education/Training	% of Share Holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
Ms. Panada Kanokwat	70	Education	0.00076	None	Other listed companies		
- Ex-Director		<ul style="list-style-type: none"> ● Master of Business Administration (Finance & Banking), North Texas State University, U.S.A. ● Bachelor of Accounting, Thammasat University 	(30,000 shares)		Apr. 2018 - Apr. 2019	<ul style="list-style-type: none"> ● Member of the Audit Committee 	<ul style="list-style-type: none"> ● TISCO Financial Group Public Company Limited
		Training of Thai Institute of Directors Association			Apr. 2018 - Apr. 2019	<ul style="list-style-type: none"> ● Independent Director and member of the Audit Committee 	<ul style="list-style-type: none"> ● TISCO Bank Public Company Limited
		<ul style="list-style-type: none"> ● Board Matters and Trends (BMT) 6/2018 ● Anti-Corruption: Leadership Role of the Board ● Directors Certification Program Update (DCPU) 2/2014 ● Risk Management Committee Program (RMP) 4/2014 ● Anti-Corruption Focus Group (C-FG) 4/2013 ● Anti-Corruption for Executive (ACEP) 8/2013 			2014 - Apr. 2019	<ul style="list-style-type: none"> ● Member of the Corporate Governance Committee 	<ul style="list-style-type: none"> ● TISCO Financial Group Public Company Limited
					2008 - Apr. 2019	<ul style="list-style-type: none"> ● Independent Director 	<ul style="list-style-type: none"> ● TISCO Financial Group Public Company Limited
					2017 - Apr 2018	<ul style="list-style-type: none"> ● Member of the Corporate Governance Committee 	<ul style="list-style-type: none"> ● Global Power Synergy Public Company Limited

Name/Position	Age (year)	Education/Training	% of Share Holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
		<ul style="list-style-type: none"> Financial Institutions Governance Program (FGP) 2/2011 Directors Certification Program (DCP) 113/2009 Directors Accreditation Program (DAP) 75/2008 			2014 - Apr. 2018	<ul style="list-style-type: none"> Independent Director and Member of the Audit Committee 	<ul style="list-style-type: none"> Global Power Synergy Public Company Limited
		Other Trainings			2015 - 2017	<ul style="list-style-type: none"> Independent Director and Chairman of the Audit Committee 	<ul style="list-style-type: none"> Asia Biomass Public Company Limited
		<ul style="list-style-type: none"> Executive Program in Capital Market Academy Leadership Program (Class 2), Capital Market Academy 			2013 - 2014	<ul style="list-style-type: none"> Member of the Audit Committee 	<ul style="list-style-type: none"> TISCO Financial Group Public Company Limited
		<ul style="list-style-type: none"> Executive Program in International Management, Stanford-National University of Singapore, Republic of Singapore 			2013 - 2014	<ul style="list-style-type: none"> Member of the Audit Committee 	<ul style="list-style-type: none"> TISCO Bank Public Company Limited
		<ul style="list-style-type: none"> Building, Leading & Sustaining the Innovation Organization, Sloan School of Management, Massachusetts Institute of Technology (MIT), U.S.A. 			2008 - 2014	<ul style="list-style-type: none"> Independent Director and Member of the Audit Committee 	<ul style="list-style-type: none"> TISCO Bank Public Company Limited
					Other companies		
					None		

Name/Position	Age (year)	Education/Training	% of Share Holding	Family Relationship among Executives	Working experiences in the 5 preceding years		
					Period	Position	Function/Company/Type of Business
					Other organizations		
					2014 – Jan. 2018	<ul style="list-style-type: none"> Member of the Risk Management Sub-committee 	<ul style="list-style-type: none"> The Government Pension Fund (GPF)

Criminal offense record during the past 10 years

- a) Being adjudged of convicting a crime or being on trial for convicting a crime No
- b) Being adjudged bankrupt or a receiver is appointed No
- c) Being a management in the company or partnership which is adjudged bankrupt or a receiver is appointed No

Remarks: The name and number(s) of the authorized directors who may sign to bind the Company from November 7, 2019 are Mr. Atikom Terbsiri, Mr. Twarath Sutabutr, and Mr. Pitipan Teparimargorn.

Two of the above three directors can sign jointly and affix the Company's seal, or Mr. Phongstorn Thavisin, the President and Chief Executive Officer, can sign singly.

2. Management

As of January 1, 2020, PTTEP management team had 19 personnel, as defined by the Capital Market Supervisory Board. Details are shown below.

Name/Position	Age (year)	Education/Training	% of Shareholding	Family Relationship among Directors and Executives	Working Experiences in the 5 Preceding Years		
					Period	Position	Function/ Company/ Type of Business
Mr. Phongsthorn Thavisin President and Chief Executive Officer	Please see part 1 for details						
Mr. Vuthiphon Thuampoomngam Executive Vice President, Human Resources, Assurance, and Transformation Group	59	<ul style="list-style-type: none"> B.Sc. (Material Science), Chulalongkorn University M.E. (Chemical Engineering), Chulalongkorn University 	0.0004 (15,650 shares)	None	Jan 2020 - Present Jan. - Dec. 2019 Oct. - Dec.2018 Oct. 2018 Aug. - Sep. 2018 Jan. - Jul. 2018 Jan. 2015 - Dec. 2017	<ul style="list-style-type: none"> Executive Vice President, Human Resources, Assurance, and Transformation Group Chief Operating Officer, Production Asset and Supply Chain Management Group Executive Vice President, Production Asset Group Acting Senior Vice President, International Asset Executive Vice President, Engineering and Development Group and Acting Senior Vice President, Development Project Division Executive Vice President, Engineering and Development Group Senior Vice President, Thai Offshore Asset 	PTTEP PTTEP PTTEP PTTEP PTTEP PTTEP

Name/Position	Age (year)	Education/Training	% of Shareholding	Family Relationship among Directors and Executives	Working Experiences in the 5 Preceding Years		
					Period	Position	Function/ Company/ Type of Business
Mr. Montri Rawanchaikul Executive Vice President, Production Asset Group	55	<ul style="list-style-type: none"> ● B.Sc (Physics), Chiang Mai University ● M.Sc. (Exploration Geophysics), University of New South Wales, Australia 	0.0008 (32,050 shares)	None	Jan. 2020 - Present	● Executive Vice President, Production Asset Group	PTTEP
					Oct. 2017 - Dec. 2019	● Executive Vice President, Strategy and Business Development Group	PTTEP
					Aug. - Dec. 2018	● Project Champion, SPEND SMART Project	PTTEP
					Nov. 2017- Sep. 2018	● Acting Senior Vice President, New Business Unit	PTTEP
					Oct. 2016 - Sep. 2017	● Acting Executive Vice President, Strategy and Business Development Group	PTTEP
					Sep. - Oct. 2016	● Senior Vice President, International Asset	PTTEP
					Jul. - Aug. 2016	● Senior Vice President, attached to Production Asset and Operations Support Group	PTTEP
Jul. 2013 - Jul. 2016	● Senior Vice President, Australia Asset, seconded as General Manager, Australia Asset, PTTEP Australasia, Australia	PTTEP					

Name/Position	Age (year)	Education/Training	% of Shareholding	Family Relationship among Directors and Executives	Working Experiences in the 5 Preceding Years		
					Period	Position	Function/ Company/ Type of Business
Mr. Kanok Intharawijitr Executive Vice President, Geosciences, Subsurface and Exploration Group	58	<ul style="list-style-type: none"> B.Sc. (Geology), Chiang Mai University 	0.0010 (41,531 shares)	None	Oct. 2018 - Present	<ul style="list-style-type: none"> Executive Vice President, Geosciences, Subsurface and Exploration Group 	PTTEP
					Jul. - Sep. 2018	<ul style="list-style-type: none"> Acting Executive Vice President, Geosciences and Exploration Group 	PTTEP
					Jan. 2016 - Jun. 2018	<ul style="list-style-type: none"> Senior Vice President, Geosciences and Technology Division 	PTTEP
					Nov. 2014 - Dec. 2015	<ul style="list-style-type: none"> Senior Vice President, Exploration Project Division 	PTTEP

Name/Position	Age (year)	Education/Training	% of Shareholding	Family Relationship among Directors and Executives	Working Experiences in the 5 Preceding Years		
					Period	Position	Function/ Company/ Type of Business
Mr. Chayong Borisuitsawat Executive Vice President, Engineering and Development Group	52	<ul style="list-style-type: none"> B.E. (Petroleum), Chulalongkorn University 	0.0014 (55,096 shares)	None	Jan. 2020 - Present	<ul style="list-style-type: none"> Executive Vice President, Engineering and Development Group 	PTTEP
					Nov. 2018 - Dec. 2019	<ul style="list-style-type: none"> Executive Vice President, Business and Organization Transformation Group 	PTTEP
					Oct. 2018	<ul style="list-style-type: none"> Executive Vice President, Operations Support Group 	PTTEP
					Nov. 2017 - Sep. 2018	<ul style="list-style-type: none"> Acting Executive Vice President, Operations Support Group and assigned as Project Champion, SPEND SMART Project 	PTTEP
					Sep. 2016 - Oct.2017	<ul style="list-style-type: none"> Senior Vice President, attached to President and Chief Executive Officer, assigned as Project Champion, SPEND SMART Project 	PTTEP
					Jan.2015 - Aug. 2016	<ul style="list-style-type: none"> Senior Vice President, Thai Onshore Asset 	PTTEP

Name/Position	Age (year)	Education/Training	% of Shareholding	Family Relationship among Directors and Executives	Working Experiences in the 5 Preceding Years		
					Period	Position	Function/ Company/ Type of Business
Mr. Suksant Ongvises Executive Vice President, Operations Support Group	55	<ul style="list-style-type: none"> B.E. (Chemical), University of Newcastle, Australia 	0.0007 (27,681 shares)	None	Jan. 2020 - Present	<ul style="list-style-type: none"> Executive Vice President, Operations Support Group 	PTTEP
					Jun. - Dec. 2019	<ul style="list-style-type: none"> Executive Vice President, Engineering, Development and Operations Group 	PTTEP
					Oct. 2018 - May 2019	<ul style="list-style-type: none"> Acting Executive Vice President, Engineering, Development and Operations Group 	PTTEP
					Mar. 2017- Oct. 2018	<ul style="list-style-type: none"> Senior Vice President, Engineering and Construction Division 	PTTEP
					Apr.- Sep. 2018	<ul style="list-style-type: none"> Acting Vice President, M3 Development Project 	PTTEP
					Jul. 2016 - Feb. 2017	<ul style="list-style-type: none"> Acting Senior Vice President, Engineering and Construction Division 	PTTEP
					Jan. 2015 - Jun. 2016	<ul style="list-style-type: none"> Vice President, Algeria Development Project 	PTTEP

Name/Position	Age (year)	Education/Training	% of Shareholding	Family Relationship among Directors and Executives	Working Experiences in the 5 Preceding Years		
					Period	Position	Function/ Company/ Type of Business
Ms. Natruedee Khositaphai Executive Vice President, Strategy and Business Development Group	54	<ul style="list-style-type: none"> ● B.E. (Petroleum), Chulalongkorn University ● M.B.A. (Business Administration), Sasin Graduate Institute of Business Administration, Chulalongkorn University 	0.0030 (117,457 shares)	None	Jan. 2020 - Present	● Executive Vice President, Strategy and Business Development Group	PTTEP
					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
					Jan. 2015 - Apr. 2016	● Vice President, Strategic Planning Department	PTTEP
Feb. - Dec. 2014	● Vice President, International Asset Planning Department	PTTEP					

Name/Position	Age (year)	Education/Training	% of Shareholding	Family Relationship among Directors and Executives	Working Experiences in the 5 Preceding Years					
					Period	Position	Function/ Company/ Type of Business			
Mr. Sumrid Sumneing Executive Vice President, Finance and Accounting Group (The person supervising Finance and accounting)	55	Education	0.0002 (7,000 shares)	None	Jan. 2019 - Present	<ul style="list-style-type: none"> Executive Vice President, Finance and Accounting Group 	PTTEP			
		<ul style="list-style-type: none"> M.B.A. (Business Administration), Kasetsart University B.Sc. (Accounting), Thammasat University 						<ul style="list-style-type: none"> Executive Vice President, Corporate Finance Accounting Department Vice President of Affiliates Financial Management Department and Vice President of Financial Strategy & Policy Department 	PTT PTT	
		Training								<ul style="list-style-type: none"> Capital Market Academy 29/2019 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 (class 180/2013), Thai Institute of Directors (IOD) Leadership Development Program- Center for Creative Leadership (CCL) Finance Executive Program (FINEX 21), The Thai Institute of Banking and Finance Association

Name/Position	Age (year)	Education/Training	% of Shareholding	Family Relationship among Directors and Executives	Working Experiences in the 5 Preceding Years		
					Period	Position	Function/ Company/ Type of Business
Mrs. Suchitra Suwansinpan Executive Vice President, attached to President and Chief Executive Officer	59	<ul style="list-style-type: none"> B.E. (Chemical), King Mongkut Institute of Technology Thonburi M.E. (Energy Technology), Asian Institute of Technology 	0.0027 (106,765 shares)	None	Jan. 2020 - Present	<ul style="list-style-type: none"> Executive Vice President, attached to President and Chief Executive Officer 	PTTEP
					Oct. 2016 - Dec. 2019	<ul style="list-style-type: none"> Executive Vice President, seconded as Managing Director, PTT Global LNG 	PTT Global LNG
					Dec. 2015 - Oct. 2016	<ul style="list-style-type: none"> Executive Vice President, Strategy and Business Development Group 	PTTEP
					2011 - Nov. 2015	<ul style="list-style-type: none"> Senior Vice President, Corporate Strategy Division 	PTTEP
Mr. Yongyos Krongphanich Executive Vice President, seconded at PTT PLC.	59	<ul style="list-style-type: none"> B.Sc. (Accounting), Chulalongkorn University M.Sc. (Accounting), Thammasat University 	0.0027 (106,445 shares)	None	Jan. 2019 - Present	<ul style="list-style-type: none"> Executive Vice President, seconded as Executive Vice President, Group Corporate Finance and Strategy at PTT PLC 	PTT
					Oct. - Dec. 2018	<ul style="list-style-type: none"> Executive Vice President, Finance and Accounting Group 	PTTEP
					Oct. - Dec. 2018	<ul style="list-style-type: none"> Acting Senior Vice President, Finance Division 	PTTEP
					Jul. 2014 - Sep. 2018	<ul style="list-style-type: none"> Senior Vice President, Finance Division 	PTTEP
					Jan. 2013 - Jun. 2014	<ul style="list-style-type: none"> Senior Vice President, Finance and Strategic Information Technology Division 	PTTEP

Name/Position	Age (year)	Education/Training	% of Shareholding	Family Relationship among Directors and Executives	Working Experiences in the 5 Preceding Years		
					Period	Position	Function/ Company/ Type of Business
Ms. Jaroonsri Wankertphon Senior Vice President, Accounting Division (The person supervising accounting)	54	<ul style="list-style-type: none"> M.Sc. (Financial Accounting), Thammasat University B.B.A. (Business Administration), Chulalongkorn University B.B.A. (Accounting), Krirk University 	0.0018 (73,228 shares)	None	Jan. 2019 - Present	<ul style="list-style-type: none"> Senior Vice President, Accounting Division 	PTTEP
		Oct. - Dec. 2018 Jul. 2016 - Sep. 2018 Oct. 2015 - Jun. 2016 Apr. 2015 - Oct. 2015 Jul. 2014 - Mar. 2015 Jul. 2013 - Jun. 2014			<ul style="list-style-type: none"> Senior Vice President, Accounting Division and Acting Vice President, Financial Accounting Department Senior Vice President, Accounting Division Vice President, Accounting Policy and Solution Department, and Acting Senior Vice President, Accounting Division Vice President, Accounting Policy and Solutions Department Vice President, Accounting Policy and Solutions Department and Acting Vice President, Managerial and Accounting Department Vice President, Managerial and Accounting Department 	PTTEP PTTEP PTTEP PTTEP PTTEP PTTEP	
		Training <ul style="list-style-type: none"> Financial & Fiscal Management Program for Senior Executive by The Comptroller General's Department 6/2019 Director Certification Program by Thai Institute of Directors (DCP) 220/2016 EP LEAD III Leadership Development Program by IMD TLCA Executive Development Program by Thai Listed Companies Association 					

Name/Position	Age (year)	Education/Training	% of Shareholding	Family Relationship among Directors and Executives	Working Experiences in the 5 Preceding Years		
					Period	Position	Function/ Company/ Type of Business
		Continuing Professional Development (CPD) 2019 <ul style="list-style-type: none"> ● TFRS 62 – CPD (Accounting) 6 hours ● TAS 12 – CPD (Accounting) 7 hours ● PwC Thailand's 2019 Symposium: 'Connecting the dots: Managing corporate challenges in 2020 and beyond'- Financial Reporting Update - CPD (Accounting) 6.30 hours ● IFRS Masterclass : Updates and Practical Applications 2019/2020 An Accountant with criteria specified by the Department of Business Development					

Name/Position	Age (year)	Education/Training	% of Shareholding	Family Relationship among Directors and Executives	Working Experiences in the 5 Preceding Years		
					Period	Position	Function/ Company/ Type of Business
Mrs. Chanamas Sasnanand Senior Vice President, Finance Division	50	<ul style="list-style-type: none"> B.B.A. (Business Administration), Chulalongkorn University M.B.A. (Business Administration), University of South Carolina, U.S.A. 	0.0011 (45,411 shares)	None	Jan. 2019 - Present	• Senior Vice President, Finance Division	PTTEP
					Apr. - Dec. 2018	• Senior Vice President, Internal Audit Division	PTTEP
					Jan. - Apr. 2018	• Acting Senior Vice President, Internal Audit Division	PTTEP
					Jul. 2014 - Dec. 2017	• Vice President, Capital and Investor Relations Department	PTTEP
					2010 - Jun. 2014	• Vice President, Finance Department	PTTEP
Mrs. Netrsuda Pokkasorn Vice President, Insurance Department	54	<ul style="list-style-type: none"> B.Sc. (Economics), Chulalongkorn University M.Sc. (Economics), University of Missouri, U.S.A. 	0.0017 (66,005 shares)	None	Aug. 2017 - Present	• Vice President, Insurance Department	PTTEP
					Feb. 2011 - Jul. 2017	• Manager, Insurance	PTTEP
Mr. Anutra Bunnag Vice President, attached to Finance Division, assigned as Managing Director, PTTEP Treasury Center Company Limited	56	<ul style="list-style-type: none"> B.Sc. (Chemistry), University of Bradford M.Sc. (Finance), University of Massachusetts, U.S.A. 	-	None	May 2017 - Present	• Vice President, attached to Finance Division, assigned as Managing Director	PTTEP Treasury Center
					Oct. 2016 - Apr. 2017	• Vice President, Treasury Department	PTTEP
					2011 - Sep. 2016	• Vice President, seconded as Vice President, Corporate Administration and Finance Department	Energy Complex

Name/Position	Age (year)	Education/Training	% of Shareholding	Family Relationship among Directors and Executives	Working Experiences in the 5 Preceding Years		
					Period	Position	Function/ Company/ Type of Business
Mr. Sermsak Satchawannakul Vice President, Financial Accounting Department	51	<ul style="list-style-type: none"> ● B.Sc.(Accounting), Thammasat University ● M.Sc. (Business Administration), Thammasat University 	0.0011 (45,215 shares)	None	Jan. 2019 - Present	● 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, Union of Myanmar	PTTEP
					Feb. 2014 - Jun. 2015	● Vice President, IT and Information Management Department	PTTEP
Ms. Pratamaporn Deesrinthum Vice President, Managerial Accounting Department	47	<ul style="list-style-type: none"> ● B.Sc. (Accounting), Chulalongkorn University ● M.Sc. (Business Administration), Thammasat University 	0.0013 (53,249 shares)	None	Apr. 2018 - Present	● 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
					Apr. 2016 – May 2017	● Senior Accountant, assigned as Finance and Accounting Manager PTTEP Australasia, Australia	PTTEP
					Jan. – Mar. 2016	● Senior Accountant	PTTEP
					Jul. 2013 – Dec. 2015	● Manager, Group Accounting Section	PTTEP

Name/Position	Age (year)	Education/Training	% of Shareholding	Family Relationship among Directors and Executives	Working Experiences in the 5 Preceding Years		
					Period	Position	Function/ Company/ Type of Business
Mrs. Monsalai Tongsari Vice President, Accounting Policy and Solutions Department	53	<ul style="list-style-type: none"> • B.BA (Accounting), Assumption University • M.B.A. (Financial), Assumption University 	0.0025 (100,480 shares)	None	Jul. 2019 - Present	• Vice President, Accounting Policy and Solutions Department	PTTEP
					Dec. 2016 - Jun. 2019	• Manager, Thai Offshore Asset Accounting Section	PTTEP
					Apr. - Nov. 2016	• Manager, Accounts Receivable Section	PTTEP
					Jul. 2013 - Mar. 2016	• Manager, Upstream Accounting Section	PTTEP
Ms. Nuchanong Sangkeaw Acting Vice President, Capital Market and Financial Planning Department	42	<ul style="list-style-type: none"> • B.Sc. (Economic Law), Chulalongkorn University • B.Sc.(Accounting), Thammasat University • M.PA. (Accounting), The University of Texas at Austin 	0.0001 (4,605 shares)	None	Jan. 2020 - Present	• 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
					May 2011 - Apr. 2015	• Manager, Investor Relations Section	PTTEP
Mrs. Yada Vudhivorn Acting Vice President, Tax Department	40	<ul style="list-style-type: none"> • LL.B (Law), Thammasat University • LL.M (Law), University of London • LL.M (Law), Northwestern University 	0.000001 (50 shares)	None	Sep. 2019 - Present	• Acting Vice President, Tax Department	PTTEP
					Aug. 2015 - Aug. 2019	• Manager, Tax Planning Section	PTTEP

2.2 As of January 1, 2020, there were 3 of PTTEP management, as defined by the Capital Market Supervisory Board, who retired or rotated during the Year 2019. Details are shown below.

Name/Position	Age (year)	Education/Training	% of Shareholding	Family Relationship among Directors and Executives	Working Experiences in the Past 5 Years		
					Period	Position	Function/ Company/ Type of Business
Management Who Retired or Rotated or Resign During the Year 2019							
Mr. Chatchawal Eimsiri Executive Vice President, attached to President and Chief Executive Officer (Retired)	60	<ul style="list-style-type: none"> B.Sc. (Mathematics), Imperial Collage of Science and Technology, University of London M.Sc. (Operation Research), London School of Economics and Political Science, University of London, United Kingdom IOD: DCP 91 (2007)	0.0005 (19,287 shares)	None	Oct. - Dec. 2019 Feb. 2015 - Sep. 2019 Aug. 2014 - Jan. 2015	<ul style="list-style-type: none"> Executive Vice President, attached to President and Chief Executive Officer Executive Vice President, seconded as President, PTT Natural Gas Distribution Company Limited Executive Vice President, attached to President and Chief Executive Officer 	PTTEP PTT NGD PTTEP
Mrs. Maneeya Srisukhumbowornchai Acting Senior Vice President, Corporate Secretary Division, assigned as Company Secretary (Rotated)	45	<ul style="list-style-type: none"> B.Sc. (Accounting), Chulalongkorn University M.Sc. (Business Administration), Thammasat University 	-	None	Sep. 2019 - Present May 2015 - Aug.2019 Oct. 2018 - Jun.2019 Jan.2014 - Apr. 2015	<ul style="list-style-type: none"> Acting Senior Vice President., Corporate Secretary Division, assigned as Company Secretary Vice President, Tax Department Acting Vice President, Accounting Policy and Solutions Department Manager, Tax Compliance 	PTTEP PTTEP PTTEP PTTEP

Name/Position	Age (year)	Education/Training	% of Shareholding	Family Relationship among Directors and Executives	Working Experiences in the 5 Preceding Years		
					Period	Position	Function/ Company/ Type of Business
Ms. Kanchanan Panananda Vice President, attached to Malaysia Asset, seconded as Business Support at PTTEP Sarawak Oil Limited, Malaysia (Rotated)	49	<ul style="list-style-type: none"> ● B.Sc. (Accounting), Thammasat University ● M.Sc. (Business Administration), Thammasat University 	0.0014 (56,604 shares)	None	Jul. 2019 - Present Jan. 2018 - Jul. 2019 Apr. 2015 - Dec. 2017 Jan. 2014 - Mar. 2015	<ul style="list-style-type: none"> ● Vice President, attached to Malaysia Asset, seconded as Business Support at PTTEP Sarawak Oil Limited, Malaysia ● Vice President, Capital and Investor Relations Department ● Vice President, Managerial Accounting Department ● Manager, Accounting Policy 	PTTEP Sarawak Oil Limited, Malaysia PTTEP PTTEP PTTEP

Attachment 2: Directors of Subsidiaries and Associated Companies¹

1. **List of PTTEP's Subsidiaries:** As of December 31, 2019, there were 81 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	PBL	PBO
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Mr. Vuthiphon Thuampoomngam			/	/	/	/	/	/			/	/			
Mr. Nirandom Rojanasomsith	/	/	/	/	/	/	/	/							
Ms. Kanita Sartwattayu			/	/	/	/	/	/							
Mr. Ryan Hartfield	/	/	/	/	/	/	/	/							
Mr. Peerapong Hansakwong									/	/					
Ms. Sirlene Santos Brêtas de Noronha													/		
Mr. José António da Cruz Mendes e Souza														/	/
Mr. Nopasit Chaiwanakupt											/	/			

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														
	PTTEP CA	PTTEP CIF	CEEAL	PTTEP MZA1	CEMROL	PTTEP FH	PTTEP HK	PTTEP HKO	PTTEP MENA	PTTGLI	CEKL*	PTTEPO	PTTEPH	SHL	PTTEP IH
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ms. Ratchada Lertwanichwatana	/		/	/	/										
Mr. Don Greenfield	/														
Ms. Nuchanong Sangkeaw		/													
Mr. Chaiyaphon Chirakorn		/													
Ms. Stella Kattashi			/	/	/										
Mr. Montana Chai-oon						/									
Ms. Chawiwat Jiraratchwaro						/									
Mr. Montri Rawanchaikul							/								
Ms. Jaroonsri Wankertphon							/						/		
Mr. Vuthiphon Thuampoomngam								/							
Mr. Nopasit Chaiwanakupt								/							
Mr. Anusorn Tepjitar									/						
Ms. Pratamaporn Deesrinthum									/						
Mr. Luck Tanasomwang										/					
*In process of company dissolution											/				
Mr. Soraphol Asavathevakiet												/			
Mr. Polasant Kullavanijaya												/		/	
Mr. Nopadon Chinabutr														/	
Ms. Monsalai Tongsari															/

Remark: / = Director

Name (the list only includes directors designated by the PTTEP Group)	Subsidiary														
	PTTEP ID	PTTEP AI	JV Marine	PTTEP NL	ATL	PTTEP SVPC	PTTEP SD	PTTEP AG	PTTEP HV	PTTEP HL	PTTEP KV	PTTEP SV	PTTEP SA	PTTEP SMD	PTTEP ML
	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Mr. Sermsak Satchawannakul	/														
Mr. Grinchai Hattagam	/						/							/	/
Mr. Suksant Ongvises		/		/				/							
Mr. Vuthiphon Thuampoomngam			/												
Mr. Denkey Thatchaichawalit			/												
Mr. Noppadol Pinpipat				/											
Mr. Piya Sukhumpanumet					/								/		
Mr. Kittisak Hiranyapraphip					/						/				
Mr. Polasant Kullavanijaya						/									
Ms. Jaroonsri Wankertphon							/								
Mr. Peerapong Chailapo								/							
Mr. Porntep Kongkapetchawan									/	/		/			
Mr. Anun Chonchawalit											/			/	/
Mr. Prawat Thong-In													/		

Remark: / = Director

Name (the list only includes directors designated by the PTTEP Group)	Subsidiary														
	PTTEP SS	PTTEP SM	PBC	PKC	PANG	POGHC*	PTTEP MEP	CPOC	PTTEP NH	PTTEP BI	PTTEP NC	NATUNA	PHBV	PEC	POC
	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Mr. Sermsak Satchawannakul	/	/													
Mr. Grinchai Hattagam	/	/										/			
Mr. Anun Chonchawalit			/	/	/			/	/					/	/
Mr. Direk Wangudomsuk			/	/	/								/	/	/
Mr. António José da Costa Silva			/	/	/								/	/	/
*In process of company dissolution						/									
Mr. Fernando António da Silva Barata Alves			/	/	/									/	/
Mr. Alfredo Coelho Ferreira dos Santos			/	/	/									/	/
Mr. Noppadol Pinpipat							/			/					
Mr. Piya Wichitchanya							/								
Mr. Vuthiphon Thuampoomngam								/							
Mr. Chalongrut Ya-anan										/					
Ms. Ratchada Lertwanichwatana											/				
Mr. Ronald Posthumus											/				
Vistra Management Services (Netherlands) B.V.											/		/		
Mrs. Yvonne Maria Wimmers-Thenus												/			
Mr. Marinus Carel Eduard van Gendt													/		

Remark: / = Director

Name (the list only includes directors designated by the PTTEP Group)	Subsidiary														
	PGC	PSC	PSP	PTTEP Services	PTTEP TC	PTTEPI	PTTEP G7	PTTEPS	Orange	PTTEP BC	PTTEP EH	PTTEP ED	EP-Tech	EnCo	PTT GL
	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Mr. Anun Chonchawalit	/	/	/												
Mr. Direk Wangudomsuk	/	/	/												
Mr. António José da Costa Silva	/	/	/												
Mr. Fernando António da Silva Barata Alves	/	/	/												
Mr. Alfredo Coelho Ferreira dos Santos	/	/	/												
Mr. Adisorn Smathimanant				/											
Mr. Putikarn Aurat				/											
Ms. Chanamas Sasnanand					/										
Mr. Anutra Bunnag					/										
Mr. Chayong Borisuitsawat						/								/	
Mr. Chula Manonda						/							/		
Mr. Denkey Thatchaichawalit							/		/						
Mr. Veerawat Aumsoi								/							
Mr. Nopadon Chinabutr								/							
Mr. Nirandorn Rojanasomsith									/						
Mr. Sermsak Satchawannakul									/						
Mr. Terapol Phoonsiri										/					
Mr. Chalongrut Ya-anan										/					
Mr. Suksant Ongvises											/				
Ms. Kanita Sartwattayu											/	/			
Mr. Kitchai Pitiwiwat												/			
Mr. Bundit Pattanasak													/		
Mr. Thanasit Vichaiapirojwong														/	
Mr. Anusorn Wuthijaroen														/	
Mr. Jaroonsri Wankertphon														/	
Mr. Vuthiphon Thuampoomngam															/
Mr. Montri Rawanchaikul															/

Remark: / = Director

Name (the list only includes directors designated by the PTTEP Group)	Subsidiary					
	ARV	APICO KL	Cove	PTTEP SP	APICO	APICO KH
	76	77	78	79	80	81
Mr. Bundhit Eua-arporn	/					
Mr. Bundit Pattanasak	/					
Ms. Chanamas Sasnanand	/					
Ms. Ratchada Lertwanichwatana			/			
Mr. Anun Chonchawalit			/			
Mr. Anutra Bunnag				/		
Mr. Nopadon Chinabutr				/		
PTTEP FH					/	
PTTEP ID					/	
APICO						/
Mr. Dwight C. Johnson		/				

Remark: / = Director

2. List of PTTEP's Associated Companies: As of December 31, 2019, there were 20 associated companies.

Name (the list only includes directors designated by the PTTEP Group)	Associated Company											
	PTT Digital	B8/32 Partners	MGTC	Erawan FSO Bahamas	SPSE	POHOL	PDO	OLNG	AGP	MZ LNG 1	MOZ LNG1 Holding	MOZ LNG1 Financing
	1	2	3	4	5	6	7	8	9	10	11	12
Mr. Chayong Borisuitsawat	/											
Mr. Sermsak Satchawannakul		/										
Mr. Denkey Thatchaichawalit		/		/								
Mr. Piya Sukhumpanumet			/									
Mrs. Pariyachat Oonkhanond*			/									
Mr. Siriphong Fuenglikhit					/							
Mr. António José da Costa Silva						/	/	/	/			
Mr. Fernando António da Silva Barata Alves						/						
Mr. Anun Chonchawalit											/	
Ms. Patchara Romyanan										/		
Ms. Kanchanan Panananda												/

Remarks / = Director

* = Alternate Director

Eight associated companies which do not have any directors from PTTEP are:

- (1) TPC, Asia Pacific Marine Service and PL9SB 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 shareholder.

Attachment 3: Details of Head of the Internal Audit Division and Head of the the Compliance Function
1. Details of Head of the Internal Audit Division as of January 1, 2020 are shown in the table below.

Name/Position	Education	Trainings	Work Experience in the Past 5 Years	
			Period	Position/Unit
Ms. Jutima Lalitkul Senior Vice President, Internal Audit Division	<ul style="list-style-type: none"> Bachelor of Business Administration, Thammasat University 	<ul style="list-style-type: none"> M&A Cycle for Internal Auditors, PWC M&A and divestment process, PTTEP Overview on Laws & Regulations relating to State Enterprises, PTTEP CAE Forum 2019: Winning 5G and the 4th Industrial Revolution, The Stock Exchange of Thailand Towards Sustainable Management in a new era, Asian Confederation of Institutes of Internal Auditors IIA Thailand Annual Conference 2019, The Institute of Internal Auditors of Thailand Trade Competition Law, Department of Internal Trade Block Chain Community Bound, Big Data and Data Analytics, and BOT Cyber Security, Bank of Thailand (BOT) Disruption a New World Order, Blacksheep Runs Business EP LEAD III Leadership Development Program, IMD 	Nov. 2019 - Present Jan. - Oct. 2019 Apr. 2017 - Dec. 2018 Jan. 2015 - Mar. 2017 Feb. 2011 - Dec. 2014	<ul style="list-style-type: none"> Senior Vice President, Internal Audit Division, PTTEP Specialist, Internal Audit, Internal Audit Division, PTTEP Vice President, Global Supply Chain Solutions Department, PTTEP Vice President, Procurement and Contracts Department, PTTEP Vice President, Procurement Department, PTTEP

In addition, details of Ms. Yaninee Wajeepratubjit who held the position of Head of the Internal Audit Division during January - October 2019 are shown in the table below.

Name/Position	Education	Trainings	Work Experience in the Past 5 Years	
			Period	Position/Unit
Ms. Yaninee Wajeepratubjit Specialist	<ul style="list-style-type: none"> ● M.B.A. (Business Administration), Chulalongkorn University ● B.Acc. (Accounting), University of the Thai Chamber of Commerce 	<ul style="list-style-type: none"> ● M&A Cycle for Internal Auditors, PWC ● M&A and divestment process, PTTEP ● Overview on Laws & Regulations relating to State Enterprises, PTTEP ● Block Chain Community Bound, Big Data and Data Analytics, and BOT Cyber Security, Bank of Thailand (BOT) ● Disruption a New World Order, Blacksheep Runs Business ● Safety Officer Training for Management Level ● The 4 Disciplines of Execution, PacRim Consultancy Co., Ltd. ● Stakeholders in the Supply Chain Management, CP Training Consortium Ltd. ● EP-LEAD III Program, IMD ● Behavioral Based Safety (BBS), Ken Knowledge International Pte Ltd. ● GRC Online Training: Anti-Corruption, PTTEP 	Nov. 2019 - Present	<ul style="list-style-type: none"> ● Specialist, PTTEP
			Jan. - Oct. 2019	<ul style="list-style-type: none"> ● Acting Senior Vice President, Internal Audit Division, PTTEP
			Jul. - Dec. 2018	<ul style="list-style-type: none"> ● Acting Senior Vice President, Enterprise Risk Management and Internal Control Division, PTTEP
			Jul. 2015 - Jun. 2018	<ul style="list-style-type: none"> ● Vice President, attached to International Asset, seconded as Senior Manager, Business Support Division, Carigali-PTTEPI Operating Company Sdn. Bhd., (CPOC), Malaysia, PTTEP
			Nov. 2011 - Jun. 2015	<ul style="list-style-type: none"> ● Vice President, Myanmar Business Services Department, Myanmar Asset, PTTEP

Attachment 4: Asset Revaluation

- None -

Attachment 5: Supplemental Information on Petroleum Exploration and Production Activities (Unaudited)**(A) PTTEP and Our Subsidiaries' Petroleum Reserves Report as of December 31, 2019**

The total Proved Reserves of PTTEP and our subsidiaries as of December 31, 2019 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, 2019, the total amount of Proved Reserves of PTTEP Group's projects¹ was 310 million stock-tank barrels (MMSTB) of crude oil and condensate², and 5,097 billion standard cubic feet (BSCF) of natural gas or 830 million barrels of oil equivalent (MMBOE). The total amount of Proved Reserves in terms of oil equivalent in consolidation was therefore 1,140 MMBOE. Proved Reserves of crude and condensate are approximately 27% while, for gas, are 73% of the total Proved Reserves in terms of oil equivalent.

In 2019, the total production of PTTEP Group¹ was 151 MMBOE, consisting of 41 MMSTB of crude oil and condensate² and 690 BSCF or 110 MMBOE of natural gas. This was equivalent to the production rate of approximately 413,640 barrels of oil equivalent per day (BOED), which was approximately 54,255 BOED or 15.1% increase from the previous year. The increase was mainly due to the acquisition of Murphy Oil Corporation in Malaysia and Partex Holding B.V.

¹ Include APICO Joint Venture project

² Include the proved reserves and production of LPG

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 reserves of consolidated companies									
As of December 31, 2017	99	57	156	1,824	1,225	3,049	398	233	631
1) Revision of previous estimates	19	5	24	108	51	159	36	14	50
2) Improved recovery	5	0	5	57	13	70	14	2	16
3) Extensions and discoveries	14	1	15	368	3	371	72	1	73
4) Purchases/Sales of Petroleum in place	6	(8)	(2)	249	-	249	47	(9)	38
5) Production	(27)	(7)	(34)	(425)	(187)	(612)	(97)	(34)	(131)
As of December 31, 2018	116	48	164	2,181	1,105	3,286	470	207	677
Company's share of reserves of consolidated companies									
As of December 31, 2018	116	48	164	2,181	1,105	3,286	470	207	677
1) Revision of previous estimates	13	(1)	12	160	(53)	107	41	(4)	37
2) Improved recovery	1	0	1	1	1	2	2	1	3
3) Extensions and discoveries	2	45	47	21	954	975	5	207	212
4) Purchases/Sales of Petroleum in place	21	106	127	816	582	1,398	153	206	359
5) Production	(30)	(11)	(41)	(475)	(212)	(687)	(107)	(43)	(150)
Company's share of Reserves of equity companies ⁽³⁾	0	-	0	16	-	16	2	-	2
As of December 31, 2019	123	187	310	2,720	2,377	5,097	566	574	1,140

(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) LPG Included

(3) Included 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.

Proved properties include exploration wells, development wells, transportation pipeline, producing facilities and decommissioning costs. Unproved properties represent amounts associated with capitalized cost of projects which have not yet found proved reserves.

(Unit: Million US Dollar)	2019	2018
Proved properties	31,152	26,731
Unproved properties	<u>4,366</u>	<u>4,715</u>
Gross capitalized costs	35,518	31,446
Accumulated depreciation, depletion, amortization and allowance for impairment	<u>(22,277)</u>	<u>(20,218)</u>
Net capitalized costs	<u>13,241</u>	<u>11,228</u>

(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)	2019			2018		
	Domestic	Foreign	Total	Domestic	Foreign	Total
Acquisition of properties						
- Proved	60	2,580	2,640	1,314	-	1,314
- Unproved	-	22	22	-	26	26
Exploration costs	5	210	215	1	75	76
Development costs	<u>594</u>	<u>354</u>	<u>948</u>	<u>718</u>	<u>273</u>	<u>991</u>
Total	<u>659</u>	<u>3,166</u>	<u>3,825</u>	<u>2,033</u>	<u>374</u>	<u>2,407</u>

(D) Results of operations for producing activities

Results of operations from oil and gas producing activities for the year 2019 and 2018 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 write off expenses.

General 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)	2019			2018		
	Domestic	Foreign	Total	Domestic	Foreign	Total
Gross revenues						
Sales – Related parties	4,281	1,024	5,305	3,745	1,085	4,830
Sales – Third parties	276	891	1,167	304	465	769
Total sales	4,557	1,915	6,472	4,049	1,550	5,599
Expenses						
Operating expenses	486	582	1,068	436	497	933
Exploration expenses	2	127	129	2	43	45
General administrative expenses	43	94	137	35	76	111
Petroleum royalties and remuneration	528	19	547	470	-	470
Depreciation, depletion and amortization	1,511	497	2,008	1,371	459	1,830
Other (income) / expenses	<u>(59)</u>	<u>(37)</u>	<u>(96)</u>	<u>(14)</u>	<u>83</u>	<u>69</u>
Total expenses	2,511	1,282	3,793	2,300	1,158	3,458
Results before income taxes	2,046	633	2,679	1,749	392	2,141
Income tax expenses	<u>706</u>	<u>210</u>	<u>916</u>	<u>573</u>	<u>237</u>	<u>810</u>
Net results of operations	<u>1,340</u>	<u>423</u>	<u>1,763</u>	<u>1,176</u>	<u>155</u>	<u>1,331</u>

(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	
	2019	2018	2019	2018	2019	2018
Future cash inflows	17,902	16,164	20,025	6,759	37,927	22,923
Future production costs	(2,784)	(2,660)	(4,946)	(1,251)	(7,730)	(3,911)
Future development costs	(7,548)	(6,048)	(3,682)	(933)	(11,230)	(6,981)
Future income tax expenses	(2,174)	(2,288)	(3,186)	(945)	(5,360)	(3,233)
Future net cash flows	5,396	5,168	8,211	3,630	13,607	8,798
10% annual discount	(1,091)	(818)	(4,039)	(1,169)	(5,130)	(1,987)
Standardized measure of discounted future net cash flows (SMDCF) of consolidated companies	4,305	4,350	4,172	2,461	8,477	6,811
SMDCF of equity companies ³	37	-	-	-	37	-
Total SMDCF	<u>4,342</u>	<u>4,350</u>	<u>4,172</u>	<u>2,461</u>	<u>8,514</u>	<u>6,811</u>

Changes in Standardized Measure of Discounted Future Net Cash Flows Relating to Proved Oil and Gas Reserves

(Unit: Million US Dollar)	2019	2018
Present value at beginning of year of consolidated companies	6,811	5,399
Sales and transfers of oil and gas produced, net of production costs during period	(4,652)	(3,767)
Development costs incurred during the period	960	1,145
Net changes in prices and production costs	2,197	3,216
Net changes in development costs	(112)	(564)
Extensions, discoveries and improved recovery	4,414	1,412
Revisions of previous quantity estimates	415	579
Purchases / sales of petroleum in place	3,714	1,225
Accretions of discount	(3,143)	(1,045)
Net changes in income taxes	<u>(2,127)</u>	<u>(789)</u>
Present value at the year end of consolidated companies	8,477	6,811
Present value at the year end of equity company ¹	<u>37</u>	-
Total Present value at the year end	<u>8,514</u>	<u>6,811</u>

³ included investment in APICO Joint Venture project

(F) Other Information
Productive Oil/Condensate and Gas Wells

The numbers of productive wells at December 31, 2019 were as follows:

	<u>Oil/Condensate</u>	<u>Gas</u>
	<u>Gross</u>	<u>Gross</u>
Thailand	865	1,205
Foreign		
Southeast Asia	129	286
Others	9,315	-
Total	<u>10,309</u>	<u>1,491</u>

Drilling in Progress of Oil/Condensate and Gas Wells

The numbers of wells in progress at December 31, 2019 were as follows:

	<u>Number of Well</u>
<u>Exploratory</u>	
Thailand	-
Foreign	
Southeast Asia	1
Others	-
Total	<u>1</u>
<u>Development</u>	
Thailand	16
Foreign	
Southeast Asia	2
Others	1
Total	<u>19</u>

Net Oil/Condensate and Gas Wells Drilled Annually in 2019

	<u>Productive Well</u>	<u>Dry Well</u>
<u>Exploratory</u>		
Thailand	-	-
Foreign		
Southeast Asia	8	8
Others	1	1
Total	<u>9</u>	<u>9</u>
 <u>Development</u>		
Thailand	342	12
Foreign		
Southeast Asia	43	1
Others	-	-
Total	<u>385</u>	<u>13</u>

Quarterly Information in 2019 and 2018 for the consolidated financial statement are as follows:

Unit: US Dollar

<u>Year 2019</u>	<u>4thQ</u>	<u>3rdQ</u>	<u>2ndQ</u>	<u>1stQ</u>
Revenues				
Sales	1,754,900,631	1,494,389,633	1,469,499,654	1,327,626,240
Revenue from pipeline transportation	25,211,924	29,453,709	33,441,021	28,289,483
Other income				
Gain on foreign exchange	29,442,854	19,975,173	26,449,713	32,729,790
Interest income	13,597,516	12,741,830	32,807,784	27,087,691
Gain on financial derivatives	-	21,347,992	-	-
Other income	16,929,538	15,382,313	10,407,629	12,671,171
Total Revenues	1,840,082,463	1,593,290,650	1,572,605,801	1,428,404,375
Expenses				
Operating expenses	280,742,698	181,382,444	153,473,481	135,083,704
Exploration expenses	27,496,976	59,091,981	33,006,988	8,502,045
Administrative expenses	132,383,175	93,950,863	92,580,760	64,861,714
Petroleum royalties and remuneration	151,527,598	135,608,689	137,138,703	122,059,219
Depreciation, depletion and amortization	577,988,263	511,721,459	476,953,188	459,392,677
Other expenses				
Loss on financial derivatives	41,020,245	-	7,709,075	82,018,396
Finance costs	62,434,355	59,800,813	55,684,491	57,059,082
Total Expenses	1,273,593,310	1,041,556,249	956,546,686	928,976,837
Share of profit of associates and joint ventures	6,303,945	802,183	2,518,049	2,727,662
Profit before income taxes	572,793,098	552,536,584	618,577,164	502,155,200
Income taxes	(189,146,369)	(193,931,190)	(185,994,360)	(107,926,126)
Profit for the year	383,646,729	358,605,394	432,582,804	394,229,074
Basic earnings per share				
Continuing operations	0.09	0.09	0.10	0.10

Unit: US Dollar

<u>Year 2018</u>	<u>4thQ</u>	<u>3rdQ</u>	<u>2ndQ</u>	<u>1stQ</u>
Revenues				
Sales	1,411,017,765	1,337,321,462	1,293,593,282	1,160,877,348
Revenue from pipeline transportation	29,190,306	29,987,855	25,367,013	23,018,560
Other income				
Gain on foreign exchange	-	-	-	25,062,316
Interest income	22,703,516	19,802,410	20,873,464	19,973,276
Gain on financial derivatives	71,955,087	-	-	-
Other income	21,530,874	10,632,882	7,900,369	10,719,935
Total Revenues	1,556,397,548	1,397,744,609	1,347,734,128	1,239,651,435
Expenses				
Operating expenses	168,808,730	166,176,601	168,992,974	141,105,849
Exploration expenses	9,022,944	18,637,627	15,277,426	2,747,477
Administrative expenses	104,706,341	69,634,574	58,439,352	57,453,370
Petroleum royalties and remuneration	133,659,700	121,414,377	110,641,320	103,947,632
Depreciation, depletion and amortization	484,519,932	496,344,211	459,708,136	407,938,260
Other expenses				
Loss on foreign exchange	7,386,463	6,059,895	30,248,049	-
Loss on financial derivatives	-	6,808,271	7,553,864	43,626,319
Other expenses	20,745,077	37,022,924	-	-
Finance costs	66,885,106	57,421,070	57,212,601	57,046,118
Total Expenses	995,734,293	979,519,550	908,073,722	813,865,025
Share of profit of associates and joint ventures	1,699,603	2,285,467	1,848,770	2,098,428
Profit (loss) before income taxes	562,362,858	420,510,526	441,509,176	427,884,838
Income taxes	(294,011,392)	(105,156,779)	(328,480,261)	(5,009,755)
Profit for the year	268,351,466	315,353,747	113,028,915	422,875,083
Basic earnings per share				
Continuing operations	0.07	0.07	0.03	0.10

Petroleum Sales Volume and Average Unit Prices

	2019	2018
Net sales of petroleum (BOED)	350,651	305,522
Average petroleum unit prices		
Average unit prices of crude oil and condensate (USD/BBL)	61.18	67.40
Average unit prices of natural gas (USD/MMBTU)	6.92	6.42
Average unit prices of petroleum (USD/BOE)	47.24	46.66
Lifting cost (USD/BOE)	4.31	4.33