

Sustainability
OUR ACHIEVEMENT,
OUR INTENT



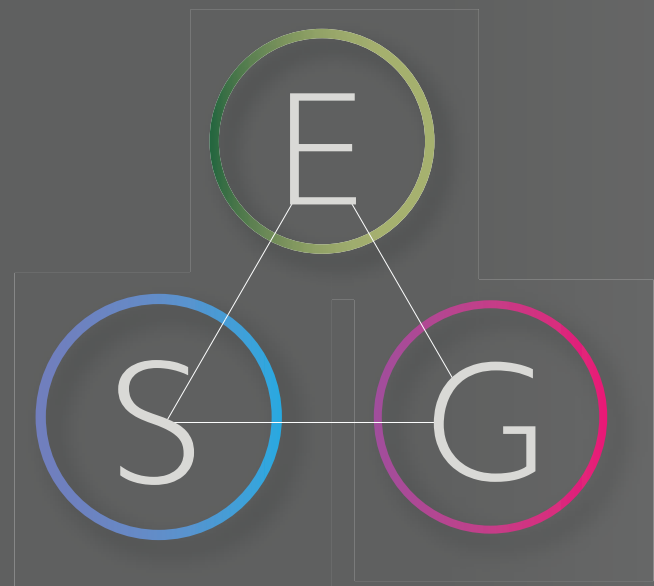
- ★ DJSI Industry Leader in Oil & Gas Refining & Marketing ★
- ★ Stock Exchange of Thailand Sustainability Awards of Honor ★



CONTENT

| | | | |
|-----|---|-----|--|
| 008 | Financial Highlights | 096 | Organizational Structure |
| 010 | Message from the Board of Directors | 098 | Executives |
| 014 | Audit Committee Report | 102 | Assets and Shareholders Information and Management Structure |
| 017 | Corporate Governance Committee Report | 126 | Risk Factors and Corporate Risk Management |
| 020 | Nomination and Remuneration Committee Report | 134 | Internal Controls |
| 022 | Risk Management Committee Report | 139 | Corporate Governance Report |
| 024 | Thaioil and Subsidiaries' Vision, Mission, and Strategies | 166 | Thaioil and Subsidiaries' Social Responsibility |
| 026 | Summary of Business Achievements in 2019 | 168 | Corporate Information |
| 032 | Milestones of 2019 | 178 | Thaioil and Subsidiaries' Business Structure |
| 039 | Market Review 2019 and Market Outlook | 180 | Revenue Structure |
| 052 | Production Process, Process Development, Quality, Security, Safety & Occupational Health and Environmental Management | 182 | Management's Discussion and Analysis of Financial Position and Operating Results |
| 068 | Future Projects | 188 | Connected Transactions |
| 072 | Human Resources and Organization Development | 195 | Board of Directors' Responsibility for Financial Reporting |
| 076 | Board of Directors | 196 | Financial Statements |

Investors can find financial and connected transaction past information in the Company's website www.thaioilgroup.com through Investor Relations channel on "Financial Information"



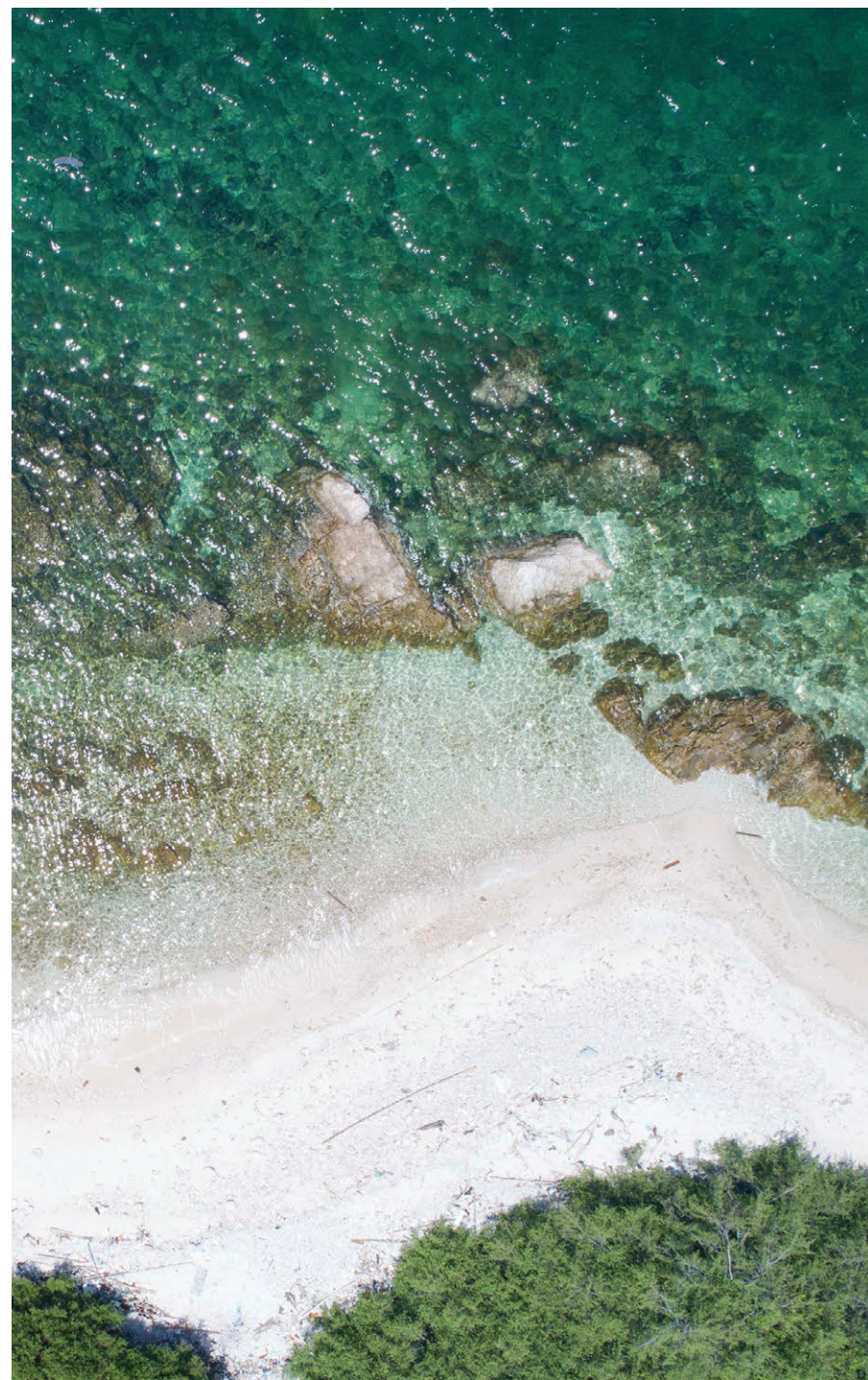
Sustainability: Our Achievement, Our Intent

Thaioil's path to sustainability originates from business development perspective and goals, covering environmental, social and governance aspects (ESG). Enriched with more than 58 years of experience on stabilizing energy security for Thailand, Thaioil is equipped with experiences, expertise and readiness to respond to the constant change of directions and trends in the country. This is secured by driving the organization for the initiation and development of environmentally-friendly products capability enhancement, innovation elevation and technology development. This is executed in parallel with passing on the sustainability values to stakeholders to ensure good quality of life for the society.



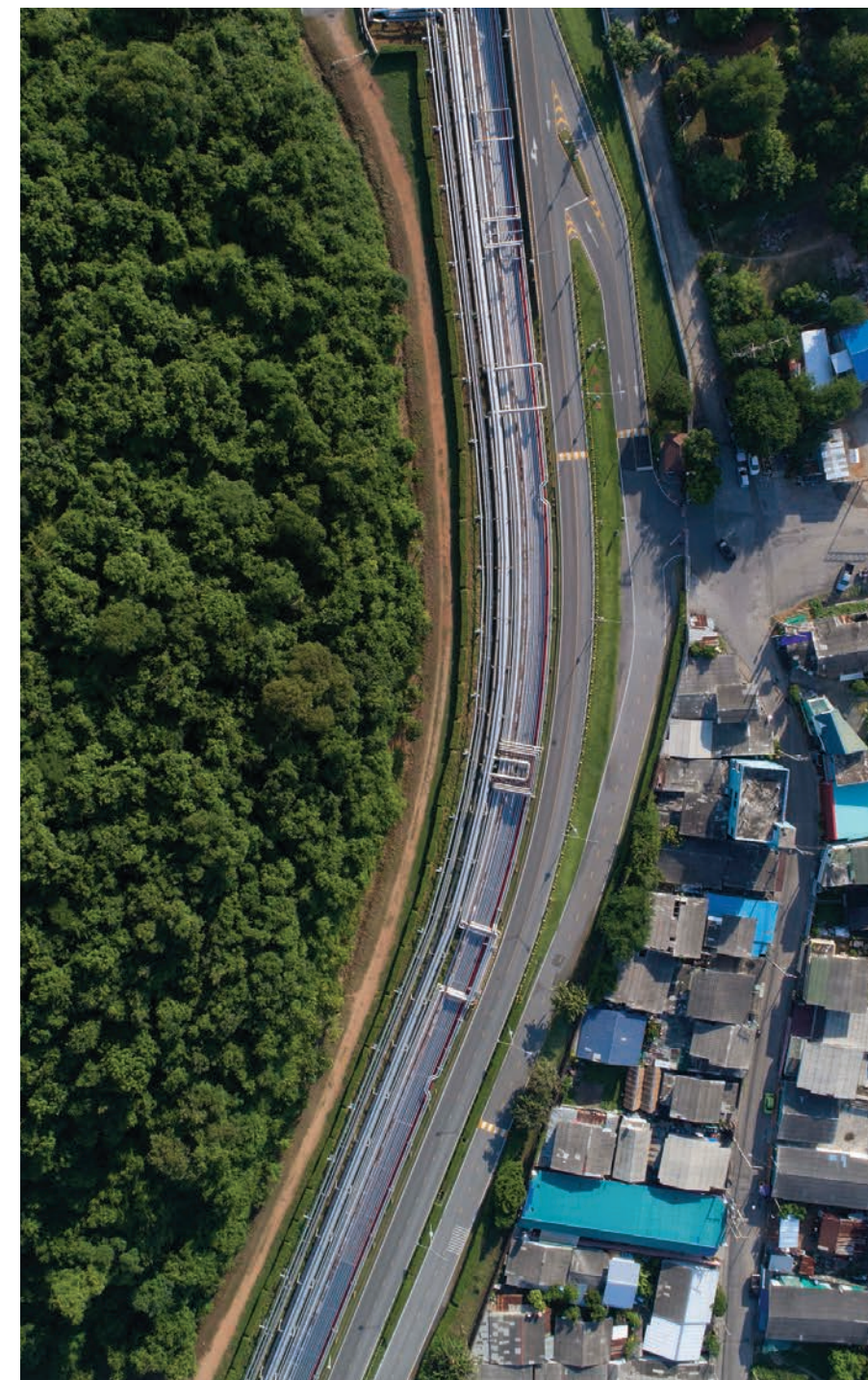
Environmental

Thaioil prioritizes the mitigation of impacts on environment throughout the supply chain; from crude sourcing, process supervising, applying advanced technology, to delivering products to customers, as well as emphasizing on developing environmentally-friendly products.



Social

Thaioil is determined to conduct business under human rights principles, the development of people's potential, and the contribution back to communities and societies surrounding the refinery. This is executed through activities and projects whose goal is to improve the environment, and elevate the quality of life of people in the community and society, which includes education, public health, and the enhancement and conservation of local culture, tradition, and identify.



Governance

Thaioil constantly conducts business following good corporate governance principles and focuses on equitable, fair, transparent and auditable treatment of stakeholders. The Company also commands the risk management with an international-standard efficient operating structure to minimize impacts on the organization in all aspects.





Environmental

Operational Eco-Efficiency

Enhance the efficiency of resources utilization, and mitigate impacts on the environment

Circular Economy

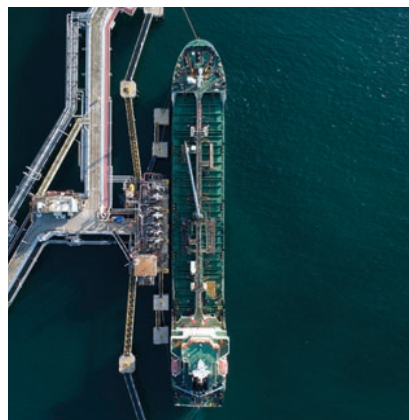
Optimize the resource utilization in all business process

Green Product

Increase the proportion of revenue streamed from innovations and environmentally-friendly products, such as low carbon products and biodegradable products



Operational
Eco-Efficiency



Green
Product



Circular
Economy





Social

Corporate Citizenship

Conduct business with social and environmental responsibilities, in parallel with elevating quality of life and developing potentials of people in communities and societies to grow together

Occupational Health and Safety

Enhance the working environment and production process controls to ensure the safety of operators and nearby communities

Human Capital Development

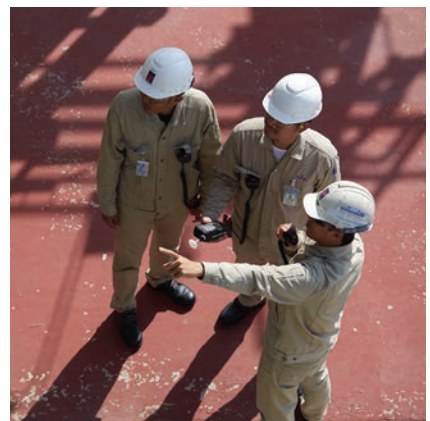
Develop potentials and enhance quality of life of staff-the vital force driving the organization to its goals



Corporate Citizenship



Human Capital Development



Occupational Health and Safety



Governance

Risk Management

Assess analyze and define risk mitigation measures with prudence and conciseness to prevent long-term impacts on the organization and stakeholders

Code of Conduct

Adhere to and comply with business practices which are transparent and fare to all groups of stakeholders

Anti-corruption

Develop a system and cultivate culture for business transparency, and free from corruption and bribery in all company activities.



Risk
Management



Anti-
corruption



Code of
Conduct



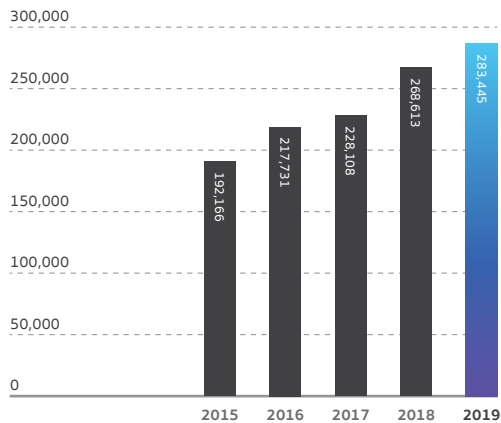
FINANCIAL HIGHLIGHTS



TOTAL ASSETS

Million Baht

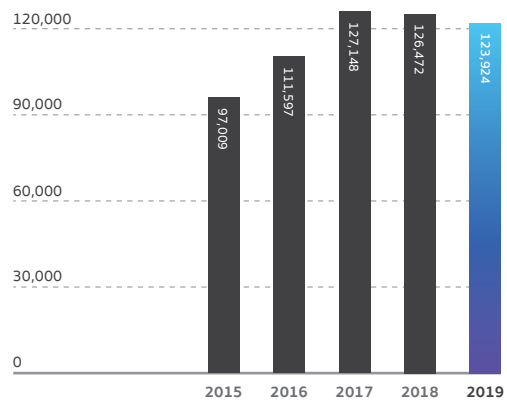
283,445



TOTAL EQUITY

Million Baht

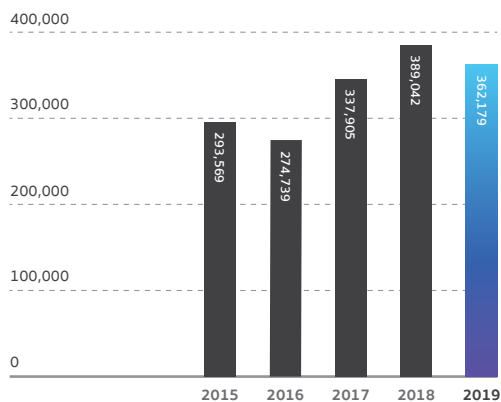
123,924



SALES REVENUE

Million Baht

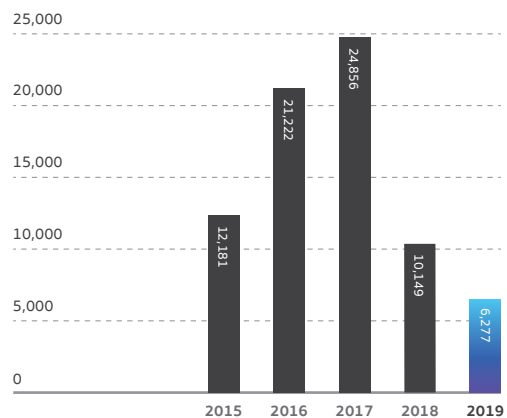
362,179



NET PROFIT

Million Baht

6,277



| | | 2019 | 2018 | 2017 | 2016 | 2015 |
|---------------------------------|--------------|---------------------|---------|---------|---------|---------|
| Operating Results | | | | | | |
| Sales Revenue ⁽¹⁾ | Million Baht | 362,179 | 389,042 | 337,905 | 274,739 | 293,569 |
| EBITDA | " | 13,833 | 20,239 | 36,925 | 32,675 | 25,492 |
| Net Profit/(Loss) | " | 6,277 | 10,149 | 24,856 | 21,222 | 12,181 |
| Basic Earnings/(Loss) per Share | Baht | 3.08 | 4.97 | 12.18 | 10.40 | 5.97 |
| Financial Position | | | | | | |
| Total Assets | Million Baht | 283,445 | 268,613 | 228,108 | 217,731 | 192,166 |
| Total Liabilities | " | 159,521 | 142,141 | 100,960 | 106,134 | 95,157 |
| Total Equity | " | 123,924 | 126,472 | 127,148 | 111,597 | 97,009 |
| Financial Ratios | | | | | | |
| Interest Coverage Ratio | Times | 4.2 | 5.1 | 11.2 | 9.4 | 7.4 |
| Current Ratio | " | 3.5 | 4.3 | 3.8 | 3.4 | 5.0 |
| Net Debt to Equity Ratio | " | 0.3 | - | - | 0.1 | 0.2 |
| Return on Equity | % | 5.2 | 8.3 | 21.7 | 21.3 | 13.9 |
| Return on Assets | " | 2.4 | 4.2 | 11.4 | 10.5 | 6.5 |
| Stock Data | | | | | | |
| Annual Average | | | | | | |
| Daily Closing Stock Price | Baht/Share | 68.26 | 86.88 | 84.23 | 66.70 | 53.52 |
| Market Capitalization | Million Baht | 139,252 | 177,238 | 171,832 | 136,070 | 109,182 |
| Dividend Payment | Baht/Share | 1.50 ⁽²⁾ | 2.65 | 5.25 | 4.50 | 2.70 |
| Dividend Yield ⁽³⁾ | Percent | 2.2 | 3.1 | 6.2 | 6.7 | 5.0 |
| Book Value | Baht/Share | 58.81 | 59.66 | 59.91 | 52.38 | 45.28 |

Note:
⁽¹⁾ The comparative figures have been adjusted due to reclassification in 2019 and 2018

⁽²⁾ Including the interim dividend for 2019 half-year results at the rate of 1.00 Baht per share paid on September 27, 2019, and the remaining dividend of 0.50 Baht per share is to be proposed to the 2020 Annual General Meeting of Shareholders for approval

⁽³⁾ Calculated from the annual average of the daily closing stock price.



MESSAGE FROM THE BOARD OF DIRECTORS



Professor Dr. Thosaporn Sirisumphand
Chairman of the Board

Mr. Wirat Uanarumit
Chief Executive Officer and President

Dear Shareholders

The year 2019 was filled with several adverse business factors, whether external ones resulting from doldrums in the world economy and industrial situation or internal ones resulting from the major turnaround of our refinery. These posed grave obstacles and challenges to Thairoil and Subsidiaries. Nevertheless, with the commitment of employees, executives, and the Board of Director (the Board) jointly setting of measures to cope with such volatilities and successfully implementing them, we have achieved impressive outcomes, given such adverse circumstances affecting other organizations across the spectrum of the industry. For the year, Thairoil and Subsidiaries posted a net profit of THB 6.277 billion.

Challenges and Proactive Measures

The stagnant global economy due to the US-China trade war sends repercussions on petroleum and petrochemical demand; and with new capacities continuously coming to the market, the Gross Refining Margin (GRM) was inevitably pressured and significantly decreased. Internally, Thairoil underwent a month of major turnaround to carry out maintenance at several distillation units, resulting in the average utilization rate being lower than normal. To ease the impacts of such factors, Thairoil and Subsidiaries devised proactive measures and plans to focus on maximum efficiency in all business processes to increase profit and curb expenses. These measures contributed more than THB 5 billion before tax, including the selection of low-price crude oil from new sources, entering into hedging contract, and replacement of catalysts at Hydrocracking Unit-2, resulting in more high-value products. This approach is considered one of Thairoil's robust corporate culture that focuses on operational excellence, is constantly committed by the Company's personnel, and significantly and consistently increases the marginal benefit for the Company.

Implementing proactive approach is considered one of Thairoil's robust corporate culture that focuses on operational excellence, is constantly committed by the Company's personnel, and significantly and consistently increases the marginal benefit for the Company.

With a mission to enrich stakeholders' well-being and deliver sustainable returns through a robust business structure under excellent management-focusing on a proper balance of environmental, social, and governance

Update on Clean Fuel Project (CFP) and Other Investment

The Clean Fuel Project (CFP), whose investment was supported and approved by the shareholders, represents Thailoil's vital strategic project that enhances our competitiveness. This year, the CFP went as planned and within the budget; an agreement along with other related agreements were signed with Energy Recovery Unit Co., Ltd. (a subsidiary of Global Power Synergy Plc (GSPC)) to sell the Energy Recovery Unit (ERU) which is a part of CFP, as previously approved by the shareholders. This enabled Thailoil to lower its CFP investment cost by about USD 757 million. As for project implementation, Thailoil notched good progress, including process design, which is completed and on process of engineering designs; procurement of equipment and machinery, which requires long lead time; and the handover of the construction site to project contractors to begin civil work, including site preparation and piling work, etc.

Thailoil has completed two other investment projects to improve and develop public utilities systems and refining support systems: namely, TOP Crude Oil Tank and IDEA Project for Basic Infrastructure on Refining Compound. Other projects registered good progress, with around 90% progress on the Jetty Expansion Project and Thailoil

Sriracha Buildings Project with the expected completion date by Q1/2020. Once these projects are completed, Thailoil and Subsidiaries would command higher business competitiveness. Finally, this year the Board endorsed the investment on Hydrodesulphurization Unit Improvement Project, which would enable Thailoil to produce all Euro 5 standard fuels to support the public policy and to ease environmental impacts.

Execution under Strategic Plans

Thailoil and Subsidiaries are relentlessly committed to developing and growing our businesses, as laid down in strategic plans, with a goal to invest in countries boasting high business growth. This year TOP Solvent Co., Ltd., acquired shares in PT. Tirta Surya Raya, which engages in the distribution of solvents and chemicals in Indonesia. Moreover, we established cooperation with business partners and companies in PTT Group to jointly investigate business growth opportunities, to invest in the Corporate Venture Capital Project, and to commercialize R&D innovations.

Management for Sustainable Growth

With a mission to enrich stakeholders' well-being and deliver sustainable returns through a robust business structure under excellent management-focusing on a

proper balance of environmental, social, and governance (ESG) aspects-we upgraded our management practices in assorted areas, including integration of Governance, Risk, and Compliance (GRC); regularly staged activities and social projects throughout the year for improved community relations and sustainable co-existence; and implemented the environmental master plan under the Circular Economy to strive for cost-effective resource consumption and minimal waste disposal. This year, Thaioil and Subsidiaries ran several projects to increase energy efficiency, which together enabled us to lower direct greenhouse gas emissions by 84,265 tons of carbon dioxide equivalent per year. In addition, TOP SPP Co., Ltd.'s combined-cycle cogeneration plant earned certification of the Thailand Voluntary Emission Reduction (T-VER) Project for reducing greenhouse gas emissions along with some 300,000 tons of carbon dioxide equivalent per year of carbon credit.

From Commitment to Confidence and Achievement

Our remarkable success in the offer of USD 565 million worth of debentures late this year along with their overwhelming interest amounting to 6.5 times of actual subscription, illustrated investors' positive views and

confidence in Thaioil and Subsidiaries. By the same time, our certification and acclaim in various areas from national and international reputable entities and institutes speak volumes of our success in earnest and effective policy and strategic plan implementation. This is reflected, for instance, in the certification of Dow Jones Sustainability Indices (DJSI) for the seventh consecutive year, with the highest score (Industry Leader) in the Oil & Gas Refining & Marketing Industry Group. Furthermore, Thaioil was named a recipient of the NACC Integrity Awards of 2018 by the Office of the National Anti-Corruption Commission, and won the Sustainability Awards of Honor from Stock Exchange of Thailand for the third consecutive year.

The Board, the executives, and all employees wish to express our heartfelt appreciation to the shareholders for excellent support to our businesses over the years. In return, we remain committed and determined to do our best to lay a solid foundation for the growth of Thaioil and Subsidiaries with good governance for the best interests of shareholders and stakeholders in a fair manner, while balanceably create energy and value for Thai society.

AUDIT COMMITTEE REPORT

Mr. Kanit Si

Chairman of the Audit Committee



Dear Shareholders

Appointed by the Board of Directors (the Board), the current Audit Committee consists of three independent directors, chaired by Mr. Kanit Si, with Associate Professor Dr. Pasu Decharin and Mr. Prapaisith Tankeyura serving as members. All members command expertise and experience in finance and accounting, business administration, organizational management, corporate governance, law, economics, proficiency in energy affairs, petroleum, petrochemical, and engineering as well as Information Technology (IT) and digital technology. The Audit Committee's composition and the members' qualifications are considered suitable for reviewing financial statements' credibility against the requirements of Thailand Securities and Exchange Commission (SEC) and Stock Exchange of Thailand (SET).

The Committee independently executed Board-assigned and charter duties, which conform to the requirements and best practices for audit committees according to SEC and SET. This year, the Committee held eight

meetings, including consultation with the executives, the internal auditor, and the external auditor.

In addition, the Committee held one non-executive meeting with the new external auditor appointed by the shareholders in the Annual General Meeting of Shareholders (AGM) in April 2019 for unrestricted consultation on the external auditor's work, audit plans, the internal control system related to financial statements audit, cooperation with the executives, and its collaboration with the Audit Committee and Corporate Internal Audit Department.

The highlights of this year performance are as follows:

1. Financial Statements:

Collaborating with the external auditor and relevant members of the executives, the Committee reviewed the quarterly and annual financial statements for Thailoil and the consolidated financial statements. It also examined information disclosure and the external auditor's focus on Key Audit Matters (KAMs) indicated in the auditors'

report. To this end, the Committee inquired and reviewed the credibility of estimated figures, the management's assumptions requiring discretion, display of transactions, and the impacts of financial reporting standard changes. This is to ensure that the financial statements preparation complies with legal requirements and financial reporting standards and that the financial statements are accurate, credible, and useful for related stakeholders. The auditor has performed the auditing work and provided unqualified opinions.

2. Connected Transactions:

In reviewing connected transactions or those posing potential conflicts of interest with that of Thailoil and Subsidiaries under SET's and SEC's announcements, the Committee concluded that Thailoil and Subsidiaries had observed regular business practices, fairness and sensibility in the best interests of Thailoil and its shareholders. Such transactions had secured the approval of the executives or the Board before their execution and were promptly disclosed to SET.

3. Review of Compliance with Laws, Corporate Governance, Risk Management, and Internal Control:

The Committee valued the management for systematic corporate governance, transparent transaction, as well as legal and related regulations compliance. Cooperating with the executives and external auditors, the Committee reviewed the efficiency and effectiveness of corporate governance, risk management, and internal control processes. It also examined the report of the risk management outcomes provided by risk management and internal control units; the report on legal and related regulations compliance by Regulatory Compliance Department; and the report on internal audit outcomes provided

by Corporate Internal Audit Department. The Committee encouraged Thailoil to monitor the draft legislation under deliberation that could impact the Company so as to be fully prepared before its promulgation; focusing on proactive participation in hearing relevant discussions and expressing views before the promulgation. The Committee also encouraged the review and communication of complaint-handling and whistleblowing measures to ensure their clarity and suitability. The Committee also emphasized the cultivation of the awareness of internal control, and prioritized the creation of the control self-assessment forms before developing such forms to be used among affiliates. The Committee prioritized the Three Lines of Defense and the Integrated Governance, Risk and Compliance (GRC) to ensure the integration of proactive prevention, covering Procure to Pay, IT General Control, Order to Cash, and Payroll processes. The SAP GRC system was used to screen and continually monitor irregularities and prevent fraud. The Audit Committee also endorsed the outcomes of system adequacy, assessment against SEC's requirements, stating that Thailoil indeed commanded a suitable and adequate internal control system. Finally, it reviewed CAC self-assessment outcomes for anti-corruption under the CG Code for Listed Companies, which illustrated Thailoil's firm commitment to anti-corruption.

4. Internal Audit:

Besides the review of strategic plans, annual and long-term audit plans, executions in accordance with plans, audit outcomes, and follow-ups as well as improvements of significant issues, the Committee pushed for the development and upgrading of Thailoil's internal audit through audit assurance, advice, and

proactive work. This was, in particular, applied with the Clean Fuel Project (CFP) which is highly critical for the Company's business, the Committee focused on internal audit's proactive work with an emphasis on the hiring and procurement process by providing the working team comments and advices which can be immediately implemented to correct defects. Furthermore, the Committee prioritizes safety during CFP construction, especially in the years 2020-2021 which will be conducted the current process site, employees and contractors must strictly comply with work rules, undergo due training, and be aware of safety requirements at all times. The internal audit must work closely with the CFP team to ensure constant manpower preparedness and continuous staff competence for auditing efficiency and effectiveness. The Committee also advocated the applying of digitalization to the audit work leading to the audit automation; steered internal audit's quality assessment; and the acquirement of auditor certification for personnel to enhance professionalism that keeps abreast of professional standard shifts. Finally, the Committee annually appraised the performance of Vice President Corporate Internal Audit.

5. Appointment of the External Auditor for 2020 and Approval for Audit Fee:

In selecting the external auditor, the Committee considered performance records, experience, audit fees, and compliance with SEC's announcements. The Committee resolved to nominate PricewaterhouseCoopers ABAS Ltd. (PwC) for the Board's endorsement to propose in 2020 AGM for shareholders' approval.

In conclusion, this year the Audit Committee executed its charter duties and responsibilities with diverse expertise, prudence, and freedom while providing creative views

and advices. It concluded Thailoil and Subsidiaries value efficient and effective business conduct, prepare credible and material financial statements aligning with financial reporting standards, complete an adequate disclosure of connected transactions with potential conflicts of interest, and command a sound corporate governance, a sufficient risk management, and a suitable and adequate internal control process. Thailoil and Subsidiaries fully comply with applicable laws and regulations. Singling out CFP for its massive value and business importance, the Committee stressed righteousness and transparency as well as avoidance of delays or budget repercussion. CFP safety remained at the forefront; related employees and contractors must undergo training, be aware of safety requirements and observe safety procedures as professionals do, to keep the project going in an efficient manner and fulfill Thailoil's objective. Finally, the Board's view of the Audit Committee's performance was that it was regarded as a Level 5 (Exemplary).

The Audit Committee noted that this year it received excellent cooperation from the Board of Directors, the executives, the external auditor, and all relevant units.

February 14, 2020

On behalf of the Audit Committee



(Mr. Kanit Si)

Chairman of the Audit Committee
Thai Oil Public Company Limited

CORPORATE GOVERNANCE COMMITTEE REPORT

Police General Aek Angsananont

Chairman of the Corporate Governance Committee



Dear Shareholders

Good corporate governance (CG) and the business code of conduct (CoC) principles and practices represent an integral part of the core mission to which Thailoil and Subsidiaries have always been strictly committed. The Board of Directors (the Board) has appointed the Corporate Governance Committee (CGC or the Committee), currently consisting of three directors, chaired by Police General Aek Angsananont, along with Mr. Yongyut Jantararotai and General Kukiatt Srinaka as members, to take charge of policy formulation, supervision, monitoring, and promotion of CG and CoC to form a robust corporate culture.

This year, the Committee held six meetings with full attendance as planned, carried out all their duties as indicated in its Charter and assigned by the Board, and regularly reported the performance outcomes to the Board. In 2019, the Committee reviewed and approved important activities and work plans on CG as summarized below.

1. Development of CG Guidelines

The Committee deemed it appropriate to review its criteria of director's number of directorship in companies listed in Stock Exchange of Thailand (SET). Previously, Thailoil specified a limit of five listed companies in SET, where each director can serve. However, they can now serve in only three listed companies, in order to assure that the Board efficiently devote sufficient time to their duties. The Committee formalized a policy for directors and executives to report the intention to purchase or sell Thailoil's securities in advance of the actual transaction. This practice constitutes the supervision on the use of undisclosed insight in order to ensure fairness to other shareholders, in accordance to the good CG principles. Currently, such criteria and policy are effective and described in the Thailoil's CG and CoC Manual. In addition, the Committee approved for an external consulting company to evaluate 2019 performance of the Board under the good CG principles, recommending the performance evaluation by third party every 2-3 years.

2. Supervision, Encouragement, and Monitoring of Compliance with CG Policy, Anti-Corruption Policy, and Business Code Of Conduct

The Committee approves and recommends essential plans directly relating to CG, such as the Board's performance evaluation, the Annual General Meeting of Shareholders (AGM) plan, and the accommodation for shareholders to propose AGM agenda and nominate candidate for the Company's director.

In addition, the Committee advised and endorsed Thailoil's annual development plan of CG, CoC, anti-corruption, and treatment of stakeholders, and monitored their implementation and compliance against proposed plans, covering communication, cultivating integrity as corporate culture, and fair treatment of all stakeholders. Examples of key activities carried out in 2019 included the creation and distribution of an "Integrity the Series" short video to promote knowledge of ethical practices within the organization; endorsement of the Private Sector Collective Action Coalition against Corruption (CAC) re-certification assessment, facilitation for customers by issuing electronic bank guarantees through blockchain; and the implementation of digital technology to improve procurement system by receiving and sending purchase orders online.

3. Encouragement of Corporate Social Responsibility (CSR) and Sustainable Development (SD)

The Committee endorsed CSR development plan, which covered refinery community affairs and social development at the national level. In addition to the ongoing and more intensifying CSR activities organized in the communities surrounding the refinery inclusive of education, public health, religion, culture and

tradition, and the environment, in 2019, Thailoil presented the "Thailoil Building" to Laem Chabang Hospital as a center of medical treatment for accident and emergency patients. Moreover, Thailoil has installed a solar power generation system (solar farm) for Ban Huai Tong Border Patrol Police Learning Center in Nopphitam District, Nakhon Si Thammarat; Thanyarak Mae Hong Son Hospital in Mae Hong Son; and Koh Sichang Hospital in Chonburi, to solve and stabilize power system for medical care and reduce the electricity cost. Moreover, collaborating with Sarn Palung Social Enterprise Co., Ltd., the Café Amazon for Chance was inaugurated in Laem Chabang Hospital's area, where the hearing impaired of Sriracha District are hired as baristas in the shop.

With reference to sustainable development, the Committee endorsed a strategic plan and sustainability indices for both the short-term (2023) and long-term (2028). The plans cover the environmental, social and governance aspect, and provide guidelines on sustainable operation for Thailoil and Subsidiaries. The sustainability performance on material issues was monitored to ensure alignment with 2019 plans and goals.

Due to the strong determination to demonstrate standards of CG, corporate social responsibility, and sustainability management, Thailoil is widely accepted at national and international levels. The Company has been selected as a Dow Jones Sustainability Indices (DJSI) member for the seventh consecutive year and achieved the top scores (Industry Leader) among the organizations listed in Oil & Gas Refining & Marketing Industry Group at the global level. In addition, Thailoil received numerous awards and honors, including the NACC Integrity Awards from the Office of the National

Anti-Corruption Commission; the 2019 Corporate Governance Assessment of Thai Listed Companies (CGR) at an “excellent” level (90-100 points), for the 11th consecutive years; and Sustainability Awards of Honor in the field of Sustainability Excellence of SET Award 2019 for the third consecutive year; the top award of which was given to companies with excellent business sustainability for three or more years consecutively.

These achievements have demonstrated high CG standards together with utmost corporate social responsibility and sustainability management by Thailoil and Subsidiaries and their executives and employees. Therefore, the Committee is fully confident that Thailoil and Subsidiaries will achieve sustainable growth and earn conviction, enabling us to generate value for stakeholders and garner international acceptance.

January 17, 2020

On behalf of the Corporate Governance Committee



(Police General Aek Angsanonant)

Chairman of the Corporate Governance Committee

Thai Oil Public Company Limited

NOMINATION AND REMUNERATION COMMITTEE REPORT

Air Chief Marshal Suttipong Inseeyong

Chairman of the Nomination and
Remuneration Committee



Dear Shareholders

The Board of Directors (the Board) appointed the Nomination and Remuneration Committee (NRC or the Committee), which consists of at least three directors, the majority of whom must be independent directors, to seek for qualified people under Thail's process and criteria for nomination as directors and Thail's Chief Executive Officer and President. The Committee also selects directors to serve in Board-Committees and considers remuneration types and criteria for directors, before proposing for the Board's endorsement and later for the approval of the shareholders, as required by law.

The current NRC consists of three directors: Air Chief Marshal Suttipong Inseeyong (Independent Director), serving as Chairman with Associate Professor Dr. Pasu Decharin (Independent Director) and Mr. Auttapol Rerkpiboon (Director) serving as members.

This year, the Committee has fully executed all its charter duties, with five meetings fully attended by all incumbent members (meeting attendances shown on page 112).

Below are the highlights of NRC's execution this year:

1. Reviewed the overall Skill Matrix of the Board to embrace and align with corporate business plans, strategies, and global trends;
2. Reviewed 2019 director's remuneration structure by duly adjusting monthly retainer fees and per-attendance fee, raising the proportion of per-attendance fee while lowering that of monthly retainer fees so as to reflect more with the accountability for the meeting participation. This adjustment aligned with and followed the practices of other listed companies in the same industries. Moreover, the NRC changed the remuneration type for Board-Committees from monthly retainer fee to per-attendance fee. The per-attendance fee is now paid to the directors and Board-Committee members who attend the meetings only. These adjusted structure and compensation rates were approved in the 2019 Annual General Meeting of Shareholders (AGM);

3. Reviewed the approaches and qualifications required for directors nomination, emphasizing on the practice not limiting and restricting to differences in gender, race, ethnicity, country of origins, or nationality, which agrees with international corporate governance;
4. Sought and nominated directors strictly under the process and criteria stated in the Corporate Governance and Code of Conduct Manual for the Board's approval or endorsement before proposing for an approval of shareholders in AGM as required by law. The Committee added to its consideration the Directors' Pool of the State Enterprise Policy Office and Institute of Directors' Chartered Director (IOD Charter). The NRC also reviewed individual and overall qualification components of the Board of Directors to suit Thail's size, nature, complexity, and diversity of businesses, embracing education, expertise, skills and proficiency, experience, and specialized competencies related to Thail's businesses as well as their independency as prescribed by related law and Thail's requirements;
5. Sought and nominated directors for four Board-Committees, namely the Audit Committee, the Nomination and Remuneration Committee, the Corporate Governance Committee, and the Risk Management Committee, and tabled these lists to the Board of Directors for appointment to fill the vacancies upon Director's resignation or term completion;
6. Sought and nominated the Chief Executive Officer and President for this year's vacancy;
7. Assessed the performance of the Chief Executive Officer and President and tabled the proposed annual salary adjustment for the Board of Directors' approval;
8. Provided opportunity for minor shareholders to propose agenda and nominate directors at least three months ahead of the 2020 AGM through Thail's website.

January 9, 2020

On behalf of the Nomination and Remuneration Committee

(Air Chief Marshal Suttipong Inseepong)

Chairman of the Nomination and Remuneration Committee

Thai Oil Public Company Limited

RISK MANAGEMENT COMMITTEE REPORT

Mr. Auttapol Rerkpiboon

Chairman of the Risk Management Committee



Dear Shareholders

The Board of Directors (the Board) appointed the Risk Management Committee (RMC or the Committee) to support directors in managing and supervising corporate risks to achieve business goals, and to enhance confidence on and credibility of Thailoil among investors and stakeholders. The current Committee consists of the knowledgeable, competent, and experienced directors with understanding in the business as follows:

1. Mr. Auttapol Rerkpiboon Chairman of the
Risk Management Committee
2. Ms. Chularat Suteethorn Member of the
Risk Management Committee
3. Ms. Phannalin Member of the
Mahawongtikul Risk Management Committee
4. Mr. Wirat Uanarumit Member of the
Risk Management Committee

Performance Outcomes of 2019

The RMC defined and reviewed corporate risk management framework, policy, and processes, as indicated in the Risk Management Committee Charter, as well as efficiently provided recommendations for proper risk management approaches to ensure their accordance with strategic directions, operations, and business plans. The Committee also consistently and effectively supported and improved risk management practices throughout the Company, following international standards, to forge corporate culture. This year, the RMC held six meetings with the following highlights:

1. Reviewed the risk management policy and endorsed risk appetite, risk profile, mitigation plans, Key Risk Indicators (KRIs), and the corporate risk management plan;
2. Endorsed the oil hedging framework and target prices, before tabling for the Board's approval;

3. Endorsed risk management plans for the following key projects, before tabling for the Board's approval:

3.1 Risk management plan for finding the investors in the Energy Recovery Unit (ERU);

3.2 Risk management plan for purchasing newly-issued ordinary shares in Global Power Synergy Plc (GPSC);

3.3 Risk management plan for the issuance and offering of debentures through Thailoil Treasury Center Co., Ltd. (TTC);

3.4 Risk management plan for oil production under Euro 5 standard;

4. Endorsed the risk management framework of exchange rate for Clean Fuel Project (CFP);

5. Monitored and provided advices on the corporate risk management outcomes for Q1-Q4/2019;

6. Monitored and supervised on the oil hedging outcomes for Q4/2018 and Q1-Q3/2019;

7. Monitored the risk management progress and provided risk management recommendations on the CFP, Thailoil Sriracha Buildings Project, Jetty Expansion Project, Site Preparation for the construction of CFP's ERU project, and IDEA Project for Basic Infrastructure on Refining Compound.

8. Acknowledged the RMC's performance for 2019

The Risk Management Committee concluded that this year, Thailoil has developed an extensive corporate risk management system to embrace all aspects of risks and commanded continual risk management practices to cope with prevailing circumstances. The RMC meetings were regularly arranged to review key and urgent risks, rendering Thailoil and Subsidiaries' risk management effectiveness. Thailoil indeed effectively and suitably managed key corporate risks which were controlled within indicated risk appetite.

November 18, 2019

On Behalf of the Risk Management Committee



(Mr. Auttapol Rerkpiboon)

Chairman of the Risk Management Committee
Thai Oil Public Company Limited

THAIOIL AND SUBSIDIARIES' VISION, MISSION, AND STRATEGIES

For over 58 years of excellence in the energy business, Thaioil and Subsidiaries have determinedly refined knowledge and long-accrued experience to remain as an organization steep in potential for production, marketing, and management in the energy industry and in pursuit of proudly becoming a centenary entity.

This year Thaioil and Subsidiaries continued to focus on its **vision** of **Empowering Human Life through Sustainable Energy and Chemicals**, aiming to promote sustainable corporate growth, achieve top-quartile investment returns, lower earnings volatility through business diversification with due consideration for all stakeholders' interests and with governance-based business conduct to ensure the sustainability of the economy, society and the environment. They are armed with a **mission** to **enrich stakeholders' well-being and deliver sustainable returns built upon innovation, technology and resilient portfolio, with top-class management and accountable corporate governance.**



To achieve the Vision and Mission in becoming a world-class refinery with an integrated and competitive petrochemical business, Thaioil and Subsidiaries set goals to enhance operating efficiency and sustainable growth through three key strategies as follows:

01

Strengthen the Core

with a focus on two energy businesses Thaioil and Subsidiaries are expert, consisting of:

Refinery business: to enhance its strength in becoming a leading regional refinery and petrochemical company, together with the support on national energy security, with emphasis on excellence in sustainable business by fostering cost competitiveness and top-quartile returns;

Power business: to pursue public utility service provision to support power security and generate secure income for Thaioil and Subsidiaries.

02

Value Chain Enhancement

to extend its value chain from petroleum refining and add value to Thaioil and Subsidiaries' molecules production. Four businesses in pursuit of this goal are:

Petrochemicals: to focus on value chain expansion to downstream businesses through the expansion of the refining business to olefins and aromatics by pursuing opportunities to extend refinery and petrochemical businesses to meet market demand;

Lubricants and Specialties: to pursue production of specialties in line with evolving industrial trends to meet consumers' demand;

Chemical Distribution: to become a leading chemical distributor in Asian region with a focus on expanding portfolio and product distribution coverage, as well as creating business partnership;

Optimizing the Supply Chain, namely:

- **Marine Transportation:** to enhance security in the transport of crude oil and products for Thaioil and Subsidiaries and PTT Group with long-term cost competitiveness.
- **Development of Logistics, Public Utilities, and Land:** to sustain current and future investment projects.

03

Seed the Options

for new opportunities in innovation, which can be divided into two businesses:

Environmentally Friendly Businesses: to be a foundation for future bio-businesses in line with its strategy on sustainability;

New Businesses: to increase its proportion of new businesses in innovation through investment in Venture Capital Funds and in Startup by focusing on three core businesses: namely, Manufacturing Technology, Green and Human Technology, and Hydrocarbon Disruption Technology. Furthermore, Thaioil and Subsidiaries develop the innovation on Research and Development (R&D) and encourage to commercialize such innovation to promote business growth, increase income, reduce costs, and enhance returns from projects as planned.

To achieve these strategies, Thaioil and Subsidiaries have devised strategies to develop corporate and people's caliber through personnel development and deployment of innovation and technology. Value is also given to environmental and social stewardship as well as governance to support Thaioil and Subsidiaries' achievement of a sustainable entity.

SUMMARY OF BUSINESS ACHIEVEMENTS IN 2019



1. Performance Forged from Perseverance and Operational Excellence Amid Volatile Global Economy

This year was one of Thailoil and Subsidiaries' combined efforts and another year in which we focused on proactive management amid the volatile and challenging global economy. Due to the conflicts among Middle Eastern countries and the US's sanctions against Iran and Venezuela, crude oil prices at the beginning of the year continued to soar until the beginning of Q2/2019, before falling due to the crude oil supply increase in the US. In addition, the global economy became lethargic due to the US-China trade war, leading to investors' continual

worry about the fluctuating and unstable economy. This caused the shrunk spreads between crude oil and products, resulting in Thailoil and Subsidiaries' Accounting Gross Refinery Margin (Accounting GRM) of 3.6 USD per barrel. The aromatics business this year was under constant pressure due to a steep rise of capacity in the market. The lube base oil business also slowed down due to new capacities of Group II and Group III lube base oil entering the market. On the other hand, the demand for Group I lube base oil decreased, resulting in the Accounting Gross Integrated Margin (Accounting GIM) of 5.2 USD per barrel, totaling Thailoil and Subsidiaries net profit of THB 6.277 billion.

Facing the volatility of the oil market and refining industry, Thail and Subsidiaries remained committed to operating business with excellence (Business Excellence) emphasizing Operational Excellence as well as profits. This is an essential corporate culture evident in its successes of process efficiency, process availability management, operation, value chains management in all businesses, and inventory management. As a result, Thail and Subsidiaries have been consistently ranked among the world's leading refineries. In 2019, Thail experienced the most significant major turnaround in Thail's history. Despite the maintenance shutdown of several essential process units at the same time, commanding operational excellence, Thail still maintained operating standards including energy intensity index at the 1st Quartile level and cost competitiveness. Our refinery utilization was at its high level of 107%, superior to other refineries both in the country and the region. In addition, Thail and Subsidiaries instilled in all employees the adherence to safety in operation, with statistics superior to other leading companies in the industry both nationwide and worldwide.

Thail and Subsidiaries remained focused on marketing strategy management for commercial excellence by responding to customers' focus, expanding its new-customer base while maintaining relationship with current customers, and implementing proactive price hedging to prevent the risk of feedstock and product spread fluctuation. Most importantly, Thail and Subsidiaries represented the major domestic supplier, serving 32% market share of total domestic demand for petroleum product, which allowed Thail and Subsidiaries to manage operating cash costs at 2.43 USD per barrel, considered to be a lower operating expense compared with other leading refineries in the same industry.



2. Succession Sustainable Business Management in National and International Levels

Although the environment of the industry was changing, the petroleum and petrochemical businesses continued to grow. The main challenge was climate change with a broad impact that led to systematic environmental management such as stricter environmental regulations, the demand growth for renewable energy such as biodiesel B10, and the development of innovations or technologies to support changes in consumer behavior (Disruptive Technology). The examples of which are the rapid development of electric vehicles, technology to help improve energy efficiency, and change in technology

consumption behavior. Therefore, in response to the changing global trend, which prioritizes sustainable and balanced growth along with intense competition, in 2019, Thailoil and Subsidiaries integrated the sustainability strategy, covering Environmental, Social, and Governance as a guideline for business operations following corporate vision and sustainability goal. The Company has defined strategies and indicators of success in both the short-term (2023) and long-term (2030) to ensure that Thailoil is to achieve its business goals along with sustainable and balanced growth in all aspects.

In addition, Thailoil and Subsidiaries' economic success was made possible by their commitment to corporate governance that is fair, transparent, clear, and auditable. By laying the foundation of integrating the "Governance, Risk, and Compliance" management system to manage operating efficiency, support human rights and anti-corruption, the process was implemented throughout the supply chain to include corporate partners.

For energy, environment, and safety, Thailoil and Subsidiaries prudently operated under its safety and environmental master plan to sustain new capacities on its production sites. In 2019, Thailoil and Subsidiaries carried out 15 energy efficiency improvement projects, which can reduce energy consumption by 1.4 million gigajoules and reduce direct greenhouse gas emissions by up to 84,265 tons of carbon dioxide equivalent per year. In addition, the 239-MW combined-cycle power plant of TOP SPP Co., Ltd. was certified by the Thailand Voluntary Emission Reduction Program (T-VER), for energy efficiency improvement. This is awarded to the company using clean fuels and international-standard high-efficiency technology resulting in the reduction of greenhouse gases and carbon credit certification by

more than 300,000 tons of carbon dioxide equivalent per year, calculated between April 1, 2018-March 31, 2025, or seven years as required by the project requisition.

Thanks to the success in sustainable business management, Thailoil and Subsidiaries have been widely recognized at the national and international level. The Company has been selected as Dow Jones Sustainability Indices (DJSI) member achieving the highest score (Industry Leader) among listed companies of the same industry, and being honored as a member of Emerging Markets for the seventh consecutive year. The Company also earned a Sustainability Awards of Honor for the third consecutive year from the Stock Exchange of Thailand, apart from being classified as one of the companies in the list of sustainable stocks (SET THSI Index). Thailoil and Subsidiaries was also awarded the 2018 Integrity Awards by the Office of the National Anti-Corruption Commission from our transparent business conduct as well as all kinds of anti-corruption activities.

3. Success from Production Excellence and Integrated Management

Thailoil and Subsidiaries focused on group integration management among the refining, lube base oil, aromatics, and Linear Alkyl Benzene (LAB) businesses to connect various departments by jointly planning production and distribution. This resulted in maximum efficiency and ability to produce higher value and quality products than basic refineries to meet market demands. The group integration management also connects with power business, marine transportation of petroleum and petrochemical products, and solvent business, to strengthen the Company's entire supply chain.

Thailoil and Subsidiaries' vital business strategy in 2019 was margin improvement launching such key projects as

Hydrocarbon Management Review, where most benefits were gained from refining diversified unconventional crude; process improvement to increase the production proportion of high-value products; an improvement of energy efficiency; and an increase in the sales proportion of petroleum product in Thailand and ASEAN. The margin improvement projects also include Orchestra, an integrated operating cost management project; and Symphony, a project designed to lower the operating costs which includes manpower management, work process improvement, leveraging of proactive purchasing strategies to establish hiring and purchasing bargaining power, operating expense control, interest expense reduction, and yield enhancement.

Furthermore, Thailoil initiated digitalization projects incorporating technology and digital system in operations (Odyssey Project), to help improve operational efficiency and increase the accuracy of data usage. It can also be used as a tool for internal audit processes, as well as creating new experiences for stakeholders, while reducing operating cost.

4. Achievements from Proactive Market Strategy and Risk Management

Thailoil and Subsidiaries valued the management of marketing strategies. The key to success is the constant management of cordial relationships with domestic and international customers, and the professional service including product with quality meeting standards, on-time delivery, product variety, quick and precise service and problem-solving, and safety standards on product receiving. These increased the proportion of domestic product distribution to 88% of total capacity, and the sales volume from expanding to ASEAN member countries.

In addition, Thailoil and Subsidiaries prioritized improvements to meet customers' needs. This year Thailoil and Subsidiaries relentlessly developed digitalization to improve customer service efficiency through applications such as TOP Energy, an energy communication media; TOP Tracking, information and alerts for customers; and TOP IR, a data center for investors and business partners.

Thailoil and Subsidiaries also succeeded in expanding the solvents business, both domestically and internationally, by focusing on markets in Vietnam, Indonesia, and Myanmar, to finally becoming a leading chemical distributor. In 2019, TOP Solvent Co., Ltd. acquired shares of PT. Tirta Surya Raya (TSR), a solvents and chemicals supply and distributor company in Indonesia. This was considered a milestone in expanding the business to countries with high economic growth in Southeast Asia, and a preparation of Thailoil and Subsidiaries for business expansion to other countries. In addition, the solvent business included new products covering four industrial groups: food ingredients, animal feeds, pharmaceuticals, and raw materials for resin.

Recognizing risks inherently accompanies business, Thailoil and Subsidiaries adopted a proactive risk management, by monitoring all internal and external uncertainties that could affect businesses and investments both in the short-term and long-term through the risk management of all aspects including business strategy, project operation, legal compliance, margin hedging, and foreign-exchange so as to avoid and minimize impacts from such volatility.

5. Success of Projects and Relentless Execution under Strategic Plan

Thailoil and Subsidiaries are strategy-focused organizations that constantly review business

strategies. The 2019 review proved challenging for responses to high market volatility, severe competition, and dynamic business surroundings. The responses therefore needed clarity to support Thailoil and Subsidiaries' vision of **empowering human life through sustainable energy and chemicals**.

In 2019, Thailoil and Subsidiaries successfully executed seven key projects:

1. Clean Fuel Projects Early Work
2. Seeking for investors in the Energy Recovery Unit (ERU)
3. TOP Crude Oil Tank
4. IDEA Project for Basic Infrastructure on Refining Compound
5. Solvents and chemicals business expansion to Indonesia
6. Corporate Venture Capital (CVC) investment, a key mechanism in pursuing the New S-Curve for Thailoil and Subsidiaries which has already invested in one venture capital fund
7. R&D commercialization.

Moreover, the Company still has ongoing projects; the biggest of which is Clean Fuel Project (CFP). The CFP is designed to enhance competitiveness by improving process efficiency and adding value to environmentally-friendly products. The capacity is to increase from 275,000 to 400,000 barrels per day, along with more flexibility to allow more diversified crudes to process, resulting in greater economies of scale and cost reduction. Currently, CFP is on process of engineering design, review of safety design in the distillation unit, procurement of main machinery and equipment, development of systems and work processes, and construction to ensure the commercial operation in 2023. Along with other related agreements, an agreement with Energy Recovery Unit Co., Ltd. (a subsidiary wholly owned by Global Power Synergy Plc) was signed to sell and transfer the ownership of ERU.

This resulted in the reduction of CFP investment by about USD 757 million. Additionally, the Board of Directors approved the investment on Hydrodesulphurization Unit to address the government enforcement of the Euro 5 fuel standard, effective January 1, 2024.

There are also many investment projects on logistics, infrastructure, and public utilities. One of which is the Jetty Expansion Project designed to increase even more safety in the area and reduce port congestion, as well as support larger vessels for transportation and distribution of new products in the future. Other ongoing projects include the construction of a raw water pipeline from Bang Phra Reservoir to increase the capacity and stability of raw water supply to support future projects; TOP Crude Oil Tank Project to accommodate the CFP; and Thailoil Sriracha Building Project to enhance safety of employees and support future expansion. All of these projects are still underway. In addition, Thailoil and Subsidiaries are investigating opportunities for business growth and investment with business allies both in PTT Group and in ASEAN member countries, which typically boast high demand growth for petroleum and petrochemicals.

Thailoil and Subsidiaries focus on heightening long-term sustainability through investment portfolio management to increase new businesses in accordance with industrial trends and energy consumption transformation in the future. The Company also develop projects for support functions covering HR development, finance, treasury, social and environmental responsibilities, and research and innovation. In 2019, Thailoil and Subsidiaries commercialized R&D innovations consisting of Cyclo-Pentane 80, Motor Operating Valve Protection (MOV), and K-2 Gate Valve Device. Moreover, the R&D was featured in other projects, including catalyst development with partners in the Hydrodesulphurization Unit for Euro 5 fuel process, construction of a pilot plant

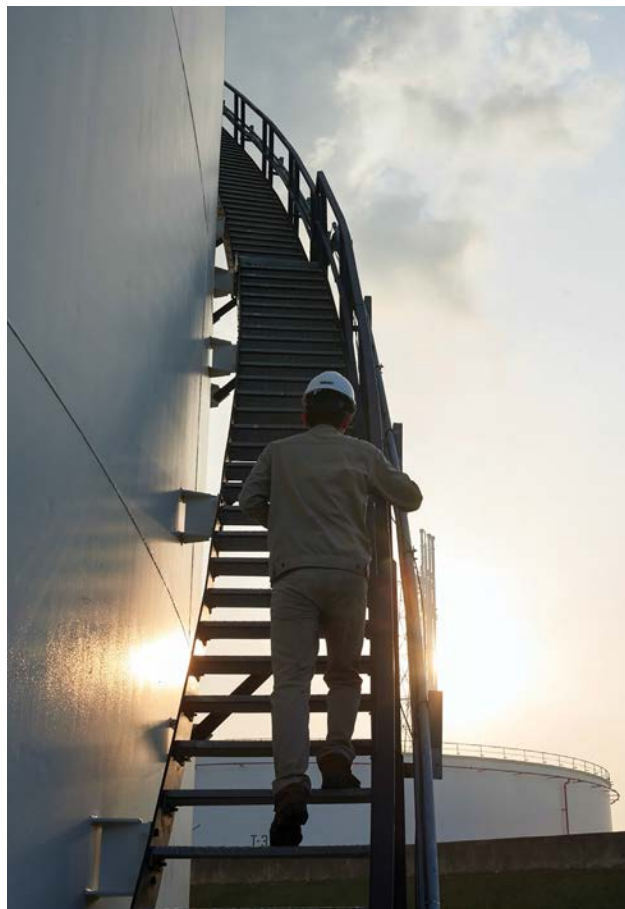
for Residue Hydrocracker (RHCU) for the CFP, and the fuel oil flocculation test with various blending components after the commissioning of CFP to define guidelines for crude selection from different sources.

6. Excellence in Corporate Governance, CSR, and Stakeholder Stewardship

Apart from the determination of becoming a high-performance organization, top executives of Thailoil and Subsidiaries are fully committed to corporate governance, responsibilities for communities, societies, and environment and sustainable development through business processes and various activities. This leads to the Company earning widespread acceptance from people, business, and industry sectors.

Moreover, Thailoil and Subsidiaries valued the safety of employees, contractors, and communities around the refinery. As a result, our safety statistics are maintained at the leading global position. Thailoil and Subsidiaries are convinced that sustainable growth can be achieved only when community, society, and environment are developed in parallel through the target-oriented process under good corporate governance and ethical management.

This year's key sustainability projects included the handover of the "Thailoil Building", a center of accident and emergency medical treatment and the launch of "Café Amazon for Chance" at Laem Chabang Hospital under the operation of Sarn Palang Social Enterprise Co., Ltd., to create job opportunities for the hearing impaired. In addition, Thailoil and Subsidiaries supported the installation of solar farms for Thanyarak Mae Hong Son Hospital in Mae Hong Son, Koh Sichang Hospital in Chonburi, and Ban Huai Tong Border Patrol Police Learning Center in Nakhon Si Thammarat, as well as reforestation in Chonburi.



Thailoil and Subsidiaries are determined to apply their half-century experience, expertise and skills in energy leadership, coupled with operational and corporate governance excellence as well as responsibility for society, the environment, and communities, to maximize stakeholders' satisfaction, and to assure that businesses are strengthened to sustainably become part of Thai society.

All the above mentioned achievements and commitment have earned Thailoil and Subsidiaries numerous awards from various leading organizations as shown under "2019 Achievement".

MILESTONES OF 2019

January



Thaioil sold and delivered an innovative product named K-2 Gate Valve Device, a device for turning on/off large valves to the first customer, PTT Tank Terminal Co., Ltd.



Thaioil donated to victims of Pabuk Tropical Storm in the southern provinces through and worked with PTT Group to prepare 6,000 survival bags for those in need.



Thaioil organized National Children's Day activities to provide knowledge about energy to youths at PTT Head Office and the Thaioil and Subsidiaries Community Health and Learning Center, Sriracha District, Chonburi.

February



Thaioil won the 2019 RobecoSAM Sustainability Award (Silver Class) in Oil & Gas Refining & Marketing Industry Group at a global level.



Thaioil and the Marine Department organized "Love the World, Use Cloth Bags with Thaioil and the Marine Department" activities to promote the use of cloth bags and provide knowledge on marine waste at the Koh Loi Pier, Sriracha District, Chonburi.



March



Thaioil was awarded the 8th NACC Integrity Awards, presented by Police General Watcharapol Prasarnrajkit, Chairman of the Office of the National Anti-Corruption Commission.



Thaioil received the Thailand Top Company Awards 2019 in the energy industry sector from Professor Kasem Watanachai, Privy Councillor, organized by Business⁺ Magazine and the University of the Thai Chamber of Commerce.



Thaioil was honored with the 39th "Suriyasasithon Award" for its desk calendar named "Sriracha...Our Home" from ACM Chalit Pukbhasuk, Privy Councillor, organized by the Public Relation Society of Thailand.

April



Thaioil organized the 2019 Annual General Meeting of Shareholders for interested shareholders to attend and inquire about Thaioil's operations.



TOP Solvent held the inauguration ceremony of a solvent and chemical terminal at Hai Phong, to increase the storage and distribution capacity of solvent products with Mr. Thani Saengrat, the Thai Ambassador at Hanoi, Vietnam, presiding over the ceremony.

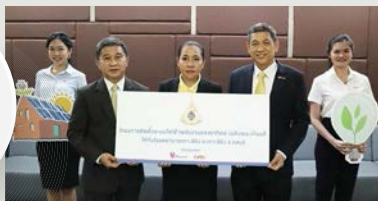


May



Thaioil and Energy Recovery Unit Co., Ltd. (wholly owned by Global Power Synergy Plc (GPSC)) signed an agreement to sell and transfer the ownership of Energy Recovery Unit (ERU) with Dr. Siri Jirapongphan, Minister of Energy, presiding over the ceremony.

June



Thaioil and GPSC installed a solar power system at Koh Sichang Hospital to foster energy stability and reduce the hospital's long-term electricity cost.



Thaioil held a foundation stone laying ceremony for the Thaioil Sriracha Buildings to increase land-use efficiency at the refinery area and support future investments.



Thaioil achieved three Asian Excellence Awards at the 9th 2019 Asian Excellence Awards 2019, organized by Corporate Governance Asia, Hong Kong and Asia's leading magazine which focused on economic and corporate governance news.

MILESTONES OF 2019 (CONTINUED)

July



Thaioil organized the annual activity for minor shareholders to attend the performance briefing of Thaioil and Subsidiaries and visit Vidyasirimedhi Institute of Science and Technology (VISTEC).



Thaioil's Board of Directors attended a performance briefing and visited operating sites during the major turnaround.



Thaioil, in collaboration with Silpakorn University, organized a printmaking exhibition from the "The 1st Thaioil Art Contest 2019" project under the theme "Thai People's Happiness" at Baan Chao Phraya Art Gallery.

August



Thaioil and CHPP (a subsidiary of GPSC) signed a Private PPA to install a solar power generation system for the Thaioil Sriracha Buildings.



Thaioil was awarded the Drive Award 2019 Excellence in the Resources category from the Faculty of Commerce and Accountancy, Chulalongkorn University.



Thaioil organized a handover ceremony of the CEO between Mr. Atikom Terbsiri and Mr. Wirat Uanarumit.

September

MEMBER OF
**Dow Jones
Sustainability Indices**
In Collaboration with RobecoSAM



Thaioil was certified as a member of the Dow Jones Sustainability Indices (DJSI) for the seventh consecutive year and recognized as an industry leader in Oil & Gas Refining & Marketing Industry Group.



Thaioil and PTT Group donated funds to the Prime Minister to aid flood victims in the North and Northeast Region through the "Ruamjai Thais Aid Flood Relief" program.



Thaioil was honored with The Strongest Commitment to Sustainable Energy in Southeast Asia Awards from Alpha Southeast Asia Magazine for the eighth consecutive year along with three other national awards.



Thaioil organized the inauguration and handing over ceremony of the "Thaioil Building" for Laem Chabang Hospital to be used as an accident and emergency medical treatment center with Mr. Pakrathorn Thianchai, Chonburi Governor, presiding over the ceremony.



Thaioil and TOP SPP Co., Ltd. were awarded with Certificate of Honor on Greenhouse Gas Emission Reduction in "Roi Duangjai Ruam Jai Lod Lok Ron" (One Heart Combat Global Warming) campaign, organized by the Thailand Greenhouse Gas Management Organization (Public Organization).



Thaioil received a CSR - DIW Continuous Award for the 11th consecutive year from the Ministry of Industry.



Thaioil delivered a solar power generation system to Ban Huai Tong Border Patrol Police Learning Center in Nakhon Si Thammarat to stabilize their electricity system.



Thaioil organized the CFP Groundbreaking Ceremony.

October



Thaioil successfully issued and offered USD 565 million of senior unsecured debentures with overwhelming public interest in spite of the lowest interest rate offer in the history of Thaioil.



Thaioil offered electronic guarantee services using the Blockchain system, an innovation to facilitate customers with service speed, security, and transparency, resulting in increased business opportunities.



Thaioil supported the Ministry of Energy's Biodiesel B10 usage policy.

MILESTONES OF 2019 (CONTINUED)

November



Thaioil received Sustainability Awards of Honor for the third consecutive year along with the Best Investor Relations and Sustainable Stocks at the SET Sustainability Awards 2019, organized by the Stock Exchange of Thailand (SET).



Thaioil was honored with a Human Resource Management Excellence Award at the Thailand Corporate Excellence Awards 2019.



Thaioil and GPSC supported a solar power generation system project for Thanyarak Mae Hong Son Hospital, Mae Hong Son.



Thaioil signed a memorandum of agreement with PTT Group on budget support for Kamnoetvidya Science Academy and the Vidyasirimedhi Institute of Science and Technology.

December



Chief Executive Officer and President, in an audience with Her Royal Highness Maha Chakri Sirindhorn, Chair of the Thai Red Cross, received a commemorative pin for the contribution to the “150-YEAR Srisavarindranusorn Building” fund.



Labix Co., Ltd. was honored with the Environmental Governance Award.



Thaioil received the Sustainability Disclosure Award from the Securities and Exchange Commission and Thaipat Institute.



Thaioil organized the Thaioil Charity Run 2019 at Bang Phra Reservoir to donate the proceeds to public charities in Sriracha District.

2019 ACHIEVEMENTS

Sustainability Awards

MEMBER OF
Dow Jones
Sustainability Indices
In Collaboration with RobecoSAM

ISAM
Sustainability Award
Silver Class 2019



01

Membership of the 2019 Dow Jones Sustainability Indices for the seventh consecutive year and an industry leader in Oil & Gas Refining & Marketing Industry Group.

02

Sustainability Award (Silver Class), presented at the 2019 RobecoSAM Sustainability Awards for the Oil & Gas Refining & Marketing Industry Group.

03

Honorary Award for Sustainability Listed Company for the third consecutive year at the SET Sustainability Awards 2019.

04

Sustainability Disclosure Award 2019, presented by the Securities and Exchange Commission and ThaiPat Institute.

05

"Sustainable Stocks" for listed companies for the fifth consecutive year from the Thailand Sustainability Investment Awards 2019 (THSI).

06

The Strongest Commitment to Sustainable Energy in Southeast Asia Award for the eighth consecutive year, from the Alpha Southeast Asia Awards 2019.

Management Awards



07

The 9th Asian Excellence Awards presented by the Corporate Governance Asia Magazine:

- Asia's Best CEO
- Asia's Best CFO
- Asia's Best Investor Relations Award for the sixth consecutive year.

08

Thailand Top Company Awards 2019 in the Energy Industry category, given by Business+ Magazine.

09

Human Resource Management Excellence Award, given at the Thailand Corporate Excellence Awards 2019.

10

Drive Award Excellence, Resources category, presented by the Faculty of Commerce and Accountancy, Chulalongkorn University.

11

Gold and Silver Awards, won at the PTT Group OpEx and Innovation Awards 2019.

Environmental Awards



12

Certificate of Honor on Greenhouse Gas Emission Reduction in "Roi Duangjai Ruam Jai Lod Lok Ron" (One Heart Combat Global Warming) campaign.

13

Honorary award for "Support Community Forest for Global Warming Reduction Project", given by the Royal Forest Department.

14

TMS received SSHE Excellence Award for the second consecutive year from the PTTEP SSHE Forum 2019.

15

SAKC received Responsible Chemical Management Award, Gold Award, presented by the Federation of Thai Industries.

16

Labix received Environmental Governance Award, presented by the Ministry of Industry.

Investor Relations Awards and Others



17

Outstanding Investor Relations Award, given at the SET Sustainability Awards 2019.

18

Best Senior Management IR Support, given at the Alpha Southeast Asia Awards 2019.

19

The 39th Suriyasasithon Award for the desk calendar set named "Sriracha...Our Home", presented by the Public Relation Society of Thailand.

Corporate Governance and Social Responsibility Awards



20

The NACC Integrity Awards, presented by the Office of the National Anti-Corruption Commission.

21

The Strongest Adherence to Corporate Governance and Best Strategic Corporate Social Responsibility Award, presented at the Alpha Southeast Asia Awards 2019.

22

The CSR-DIW Continuous Award for the 11th consecutive year, presented by the Ministry of Industry.

MARKET REVIEW 2019 AND MARKET OUTLOOK



Market Review 2019

Global Market and Economic Review

The 2019 global economic growth recorded the lowest of 3.0% in 10 years, according to the International Monetary Fund (IMF) Report published in October 2019, which considered a drastic drop from 3.6%, recorded in 2018. Such drop was pressured by the significantly sluggish international trade, resulting from the manufacturing in the industry sector being affected by the ongoing trade war between the US and China. The global economic decline was recorded worldwide, falling from 2.3% in 2018 to 1.7% in 2019 for the advanced economies and from 4.5% to 3.9% for the developing countries. Economic slowdown in the advanced economies was driven mainly by sluggish industrial growth in the US and the Eurozone, while

China and India's economies were the main culprit for economic slowdown in the developing countries. Due to the US-China trade war, last year economic growth recorded the lowest in 27 years for China and 6 years for India. The concern on economic slowdown led to Central Banks in many countries worldwide launching fiscal and monetary measures to stimulate their economic systems which would contribute to global economic growth. This was led by the Federal Reserve Bank (FED) of the US implementing the expansionary monetary policy, which included the decrease in the interest rate, the first time in 10 years, and the repurchase of state bonds after program abandonment in 2013.

Crude Oil Market and Refining Industry

With the lower global oil demand following the global economic slowdown, the 2019 average crude oil price

fell from 69.7 USD per barrel in 2018 to 63.5 USD per barrel in 2019. The International Energy Agency (IEA) issued a forecast of global oil demand growth dropping from 1.1 million barrels per day in 2018 to 1.0 million barrels per day in 2019. On the contrary, the US crude supply and export were constantly rising. In November 2019, the US production capacity was up 7.3% year-on-year to 12.9 million barrels per day, and the crude exports surged 48.4% or by 0.9 million barrels per day to a total export of 2.9 million barrels per day. The jump in crude exports was escalated by the commissioning of new pipelines. The global crude oil price was, however, maintained by the output cut by OPEC and allies of 1.2 million barrels per day, in addition to crude supply decrease of 1.2 million barrels per day from Iran and 0.6 million barrels per day from Venezuela due to the economic sanctions imposed by the US on crude exports.

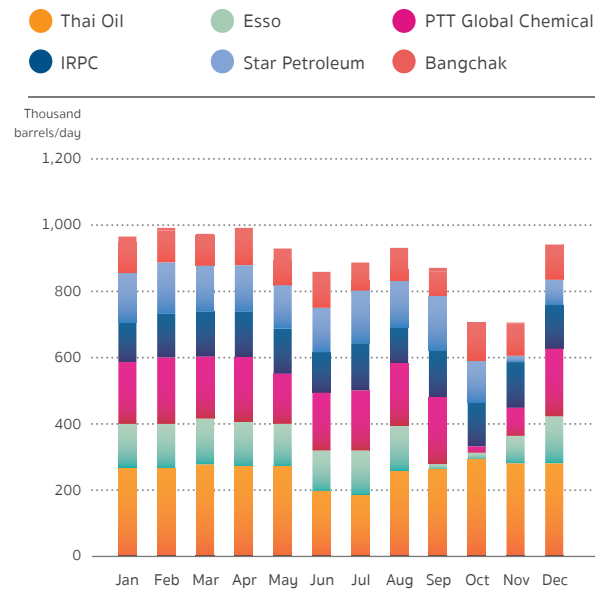
Compared to the previous year, the 2019 refining industry was stagnant since the gasoline market was pressure by the high-level supply due to the US' constant increase of light crude capacity and China's increase in gasoline export from the commissioning of two additional large refineries. Demand for diesel and jet fuel was also under pressure from slow demand growth following the global economic slowdown, driven by the prolonged US-China trade war and warmer winter in Northern Asia and Europe. The high sulphur fuel oil market was pressured by the decrease in demand of bunker fuel to address the enforcement of the International Convention for the Prevention of Pollution from Ships by the International Maritime Organization (IMO).

Domestic Market of Petroleum Products

The domestic economic growth projection made by the Office of National Economic and Social Development Council (NESDC) for 2019 was 2.6%, compared to 4.1% in 2018. Four major contributing factors were (1) a 2.6% drop in major export items, including electronics and parts, automobiles, rice, rubber, and cassava; (2) a drop in manufacturing production index in both industrial and agricultural sectors, driven by lower global demand after the prolonged US-China trade war; (3) a constant fall in the global electronics market; and (4) a contraction of the domestic tourism industry. The 2019 inbound arrivals were recorded at 39.8 million tourists, equivalent to 4.2% growth, a drastic drop from the 7.3% growth in 2018. The biggest drop was the number of Chinese tourists, which accounted for 27.6% of total arrivals, despite several measures launched by the public sector, including exemption of fees on visas on arrival until April 2020 and exemption of visa application for tourists from China and India. Thailand's economy was, however, expected to grow 4.3% on private consumption and 2.7% on total investment, driven by several factors, including stably low rates of interest, inflation, unemployment, economic stimulus policies, and public welfare programs for the low incomes.

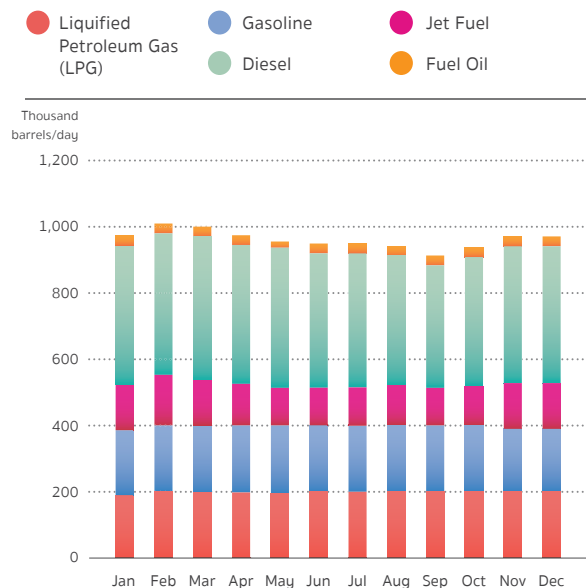
Domestic demand for petroleum products rose 1.0%, led by a 3.7% growth of gasoline in line with the growth of private consumption, and a relatively low retail prices of petroleum products following crude price in the global market. With a very narrow spread between gasohol 95 and gasohol 91 prices, the demand of gasohol 95 increased. On the contrary, the wider spread between gasohol E20 and gasohol E85 pushed higher demand for gasohol E85. However, the lower industrial manufacturing and export suppressed the demand growth for diesel to merely 1.2%, while the demand growth for jet fuel rose up only 0.8%, reflecting lower tourism growth, resulted from a sluggish economy worldwide and Thai Baht appreciation despite the continuous launch of several measures to stimulate the economy and tourism focusing on tourists' more spending, especially those from China, India and Southeast Asia. The demand for fuel oil decreased by

2019 Domestic Refinery Production



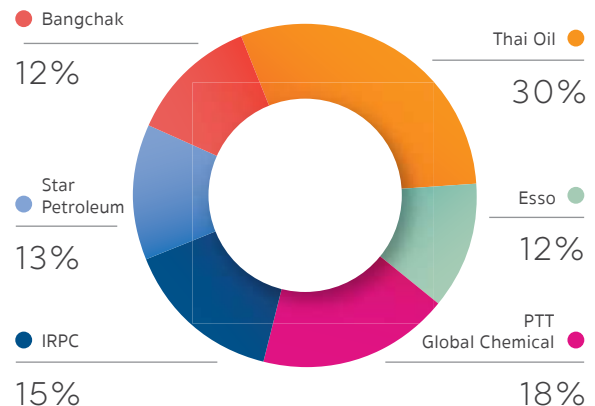
Source : Department of Energy Business, Ministry of Energy

2019 Domestic Demand for Petroleum Product



Source : Department of Energy Business, Ministry of Energy

2019 Share of Refining Output



Source : Department of Energy Business, Ministry of Energy



10.5% due to the continuous fall of demand for bunker fuel in marine business, and for fuel oil in the industrial and power sectors, as well as the fuel oil demand in 2019 relapsing to normal condition after the neighboring countries' demand for fuel oil in 2018 surged due to the off-spec fuel oil situation in Singapore.

The average petroleum production of domestic refineries in 2019 stood at 911,339 barrels per day, declining from 1,002,720 barrels per day in 2018, mainly due to annual maintenance shutdowns. However, Thaioil maintained the highest production share in the country of 30%, compared to peer refineries.

Aromatics Market

Despite high demand for paraxylene in Q1/2019 due to the ongoing tight supply in 2018, the paraxylene market in 2019 became more sluggish due to the

highest-recorded additional supply of 6.1 million tons per year from the new 'crude-to-chemical' petrochemical complex in China, commissioned in Q2/2019, and two other new plants in China and Brunei commissioned in Q4/2019. These additional supplies forced some high-cost petrochemical plants to cut down their production or shut down their production units. Even so, the actual shutdowns were realized more slowly than expected leading to severe oversupply in the latter half of 2019 amid the slower demand growth from 3.7 million tons per year in 2018 to 2.3 million tons per year in 2019. The reason for the slower demand growth was China's policy to reduce import of plastic waste for recycling in 2018, resulting in the increase in paraxylene demand to replace the recycled plastic, while polyester gained a constant demand growth for the garment and textile industry.

The ongoing oversupply led to the stagnant benzene market in 2019 compared with that of 2018. Because of the high spread between paraxylene and ULG 95 from late 2018 through Q1/2019, Paraxylene producers increased their production, and the by-product benzene reached oversupply, driving down the benzene market sharply in the first half of 2019. Later, the benzene production decreased following the lower production of paraxylene, and was exported to the US and EU markets in Q3/2019. This led to a gradual balance of benzene supply even though China reduced the benzene import due to the commission of new petrochemical plants in China, and slowly recovered market compared to others. The overall 2019 benzene supply increased by 2.1 million tons, while the demand growth was at 1.1 million tons. The imbalance was due to lower demand for downstream products, caused by the ongoing trade war between the US and China.

Lube Base Oil and Bitumen Market

After the arrival of 2.3 million tons of additional supply of lube base oil Group II and Group III from new plants in China, Bangladesh and Singapore, the 2019 lube base oil market was down from the previous year. The market was undersupply by at least 1.64 million tons, due to the maintenance shutdowns in 2019, compared with 1.48 million tons in 2018. The demand growth worldwide registered at 0.4%, about the same level of 0.3% growth in 2018.

More intensive development projects in many countries of the region, particularly on infrastructure including construction and repair of roads and highways, uplifted 2019 Asian bitumen market higher from the 2018 level amid lower economic growth and investment constraints, resulted from the ongoing trade war between the US

and China. The market was also supported by a wider spread between bitumen and high sulphur fuel oil prices from the aforementioned higher bitumen demand. The decrease in fuel oil price was resulted from the enforcement of the International Convention for the Prevention of Pollution from Ships by International Maritime Organization (IMO) in 2020.

Linear Alkyl Benzene (LAB) Market

The 2019 LAB price was lower from that of 2018 due to the lower price of its feedstock, which was pressured by the decreasing crude oil price in the global market resulted from the ongoing trade war between the US and China. The lower LAB price was also resulted from the lower demand from India, the major export market of LAB, since India had turned to Europe and Egypt for LAB import instead. However, the spread between LAB and its feedstock was wider in 2019 than that of previous year, due to demand growth in Asia in line with the higher population and better quality of life in emerging economies. Moreover, LAB plants in Japan with the capacity of 90,000 tons per year were permanently closed in late May 2019 together with more maintenance shutdowns of LAB plants in India, China and Saudi Arabia during Q3/2019 and Q4/2019, suppressing the supply in Asia.

Solvent Market

The lower domestic and global economic growth in 2019 pressured the demand for solvents in all industries amid an oversupply in both domestic and international market since 2018, resulting in more and more severe price competition in 2019. Specifically, after the US-China trade war, the solvent demand of China, Northeast Asia's biggest solvent purchaser, plummeted. Chinese solvent producer, therefore, could not sell products in domestic market and had to export

more to Southeast Asian market compared to 2018 export. South Korea, Japan and Taiwan also exported more solvents to Southeast Asia in 2019.

In Thailand, solvent importers increased their inventories by importing from China and Taiwan since mid-2018, resulting in the oversupply and affecting the 2018 financial performance. Thai solvent importers had to reduce imports in Q1/2019 to cut losses, leading to less oversupply and price competition, and eventually higher financial performance compared with that of Q1/2018. However, Thailand's economy stayed stagnant for the rest of the year 2019, resulting in the decreasing overall solvent demand compared to that of the same period in 2018, and heating up the price competition. This was evident in some product's price being lower than their cost, leading to the constant adjustment of marketing strategies to ensure the goals achievement.

The international market encountered the same condition; the sluggish global economy pushing for more price competition. The Asia's solvent oversupply, especially in China and South Korea, caused the solvent exports from Thailand to Northeastern Asian markets to become lethargic, since the price competition in this region was more aggressive than Southeast Asian and South Asian markets. Also, Thai Baht appreciation became a significant constraint for Thai exports. Vietnam, on the contrary, took advantage to attract more foreign investment amid the trade war between the US and China, and could drastically increase the sales volume of solvents and chemical products in 2019. Such foreign investors turned to Vietnam for production base for export to the US market. Nevertheless, the solvent market situation in Vietnam was encountering the price competition like other markets in the region.

Petroleum Transportation Industry

Due to the global and regional sluggish economy and the maintenance shutdowns by several refineries, the demand and freight rates of vessels transporting crude, petroleum products and petrochemicals in 2019 were constantly pressured. On the contrary, the Very Large Crude Carrier (VLCC) market turned significantly positive in the latter half of 2019 due to higher demand for VLCCs amid lower availability. The number of VLCC decreased due to several factors, including the ongoing trade war between the US and China; the sanction on Chinese COSCO vessels; the US economic sanction on crude exports from Iran, driving shipowners to turn VLCCs into floating storage; geopolitical tension in the Persian Gulf; explosive attacks on refinery in Saudi Arabia and Iranian crude carriers, etc. The demand of offshore supporting vessels and crew boats to support the exploration and production tended to slightly increase.

Ethanol Market

The 2019 domestic ethanol demand for blending gasohol rose 6.5% from that of 2018 to 4.4 million liters per day, following the constantly increasing demand for gasoline and reasonable retail prices of petroleum product due to stably low crude prices in global market, and the public sector's measures to promote ethanol as a feasible alternative energy. Moreover, many more modern automobile models compatible with E20 and E85 gasohol were launched, while the service stations distributing gasohol E20 and E85 was also expanded, resulting in higher consumption of ethanol.

The 2019 domestic ethanol oversupply was caused by the 47.3% increase of ethanol inventory compared to that of previous year. Such inventory increase was resulted from the high molasses-based ethanol

production, which is evident in the sugarcane volume of 131 million tons in 2019 – the similar volume to 135 million tons in 2018. Moreover, the amount of cassava used for ethanol production increased due to the decrease in cassava chip export after China, the major cassava importer, reduced the cassava import and used the corn inventory for ethanol production instead, as well as implemented stricter import policies. In addition, Vietnam has entered into Thailand's cassava market for competition.

The 2019 ethanol price fell to 22.0 THB per liter, a 7.1% drop from 2018, following the price drop of raw materials and crude oil.

Power Industry

As of September 30, 2019, the total domestic power capacity excluding power generated by Independent Power Supply increased by 5% from the previous year, and stood at 47,260 megawatts (MW). This total capacity can be divided into Electricity Generating Authority of Thailand (EGAT) of 31%, the Independent Power Producers (IPPs) of 32%, and the Small Power Producers (SPPs) of 20% and 17% by others.

The total power consumption of the first nine months of 2019, excluding power generated by Independent Power Supply, surged 4.3% from 2018 due to higher consumption by the household and business sectors from the warmer climate and higher temperatures, and the ongoing protest in Hong Kong. Industrial consumption was, however, lower due to lower power generation in line with lower exports caused by the ongoing trade war between the US and China. The 2019 peak power consumption was 32,273 MW, recorded on May 3, 2019.

2020 Market Outlook

Global Market and Economic Outlook

The International Monetary Fund (IMF) issued a projection that the global economy would grow 3.4% in 2020 recovering from the lowest growth in 10 years last year (October 2019 Report). This is supported by the global economic upturn after expansionary policies through monetary measures launched by the Central Bank in many countries, including interest rate cut and government bond repurchase to increase liquidity in the economic system. The 2020 economic growth comes from economic expansion of both advanced and emerging economies. The growth of advanced economies, compared to previous year, is expected at 1.7% since the US economy is likely to constantly grow from the increasing domestic consumption and strongly growing labour market. On the other hand, the growth of emerging economies is estimated at 4.6% from the previous year. Such growth is contributed by India's robust economies growth expected at 7.0%. On the contrary, China's economic growth is likely to slow down from 6.2% 2019 to 5.8% in 2020, due to China's economic reform and stagnant growth of industrial sector.

The 2020 global economic growth rate is to encounter risk factors slowing down such growth, including the ongoing US-China trade war and its uncertain consequences despite some negotiation progress, as well as higher geopolitical tensions, especially in the Middle East.

Crude Oil Market and Refining Industry

Crude Oil Market

The 2020 average price of Dubai crude is expected in the range of 55-65 USD per barrel, supported by

higher global demand growth of 1.2 million barrels per day (International Energy Agency (IEA) December 2019 Report). The demand increase is due to the 3.4% global economic growth forecast, after the US-China trade war progressed with the first-phase trading negotiation in December 2019, and anticipated the next phase in 2020, leading to recovering economies. The OPEC and allies have also agreed to limit more of their production from 1.2 million barrels per day to 1.7 million barrels per day in Q1/2020 to maintain the stability of crude price. Oil production from Iran and Venezuela will also remain at the low level due to export limitation from the economic sanction imposed by the US. The geopolitical tension in the Middle East also causes the concern on supply risk.

Nevertheless, the 2020 crude oil price is still pressured since the global crude supply tends to increase especially from such non-OPEC countries as the US, Norway, Canada, and Brazil, with estimated growth around 1.8-2.2 million barrels per day. Oil production in the US is likely to increase by 1.4 million barrels per day, mainly from shale oil, which accounts for 70% of the total production due to the commissioning of more pipeline in 2019 and 2020. The US crude export is likely to increase by 0.7 million barrels per day to 3.6 million barrels per day in 2020. Oil production of Norway would rise 0.3 million barrels per day after its full-steam production of the oil field in the North Sea.

Refining Market

The refining industry is likely to be supported by the enforcement of the International Convention for the Prevention of Pollution from Ships imposed by the International Maritime Organization (IMO) mandating

all vessels to use fuel oil with sulphur below 0.5 ppm. This enforcement has spiked demand for low sulphur fuel oil and diesel, while supply of gasoline is expected to fall, as some refineries are likely to increase diesel production to address the higher market demand. The spread between fuel oil and Dubai crude is likely to become narrower, following the lower demand due to the IMO new regulation enforcement. However, the Gross Refinery Margin (GRM) is likely to be pressured since Saudi Arabia and China plan for the commission of new refineries in 2020, resulting in the similar amount of demand and supply growth at around 1.2-1.3 million barrels per day.

Domestic Market for Petroleum Products

The 2020 economy of Thailand is expected to grow 2.7-3.7%, projected by NESDC in November 2019 Report. The key drivers for such growth are higher household consumption, state and private investments in Thailand's infrastructure, and economic stimulus measures under government policies. Such measures better the growth of export and tourism following the global economic recovery and the adjustment to trade barrier measures. The export sector is set to expand 2.3%, while private sector consumption and investment are projected to grow 3.7% and 4.8% respectively.

Thailand's consumption of petroleum products in 2020 is projected to grow 2.0%; considering by each type, it is found that gasoline, diesel, jet fuel and fuel oil are to grow at 3.3%, 2.2%, 2.3% and 5.0% respectively. The consumption of LPG is, on the contrary, set to fall 2.4%.



Aromatics Market

The 2020 paraxylene market tends to be constantly pressured by additional supply from the commissioning of new petrochemical plants in 2019 and 2020, including Zhejian PC Line 2 in China with capacity of 2,000,000 tons per year and Saudi Aramco Jizan in Saudi Arabia with capacity of 800,000 tons per year. Due to the commissioning of a new PTA plant with capacity of 5.3 million tons per year, the total paraxylene effective capacity in 2020 is expected to rise 8.2 million tons, while the global demand is expected to increase 1.4 million tons. This will help support paraxylene to some extent causing paraxylene production to decrease from 80.6% in 2019 to 74.3% in 2020.

Similar to paraxylene market, the benzene market situation in 2020 remains the same as that of 2019. Since it is constantly pressured by additional supply from the commissioning of new plants in 2019 and 2020. This results in the estimate of new capacity in 2020 at 3.4 million tons, while the demand is expected to grow at 1.2 million tons, causing the global production to decrease from 75.7% in 2019 to 73.8% in 2020. However, the high-production-cost paraxylene plants with by-product benzene have not shown any signs to operate again, since it is still under the break-even reducing some of the supply. The US-China trade war must be closely monitored, to define if it causes the continuous slowdown of benzene and downstream products among continents.

Lube Base Oil and Bitumen Market

The lube base oil situation in 2020 remains the same as that of 2019, due to the rapid increase of supply after

the commissioning of Group II and III new lube base oil plants (total capacity of 1.2 million tons per year), including Hill Refinery in Kazakhstan (capacity of 250,000 tons per year), and Hainan Handi Refinery in China (capacity of 1,000,000 tons per year) while the demand growth is considerably low. However, the competition of lube base oil Group II will be less aggressive, as its feedstock price is referenced to the diesel price, which is expected to increase, following the enforcement of the IMO new regulation. This causes the price of lube base oil Group II to increase, while that of Group I is under less pressure.

The 2020 bitumen market is expected to be less active than that of 2019 due to additional supply with some fuel oil producers turning to produce more bitumen after the enforcement of IMO new regulation, causing a lower price of fuel oil and a narrower spread between bitumen and fuel oil. The demand for bitumen is, however, projected to increase due to economic development plans of many countries in the region, emphasizing on the constant development of public utility and roads construction and repair.

Linear Alkyl Benzene (LAB) Market

LAB market tends to slightly recover due to better global economic growth and more demand for detergent products resulted from constantly increasing population, leading to satisfying overall demand growth of LAB in Asia and Middle East. In the first half of 2020, it is expected that LAB supply will be tight due to the maintenance shutdown of LAB plants in Southeast Asia. However, in the latter half of 2020, LAB market is expected to encounter pressure from the commissioning of new LAB plants in Saudi Arabia scheduled in Q3/2020 (capacity of 120,000 tons per year).

Solvent Market

The Bank of Thailand forecasted that Thailand's 2020 economic growth would decrease to 3.3%, lower than previously expected of 3.8%. The risk factors affecting the growth decline includes domestic political uncertainty, tardiness of the government's mega-project investments, and the unresolved trade war between the US and China, leading to export slowdown, which affects the investment of the private sector. Thai Baht appreciation also obstructs Thailand's export and tourism competitiveness. The 2020 solvent market can be categorized by products as follows:

>> Hydrocarbon Solvent (HCS) Group: Despite Asia's sluggish economies, the supply of HCS in Asian market is expected to increase, especially from Northeastern Asia producers, including China, Japan, and Taiwan, increasing their production capacity to meet any rising demand. This leads to the oversupply of HCS. The unresolved trade war between the US and China causes China's demand to slow down and China to export more to Southeast Asia to replace exports to the US. Moreover, the producers from Japan, South Korea, and Taiwan are to find new destination in replacement of China's market. The new destination includes Southeast Asia countries.

The domestic HCS demand is expected to increase in line with economic growth. Even though the 2019 solvent industry is slow down and exports grow negatively, it is expected that the 2020 export of automobiles, spares and parts, as well as electronics, is to grow, leading to higher consumption of HSC. More supply volume than that of demand causes the price competition to be more aggressive.

>> Toluene-Xylene-White Spirit (TXW) Group: TXW is categorized as HSC, but due to its large volume and market size, TXW is separately presented to better reflect the market situation. TXW demand and supply are mainly in accordance with the volume used as fuel additives and in the petrochemical industry. TXW supply is expected to increase due to the constant oversupply of paraxylene since 2019 after the commissioning of new plants in China leading to TXW product surplus. Even though in early 2020 TXW demand for fuel additives is to increase, it is expected that the demand will briefly increase in early 2020 and slow down in the middle of the year, leading to more TXW supply in petrochemical industry.

The 2019 domestic TXW demand decreased, following the sluggish growth of the automotive industry, along with lower export volumes of spares and parts. This resulted in the decrease of demand for automotive paints, tyres, car seats, glue and other related equipment. However, 2020 TXW demand, both domestic and international, is expected to increase. On the other hand, domestic producers are to control sales volumes as did in 2019 to ensure the market balance, leading to a less aggressive price competition than that of other group.

>> Chemical Solvent (ChemSol) Group: With additional supply from new producers in China and Southeast Asia, the ChemSol market continues to be in oversupply. In addition, the unresolved ongoing trade war between the US and China will force China to export to countries in Southeast Asia as did in previous years. This leads to the same aggressive price competition as that of other product group, despite the shutdown plan of many producers.

Thailand imports nearly all ChemSol products, and the capacity expansion as well as new plants, especially in China, will push even more surplus. This, together with lower-than-expected economic growth, results in even more severe price competition. Many ChemSol importers decided in 2019 to reduce or stop the import of some ChemSol products with unforeseeable long-term profiting. With more prospects identified in Southeast Asia, especially Thailand and Indonesia, several new importers are expected to enter the business with an intention, not only to expand their market in the region, but also to move the distribution base from China to Southeast Asia due to China's lower demand. This inevitably leads to an intense price competition.

>> **Non-Solvent and Food Ingredient and Cleaning Group:** Despite the export fall and negative sentiments in nearly all industrial sectors in 2019, the food and beverage sector has remained strong, with growth recorded in both domestic consumption and export, as it is deemed necessary and basic needs for living. Demand for food ingredient and cleaning products in industries, also, remains at the same level; at the same time, Thailand has competitive advantages on food manufacturing for export due to the richness and fertility of agricultural products in volume and variety. This causes the domestic demand and supply of food ingredients and cleaning products to continuously grow in line with economic growth. Despite a slight decrease, the growth of food ingredient and cleaning products is still higher than that of solvent products, constituting the Company goal

to expand this product group in 2020. Nevertheless, Thailand is facing a risk of water shortage crisis in 2020 after a year of drought and flood in 2019, causing periodic shortfalls of finishing products due to shortage of raw material, and possibly leading to the demand drop of products in this group.

Petroleum Transportation Industry

For marine transportation of crude and petroleum and petrochemical products in 2020, it is expected that freight rates are to slightly increase due to the enforcement of IMO new regulation limiting the sulphur in fuel oil below 0.5 ppm, causing shipowners' cost to increase. On the other hand, VLCC freight rates are expected to slightly decrease from that of late 2019 since the demand and supply of vessels are gradually in balance, despite several new vessels in service. Such several new vessels are caused by the estimate of the same number of vessels to be decommissioned due to the approaching time to enforce the installation of Ballast Water Management System, which is not worth the cost of long-service vessels. Moreover, the increase in US crude export, following the increase in crude oil price, is likely to push the demand for vessels. The offshore demand is expected to grow due to the increasing activities of old rigs decommissioning, including petroleum exploration and production. This constitutes further growth for offshore businesses.

Ethanol Market

With a state policy to continuously support the consumption of gasohol with higher ethanol components, the demand for ethanol in 2020 is projected to grow. Moreover, the Department of Energy Business (DOEB) plans to phase out one type of gasoline and promote

gasohol E20 as a primary product. The DOEB also adjusts spreads between gasohol 95 and gasohol E20, and between gasohol E20 and gasohol E85 to ensure suitable level. All these measures are geared toward higher demand for ethanol.

Ethanol supply in 2020 is also projected to increase with the total capacity higher than domestic demand. This results from the capacity expansion of one new molasses-based facility in Q3/2020, resulting in an additional 200,000 liters per day. This surges the total ethanol capacity to 6.08 million liters per day in 2020 or 2.7% increase from that of 2019.

The 2020 ethanol price tends to increase compared to that of 2019. The predicted harsh weather and severe drought of 2020 will likely cut down the total national sugarcane inventory from 131 million tons in the 2018-2019 season to 111 million tons in the 2019-2020 season, as some sugarcane fields would be left idle. This causes the reduction in sugarcane inventory, and therefore reduces the use of molasses for ethanol production. For Cassava crop of October 2019-September 2020, the product volume is expected to decrease from 30.9 million tons in previous season, to 30.5 million tons due to El Niño and cassava mosaic disease found in 15 eastern provinces. The decrease in cassava volume causes its price to increase though the price is slightly pressured by the lower starch yield of cassava produced during higher-than-usual

rainfall during August-September 2019 and being early harvested.

Power Industry

The 2020 power demand is projected to slightly increase, in line with Gross Domestic Product (GDP). The new investment of small power producers are expected to replace the power plants whose contracts with EGAT are due to expire during 2017-2025. In this regard, the government opens for the renewal of the contracts on the production and sales of power and steam with EGAT. The excess power is to be sold only to users in industrial estates and industrial parks.

Thailand's 2018-2037 power development plan (PDP 2018) prioritizes the security of power generation systems, transmission systems, and distribution systems. The development plan also focuses on the balance of regional electric system, suitable level of power security, increase in electric system flexibility, the promotion of low-cost power generation from renewable energy, lowering impacts on environment, and the development of smart grid to address prosumers' changes. The expected power generating capacity at the end of PDP 2018 is 77,211 MW in 2037, with a higher ratio of power generated from renewable energy and more participation of communities in power generation, while capping electricity tariffs at current levels.

PRODUCTION PROCESS, PROCESS DEVELOPMENT, AND QUALITY, SECURITY, SAFETY & OCCUPATIONAL HEALTH AND ENVIRONMENTAL MANAGEMENT



Production Process and Process Development

In 2019, Thairoil's total refining utilization of crude oil and other feedstock was 295,261 barrels per day, or 107% of the nameplate capacity, while Thai Lube Base Plc and Thai Paraxylene Co., Ltd. commanded 221,545 tons per year or 83% of the nameplate capacity, and 589,398 tons per year or 70% of the nameplate capacity, respectively. Producing precursors of cleaning agents, Labix Co., Ltd., produced 134,689 tons per year of Linear Alkyl Benzene (LAB), equivalent to 113% of the nameplate capacity.

In June and August 2019, Thairoil shut down some units for inspection and maintenance, which were efficiently

carried out. To enhance capability and competitiveness for optimal results, Thairoil executed various projects to raise process efficiency and production operation, as highlighted below.

Thai Oil Plc

- >> Recognized as a member of Dow Jones Sustainability Indices for the seventh consecutive year in 2019, achieving the top scores (Industry Leader) in Oil & Gas Refining & Marketing Industry Group, from its international level of sustainable operation regarding economy, society, and environment.
- >> Received a certificate of honor under the Low Emission Support Scheme (LESS) Project for its

efforts on increasing energy efficiency and reducing greenhouse gas (GHG) emission from Thailand Greenhouse Gas Management Organization (Public Organization)

>> Improved productivity by implementing the margin improvement project, the operating cost management project named Orchestra, and the cost of fund management project named Symphony, resulting in THB 5.441 billion before tax⁽¹⁾, higher than target. Notable achievements included the procurement of new crudes and long residue with suitable quality and prices, process improvement, energy conservation, and oil loss prevention.

>> Implemented energy conservation and oil loss prevention by pursuing over 10 efficiency improvement projects, leading to energy saving of 34.8 MW while successfully meeting the Solomon's Energy Intensity Index. The cost saving totaled around THB 260 million a year. Highlights included:

- Improved the cleaning of heat exchangers in Crude Distillation Unit (CDU)-1/2/3 to reduce fuel consumption and constantly maximize refining utilization rate.
- Injected anti-foulants into the heat exchangers of CDU-3 to reduce fuel consumption.
- Lowered the volume of hydrogen in the reactor to reduce energy consumption at Hydrocracking Unit-1.
- Replaced catalysts at Continuous Catalyst Regeneration Platformer Unit-1/2 and improved the production unit to raise the maximum utilization rate by about 5%, thus increasing platformate for gasoline and aromatics production and reducing energy consumption.

- Replaced catalysts at Hydrocracking Unit-1/2 during the major turnaround, thus producing more jet fuels and premium diesel while reducing energy consumption.

- Replaced catalysts at Isomerization Unit to increase efficiency and reduce energy consumption.

>> Completed maintenance of Continuous Catalyst Regeneration Platformer Unit-2, about 5.1 days sooner than planned, thus resulting in more aromatics production.

>> Conducted maintenance of High Vacuum Unit-3 by changing the material of pipes in the unit to accommodate future high sulphur long residue.

>> Replaced adsorbents in Pressure Swing Adsorption-1/2 during the maintenance shutdown, thus producing more hydrogen from the reduction of hydrogen loss during pure-hydrogen separation.

>> Replaced catalysts at Gasoil Hydrodesulphurization Unit-2/3 for higher efficiency, more diesel yields, and longer-life of catalysts.

>> Constructed and moved the reservoir for more volumes to accommodate CFP, and moved the system of water for firefighting and the raw-water filtration unit to the new reservoir location.

>> Improved the biodiesel blending process for B10 and B20 high-speed diesel to promote biodiesel B100 as required by a measure of the Ministry of Energy to make B10 the standard high-speed diesel and B20, as an alternative.

>> Started utilizing five new crude oil tanks with a total volume of 250 million liters to enhance refining security and accommodate future higher sales volumes of domestic petroleum products.

⁽¹⁾ Equaling THB 4.353 billion after corporate income tax.

- >> Produced bunker fuels with a maximum sulphur content of 0.5 ppm, an improvement over the former 3.5 ppm content, to reduce air pollution under the MARPOL Annex VI Treaty, effective from January 1, 2020. Thailoil has prepared and started the production since October 2019.
- >> Engaged in the expansion construction of Jetty Expansion Project to reduce port congestion and enhance the distribution capability by accommodating larger vessels. The project is due for commercial operation in 2020.
- >> Constructed nine crude oil tanks with a total volume of 700 million liters to accommodate refining and the increase in sales volume of domestic petroleum products from CFP. The tanks are expected to complete and be ready for operation in 2021.
- >> Improved Gasoil Hydrodesulphurization Unit-2/3 to enable Euro 5 diesel production to meet standards prescribed by the public sector; such standards will be effective on January 1, 2024.

Thai Lube Base Plc

- >> Efficiently produced and started commissioning sooner than planned after the shutdown for preparation for a project to improve the usage of long residue at the lube base oil production unit, thus resulting in 100% operational availability.
- >> Investigated and launched projects to improve the production unit's process for higher energy efficiency, including
 - Installation of a new set of smaller ejectors at the High Vacuum Unit, thus lowering the medium-pressure steam by one ton per hour.

- Installation of a new set of burners at the heating furnace for hot oil, thus saving more energy expenses.
- >> Procured new, more cost-effective long residue for processing, thus lowering production costs.
- >> Produced more special-grade bitumen to meet domestic and overseas customers' needs.

Thai Paraxylene Co., Ltd.

- >> Carried out maintenance of all units for efficient production regarding product quantity and quality as well as energy conservation.
- >> Replaced adsorbents at Parex Unit and replaced catalysts at Isomar Unit to increase paraxylene capacity by reducing xylene loss from process, and enhance energy efficiency by lowering Parex Unit extracts.

Labix Co., Ltd.

- >> Efficiently produced thus leading to 100% operational availability.
- >> Increased capacity for more LAB by.
 - Improving and controlling production at Union Fining Unit and Molex Unit for greater efficiency of Molex adsorbents and greater paraffin production, thus generating more profit.
 - Improving and controlling production at Pacol Unit to increase the efficiency of catalysts to ensure long life utilization.
 - Engaged in additional feedstock (n-Paraffin) procurement.

Thailoil Power Co., Ltd.

- >> Successfully achieved higher utilization rate and higher availability of generators than planned.

- >> Carried out maintenance of generators as planned, including combustion inspection and hot gas path inspection to maintain plant reliability and machinery efficiency at high level.
- >> Carried out maintenance of power generating machinery concurrently with Thailoil's major turnaround, thus preserving its power distribution opportunities and still meeting customers' demand.
- >> Measured heat rates of gas turbine power generators and regularly cleaned compressors to maintain good fuel consumption for production rate, resulting in higher efficiency of gas turbine power generators than targeted.
- >> Added to the Company's target the reduction of NO_x emission due to an environment awareness. Through all the previous year, the NO_x emission was continually controlled below the target.

TOP SPP Co., Ltd.

- >> Received a commemorative plaque under the Thailand Voluntary Emission Reduction (T-VER) Program of Thailand Greenhouse Gas Management Organization (Public Organization) in honor of its 239-MW combined-cycle cogeneration plant project.
- >> Achieved a higher utilization rate than planned.
- >> Shut down gas turbines as planned including combustion chamber inspection and hot gas path inspection: measures designed to ensure the reliability of gas turbine power generators and enhance the heat rate efficiency.
- >> Commissioned the independent inspectors to measure the index of Primary Energy Saving (PES) of both power generating projects as required by the

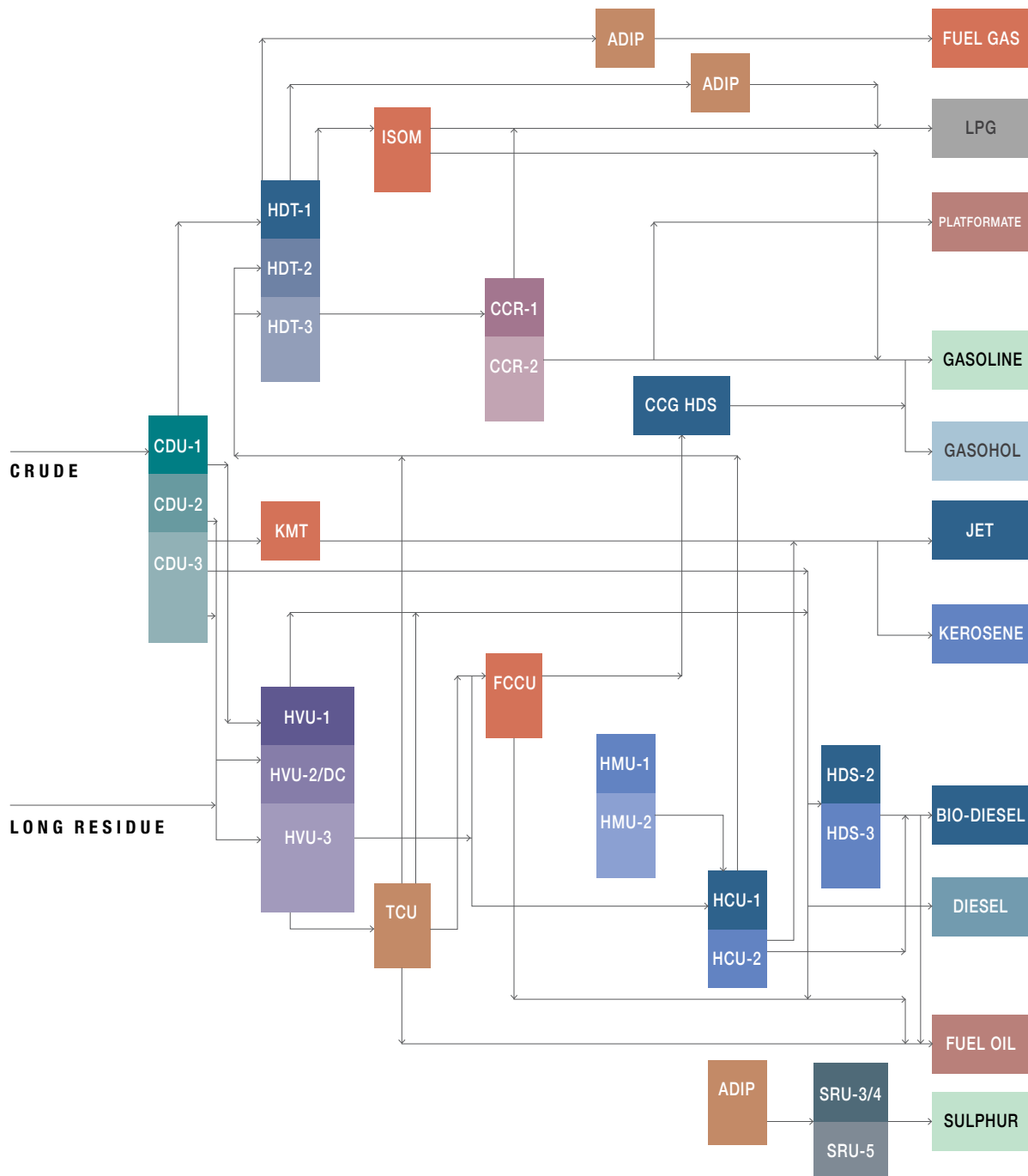
Power Purchase Agreement (PPA). It was found that both projects commanded higher PES indices than expected. As a result, TOP SPP Co., Ltd. benefited from having the highest fuel saving (FS).

- >> Established measures to achieve energy conservation goals and reduce costs by
 - Utilizing Heat Recovery Steam Generator to produce high-high-pressure steam in place of a full steam generator.
 - Increased the usage cycles of the mineral removal unit in the boiler feed water to reduce the volumes of chemicals used in the regeneration process.

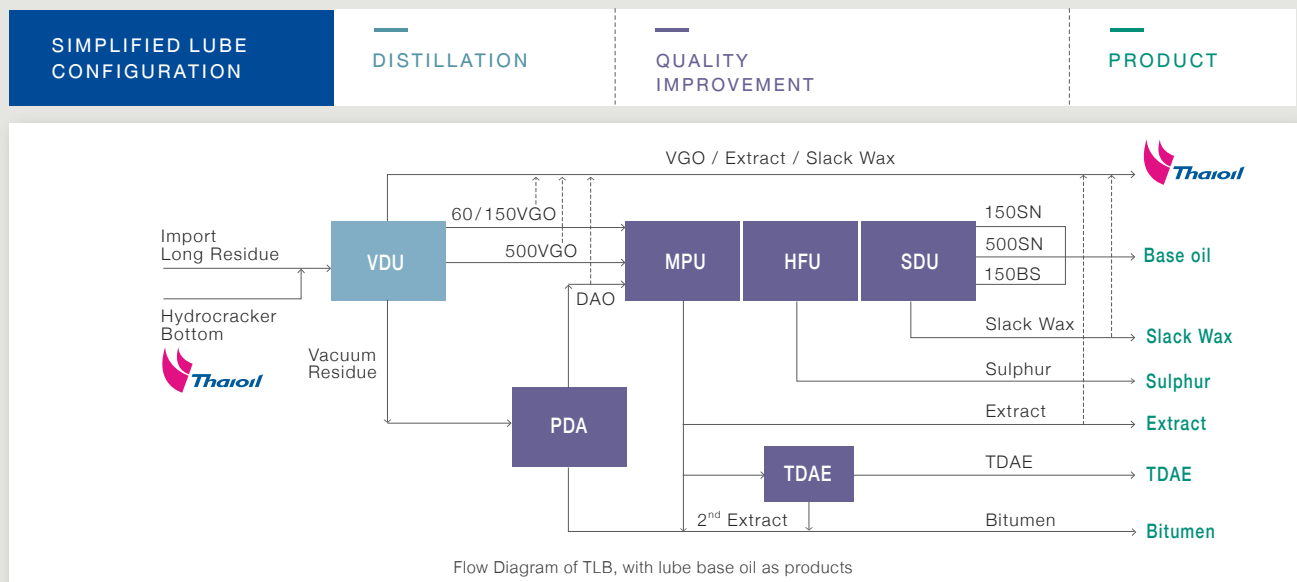
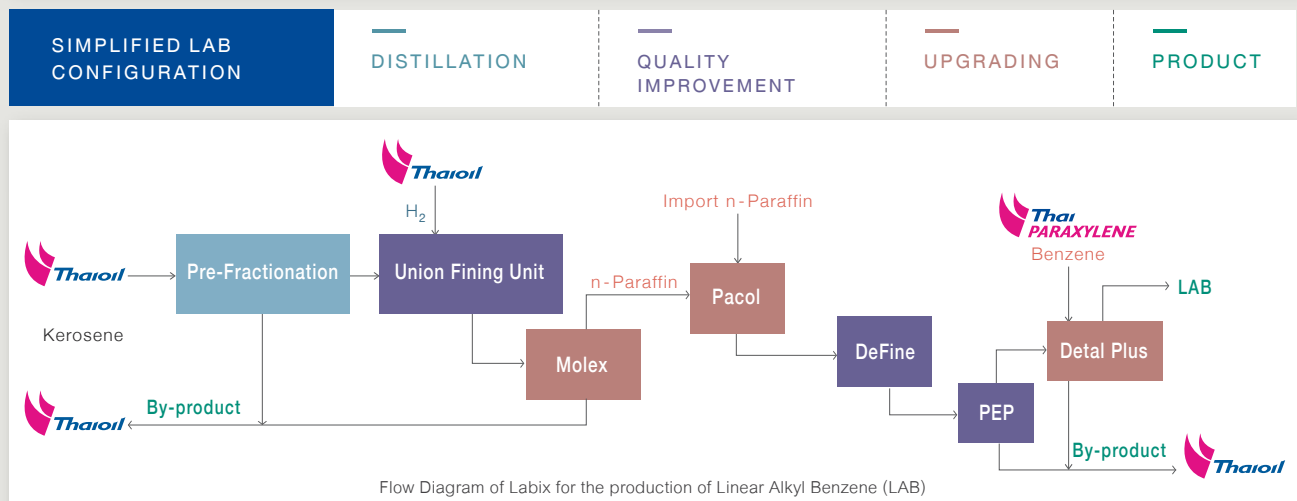
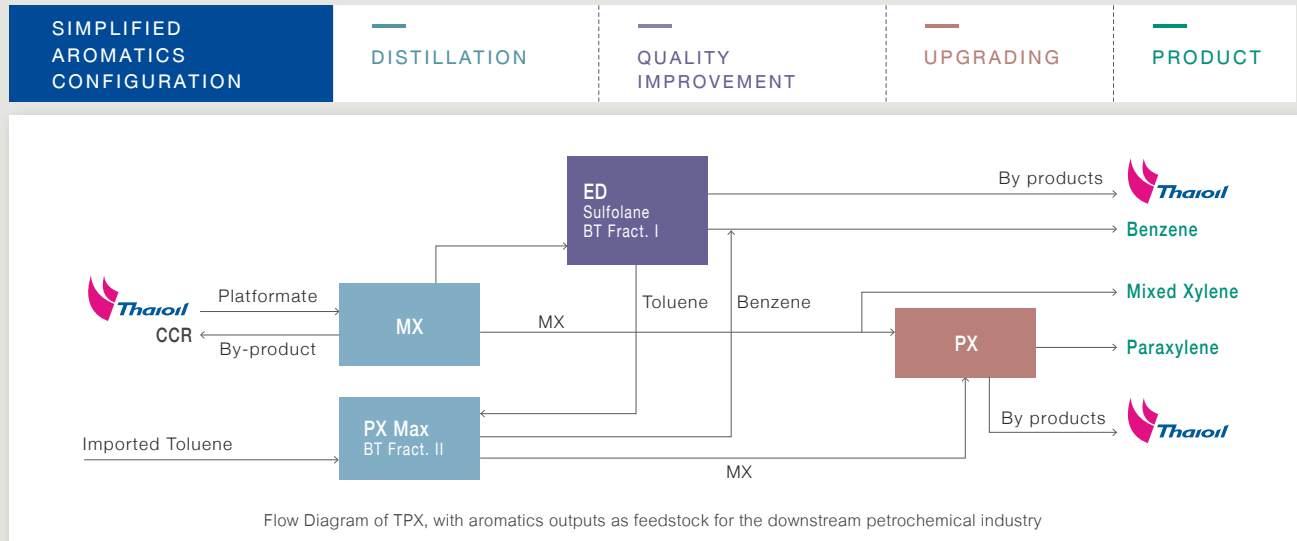
Refining Performance Assessment

With the aforementioned executions, Thailoil successfully maintained its excellence in oil refining capability at an excellent level, satisfactorily maximizing plant utilization and maintaining very high operational availability. As for energy efficiency as reported by Solomon Benchmarking in 2018, it was found that Thailoil's energy efficiency ranked in the second-quartile against other Asia-Pacific companies. After the completion of CFP, Thailoil will further increase its competitiveness to the top quartile. Thai Lube Base Plc also successfully maintained its first-quartile energy efficiency against other companies worldwide. These performances confirmed Thailoil and Subsidiaries' commitment to continuously improving and developing its refining caliber to maintain its refinery leadership in Asia Pacific.

CRUDE AND FEEDSTOCK REFINING PROCESSES
INCLUDING PETROCHEMICAL AND LUBRICATING OIL PROCESSING OF THAIOIL AND SUBSIDIARIES



Flow Diagram of Thailoil Refinery



Quality, Security, Safety, Occupational Health, and Environmental Management

Thaioil and Subsidiaries have defined guidelines for the management of quality, security, safety, occupational health, environment, energy, and social responsibility. Serving as the operating scope is the QSHE Policy of Thaioil and Subsidiaries under the TOP Group QSHE Excellence 2019-2023 strategy for driving and enhancing Thaioil and Subsidiaries' capability in pursuit of QSHE excellence in a consistent and sustainable manner. Below are the integrated management systems in place:

1. Quality Management System (TIS 9001: 2015)
2. Environmental Management System (TIS 14001: 2015)
3. Safety and Occupational Health Management System (TIS 18001)
4. Occupational Health and Safety Management System (BS OHSAS 18001: 2007)
5. Integrated Management Systems (IMS)
6. Management System for Competence of Testing and Calibration Laboratories (ISO/IEC 17025)
7. Corporate Social Responsibility (CSR) under the CSR-DIW Project (ISO 26000)
8. Data Security Management System (ISO/IEC 27001:2013)
9. Energy Management System (ISO 50001: 2011)
10. Operational Excellence Management System (OEMS)
11. Process Safety Management System (PSM)

Since 1996, Thaioil and Subsidiaries have maintained and relentlessly improved all its management systems. These systems are managed under the corporate policies on quality, security, safety, occupational health, environment, energy, and social responsibility in all following aspects:

>> Define business plans and targets, and implement them to control and reduce potential impacts of business processes under international practices

involving water, air, sound, heat, garbage, waste, greenhouse gas (GHG) emissions, energy management, and energy conservation, as well as to review, monitor, and evaluate results for continuous improvement.

- >> Formulate a systematic risk management plan by defining measures to control and minimize operating risks and constituting emergency and crisis management plan to ensure business continuity. Such risks include physical, chemical, biological, and psychosocial aspects, and the plans and measures are designed to prevent incidents that may cause loss, injuries, and illnesses to operators, communities, and other stakeholders. Such plans and measures are expected to protect the organization's assets and information, being aware of security threats and relevant risk levels.
- >> Promote and nurture an awareness among all stakeholders of the importance of maintaining and elevating quality, security, safety, occupational health, environment, energy management, and social responsibility, as well as the importance of proper labour by communicating designed practices to ensure the understanding through all the organization as well as further to the public.
- >> Promote continuous development, reviews, and updates of policies and operating procedures to keep up with changes in laws and regulations, technological advancement, energy consumption and conservation, and prevailing environmental and social circumstances, as well as encourage the constant implementation of such policies and practices.
- >> Produce quality goods and services in response to customers' needs and expectations to meet their satisfaction under Thaioil and Subsidiaries' integrated

management systems and standard excellence management, which are in compliance with laws and regulations, as well as applicable standards and specifications.

>> Allocate adequate resources, information technology system, and innovation for the compliance with business policies and operations. The design, product procurement, and services of which are to constantly take into account the efficiency and improvement of quality, security, safety, occupational health, environment, energy management, and social responsibility.

Today, Thaioil and Subsidiaries have modified their strategies moving toward business excellence to be prepared for the operation of the world-class refinery in the next four years. To this end, safety is one of the

pillars to be improved and upgraded. In addition, to ensure world-class safety performance, Thaioil and Subsidiaries have modified its corporate safety goal to “No Harm, No Leak, Goal Zero”, which resulted in fine-tuning and adjusting the operating strategic plan from “Safe White Green” to “All SAFE White Green”. This change aims to develop and elevate the awareness and leadership of operating safety. The meaning of All SAFE White Green is as follows:

| | |
|-------|---|
| All | : All Employees and Contractors |
| S | : Standard of Works |
| A | : Awareness on Hazards and Risk Assessment |
| F | : Full Compliance to Work Standard with Proper Site Supervision |
| E | : Ensure Continuous Improvement |
| White | : Drug-Free |
| Green | : Environmental Impact Mitigation |



Moreover, Thail and Subsidiaries remain committed to proactive action plans or strategies through QSHE Roll Out activities emphasizing on accessibility and campaigns on increasing awareness of quality, security, safety, and environment of operators or around operating sites. This is to extend to cover all operating sites and enhance the participation of operators through activities within current work environment. Thail and Subsidiaries are fully committed to applying more suitable management systems to ensure sustainable development.

To this end, there was a regular outcome report for executives' acknowledgement and joint solutions finding. There will be a management review each year to establish improvement and work plans which will be communicated periodically to employees to ensure effective implementation.

Security Management

Thail and Subsidiaries enforce strict security measures to safeguard personnel, properties, information, and reputation from security and safety threats, embracing the International Declaration of Human Rights. We are strictly committed to the corporate policies on quality, security, safety, occupational health, environment, energy management, and social responsibility to prevent impacts of security threats to society, economy, politics, and natural disaster with executions as follows:

>> Reviewed security threat assessment. Thail defined and reviewed operating plans on security measures, both physical security and security management, in line with prevailing risks or threats. The Company also formed a network for intelligence plans and manpower with the public and private sectors, as well as external

support. Security drills for emergency response were conducted to evaluate and improve plans for maximum effectiveness.

- >> Applied digitalization in the security management during the major turnarounds in 2019, including radio frequency identification and face recognition.
- >> Supervised and encouraged best security and safety practices stated in the Security and Safety Handbook for Employees of Thail and Subsidiaries to ensure employees' safety at work and at home.
- >> Managed security through the All SAFE White Green strategy for a White Workplace, free of drugs and security incidents, as defined by "White". All contractors and business partners were encouraged to take part in policy formulation, planning of security programs, and campaigning the activities to prevent drugs and all other illegal substances, as well as security violation.
- >> Integrated security management system in conjunction with that of CFP contractors in both physical security and security management for maximum efficiency and effectiveness.
- >> Staged the International Ship and Port Facility Security Code (ISPS) Exercise in conjunction with local government agencies so that the operating team may review their procedures and measures for controlling, preventing, and countering potential security threats.

At Thail and Subsidiaries, the corporate security strategy is designed and managed under the Defense in Depth approach, classifying areas of responsibility into restricted and semi-restricted zones with specific

sets of security measures, control systems, and internal management systems for Thailoil and Subsidiaries. For external zones or zones surrounded by adjacent communities and other business entities, a different set of security measures is applied, including integration of security strategy and activities with public security agencies, such as Chonburi's Disaster Prevention and Mitigation Unit, the Royal Thai Army (14th Military Circle, Chonburi), Laem Chabang Provincial Police Station, the EOD Unit of the Special Police Operation Division, the Royal Thai Navy (First Naval Base, Sattahip), the Air and Coastal Defense Command, and the Navy Diver & Ammunition Unit.

Occupational Health and Safety Management

Thailoil and Subsidiaries' business goal is to be an accident-free (No Harm) organization for contractors, employees and related stakeholders. To this end, the executives have expressed their determination and support through a five-year plan on occupational health, safety, and the emergency and crisis management. A designated unit takes direct charge of controlling and driving all activities under the work plan. Executives and employees are assigned to a committee on occupational health, safety, and environment (SHE Committee), with more than 50% of the committee members coming from employee representatives at the operating level (excluding the chairman). The committee meets at least once a month with minimum agenda on sharing and dissemination of SHE updates, monitoring of SHE progress, and preparation for future activities. In 2019, the corporate safety goal was improved to "No Harm, No Leak, Goal Zero", and a review was made to the five-year plan on occupational health, safety, and the emergency and crisis management to

align with the new corporate strategic plan and goals. Revision was made to occupational health and safety management systems, risk assessment for potentially severe incidents, work permits, and high-risk work processes that could cause accidents. Procedures, pre-work safety inspection forms, and risk assessment were developed together with competency upgrading of those performing specific jobs under work permits and those with other specific duties. These were communicated to relevant parties, leading to efficient and effective execution. Performance analysis and systematic learning from major accidents were carried out. Also, Thailoil and Subsidiaries verified the alignment of plans and measures, and defined proactive indicators to monitor such alignment with the required procedures. Finally, high-level executives constantly reviewed safety outcomes.

Since the safety culture represents success in the goal achievement, Thailoil and Subsidiaries modified its strategic operating plan from Safe White Green to All SAFE White Green in order to develop and elevate the awareness and leadership on safety among all employees and contractors through QSHE Roll Out activities. These activities were held among different sites, particularly during annual maintenance and in project areas under construction to campaign for operators' awareness and encourage their participation in day-to-day activities with the site environment.

Below are the highlights of Thailoil and Subsidiaries' actions on occupational health and safety this year:

>> Showed commitment to the cultivation of safety awareness, starting from the Board of Directors, by assigning high-level executives to present case

studies and significant safety issues from inside and outside the corporation at the Board meeting each meeting to promote continual development and improvement of safety measures.

- >> Organized executives site visits, led by the CEO and President and high-level executives, during regular work period, shutdown, and project construction to provide morale support to all operators and demonstrate their commitment to and support on safety and good safety leadership practice.
- >> Modified strategic plans moving toward business excellence to be prepared for the operation of the world-class refinery over the next four years. To this end, safety is one of the pillars to be improved and upgraded. To ensure world-class safety performance, Thailoil and Subsidiaries have modified its corporate safety goal to "No Harm, No Leak, Goal Zero" in line with the new strategy.
- >> Revised the five-year plan on occupational health, safety, emergency and crisis management to align with internal and external circumstances, various risks, and new strategic plans and goals.
- >> Revised the identification and assessment of potential risks posting severe accidents. Defined control and preventive measures together with constant monitoring of the effectiveness of these measures. Inspected process safety. Analyzed and proposed remedies and prevention of recurrence. Finally, executives held monthly reviews of safety performance.
- >> Revised the Permit to Work system, particularly permits for hot work, to align with international best practices.
- >> Developed and assessed employees' competence on

safety and emergency and crisis management in line with their roles through the Competency Assurance System.

- >> Staged the All SAFE MTA Project during the 2019 major turnaround.
- >> Staged the "90 Days No Harm Project" in late 2019 to prevent and reduce work accidents. This stressed and encouraged employees and contractors to be aware of the intensified work safety. The goal was that no one was injured and required a medical treatment case (MTC). Thailoil succeeded on realizing its goals and defining additional safety measures as follows:
 - Contractor companies: High-level executives and safety managers were invited to a workshop to constitute accident prevention and reduction plans and review related work procedures. All risks were re-assessed and contractors were duly informed. The number of supervisors was reviewed and duly increased in order to match the work volume.
 - Contractor supervisor: Forms and toolbox talk topics were initiated, while daily reports were assigned with a focus on the preparation of checklist for eight high-risk types of work, tool inspection for readiness, and contractors' 100% usage of Personal Protector Equipment (PPE).
 - Contractors: The focus was on the compliance with safe operating procedures and PPE correctly wearing at all times during work on site.
 - Superintendents: The Refinery, Engineering, and Quality Management departments focused on safety inspection on sites, as well as verification of implementation alignment, and commanded an order to cease operations deemed unsafe.

- Campaign activities: The QSHE Newsletter named Countdown, was issued daily. Enough campaign signboards were put up on site. Mobile PR vans were arranged to visit different operating sites to communicate safety matters.
- >> Campaigned for employees and contractors to learn from incidents as well as best practices, in order to review and improve process safety and emergency and crisis management to prevent severe incidents, while developing emergency and crisis management practices in pursuit of international standards.
- >> Enhanced awareness of dangers and strict compliance with the 12 Life-Saving Rules, while campaigning for Potential Incident Reports (PIRs) with a focus on unsafe acts and unsafe conditions, both of which are preventive measures.
- >> Revised health risk assessment during the major turnaround with a focus on proactive measures or prevention of work-related diseases. To this end, doctors and a team of occupational health experts inspected and monitored the effectiveness of such control and preventive measures. In addition, risk-based health check ups and check ups for those performing high-risk jobs were given. Such measures were analyzed and the improvement was proposed to systematically prevent reoccurrence.
- >> Assessed Health Performance Indicators against the criteria and guidelines of the International Association of Oil and Gas Producers (IOGP), an international standard. The 2019 assessment of Thailoil yielded a score of 3.36 out of 4. The improvement plan for the management system was developed to align with IOGP criteria and regulations.
- >> Emergency and crisis management plans, as well as contingency plans, were revisited to align with international best practices. The Emergency Control Center was also improved to assure that it was up-to-date and efficiently ready for service.
- >> Improved the system of water for firefighting and firefighting pond to effectively address emergencies or put out fires, embracing all potential emergencies in process areas and product tanks farm. High-efficiency water injectors were procured to increase Thailoil and Subsidiaries' firefighting capability.
- >> Assessed severe risks and reviewed safety control and preventive measures by defining plans and measures under the Defense in Depth approach, including severe risks, notably chemical leaks during discharge. Emergency drills were conducted for various emergency levels and extended to crisis management, in conjunction with external and local government agencies, to prevent and mitigate business impacts and assure that Thailoil and Subsidiaries can continue their management and control of severe risks at manageable levels.

Process Safety Management

Thailoil and Subsidiaries' ultimate operating goal is to operate business without a loss of primary containment (LOPC) and without process incidents leading to losses of lives, properties, environment, and reputation. Therefore, Process Safety Management (PSM) is a vital success factor that drives and enhances the capability of Thailoil and Subsidiaries in the achievement of the "No Harm, No Leak, Goal Zero" goal for PSM excellence. Since 2018, Thailoil has formed a Technical Safety unit to upgrade the PSM on a par with OSHA

International Standard, focusing on proactive risk management to prevent severe accidents. As a result, Thailoil and Subsidiaries have successfully operated businesses in a sustainable manner and have been the organization with safety throughout the operation chain.

Below are Thailoil and Subsidiaries' key PSM actions:

- >> Revised the status of PSM against the requirements of OSHA international standard as well as international best practices.
- >> Constituted a five-year PSM plan to develop and upgrade the PSM system in line with international best practices for world-class excellence with the "No Harm, No Leak, Goal Zero" goal.
- >> Developed and upgraded key PSM processes including Hazard Effect Management Process (HEMP), process isolation, mechanical integrity, preparation of protocols, checklists, and assorted process-related recordings.
- >> Improved management practices for accident and incident investigation and report, incident management, and lessons learned.
- >> Cultivated PSM awareness with the 10 Process Safety Fundamentals together with Process Safety Management and Bearer Thinking.
- >> Conducted PSM inspection together with formulation of inspection plans, checklists, report, monitoring and correction, and systematic analysis of outcomes.
- >> Defined leading and lagging PSM performance indicators under the requirements of the American Petroleum Institute Recommended Practice 746 (API RP 746), including leaks of hydrocarbons or hazardous chemicals (LOPC Tier 1 and 2). Performance outcomes are to be reviewed weekly by executives.

Environmental Management

Thailoil and Subsidiaries recognize the importance of environmental management to systematically control and mitigate potential impacts. In 2019, Thailoil focused on management with due regard for environmental, social, and governance (ESG) aspects in driving the organization under the Partner for Life strategy for transparent growth, focusing on equitable benefits of all stakeholders in parallel with sustainable stewardship of the environment and community happiness.

Thailoil and Subsidiaries assessed performance outcomes against Dow Jones Sustainability Indices (DJSI), a key indicator for the management of economic, social, and environmental aspects. For environmental management, Thailoil strived to maintain excellence in management and performance outcomes by operating under the scope of the five-year environmental master plan.

A Triple Bottom Line approach has been adopted by Thailoil and Subsidiaries to balance its management policy on society, environment, and economy. The five-year environmental master plan for 2017-2021, containing guidelines consistently adopted, was developed to respond to challenges demanded by key stakeholders, including higher expectations of communities and stakeholders, stringent actions of licensing authorities and law enforcers, Thailoil and Subsidiaries' business directions and plans, global sustainable development directives, and the desire to excel in environmental management. The environmental master plan leverages 58 years of work experience and includes nine various development facets.

1. Governance Structure

Thaioil and Subsidiaries continue to apply the environmental management approach of ISO 14001: 2015, incorporated with the Eco-Industry environmental framework, Global Reporting Initiative (GRI), DJSI, and ISO 26000 operation standard on CSR under the CSR-DIW initiative. These management approaches played a part in supporting Labix Co., Ltd. to receive Environmental Governance Award in 2019.

2. Technical Procedures

Thaioil and Subsidiaries have improved additional elements of Environmental Standard Specifications to scope its operation of construction projects to reduce environmental impacts and address regulations and all stakeholders' requirements and expectations. In 2019, under ESG management, Thaioil has developed guidelines and plans to control and mitigate process and expansion projects impacts on the environment including Monitoring IMO RFO Firing Guidelines, Green Construction Guidelines, and Traffic Management.

3. Climate Strategy

Natural resource conservation is of utmost importance to Thaioil and Subsidiaries, particularly fuels and energy, both of which represent key cost components for the environment and the economy. An Energy and Loss Committee (E&L) engages in energy management planning, monitoring and evaluation, and continuous improvement. The plan is to drive Thaioil and Subsidiaries to become one of Asia-Pacific top-quartile refineries, directly impacting global atmosphere due to the reduction of GHG emissions.

In 2019, TOP SPP Co., Ltd., joined and passed the assessment for Carbon Credit registration and

certification of 327,884 tons of carbon dioxide equivalent (tCO₂e) from Thailand Voluntary Emission Reduction (T-VER) for its Combined-Cycle Cogeneration Power Plant, which lowered the emission of GHGs as a result of power and steam cogeneration by using a clean fuel and world-class technology.

4. Water Resource Management

The systematic and cost-effective water resource management minimizes the risk of water shortage for production processes and avoids conflicts with local communities. This systematic management also provides auditable information on the volume and conditions of water supply to the public. In addition, Thaioil and Subsidiaries commanded business continuity management practices, which embraced the formulation and revision of water management plans in case of process water shortage. Thaioil and Subsidiaries together with PTT Group Water Committee (Eastern Region) and the Water War Room of the Eastern Region assessed risks and mapped out measures to cope with water shortage. Our desalination unit reduces water resource utilization and increases our long-term capability to manage water resources. This year, Thaioil has projects to increase our caliber and stability for water resource management, including a raw-water pipeline project and construction of a reservoir with a new pumping system. Thaioil also has a project to improve public drainage to manage flooding in the refinery area and overall terrain.

5. Eco-Efficiency Performance

In addition to our full compliance with preventive and mitigation measures and conditions stated in the Environmental Impact Assessment (EIA) report and

environmental regulatory controls and legislation, Thail and Subsidiaries have taken additional steps for their processes toward environmental quality.

>> Air Pollution – The management process covers the entire range of activities from the designing stage to maintenance planning, control of sulphur contents in fuels at sources, strategic selection of low-emission fuel instead of high-emission fuel, selection of clean equipment and process, selection of high-efficiency combustion technology with low nitrogen oxide emission, including Ultra-Low NO_x Burners and emission control, and constant detection of impurities. In 2019, projects were undertaken to mitigate environmental and community impacts under ESG management, including:

- Reviewing and identifying significant smell potential sources and defining measures on curbing smell impacts on communities.
- Executing Breathe The Better Project (PM 2.5 Crisis), leveraging the 4Cs-Control, Contain, Clean, and Check to mitigate environmental impacts at sources. Measures were taken to reduce dust in communities. Thail was one of the entities supporting government agencies' dust management.

>> Water Pollution – Under the highest efficient use of natural resource concept of 3Rs, the principle of wastewater treatment begins with reduction of wastewater quantities and segregation of waste right from the beginning. The principle ensures optimal use of natural resources and efficient treatment of waste water by continuously monitoring the Chemical Oxygen Demand (COD) in water around the clock.

>> Industrial Waste – The system begins with waste inventory, 3Rs of industrial waste, full control of waste storage, transport, and transfer for safe disposal. These processes are handled in line with both technical principles and regulatory controls. Thail and Subsidiaries are committed to zero industrial waste to landfill by 2020.

In addition, Thail and Subsidiaries also investigated and applied the Circular Economy to the business under the TOP Circular Economy Project to stress cost-effective resources utilization and minimize volumes of waste needing disposal so that the corporation can sustainably grow hand-in-hand with the environment and communities.

6. Biodiversity

As a corporate citizen responsible for the habitat and natural resources surrounding the refinery, Thail and Subsidiaries continuously develop monitoring mechanisms for environmental impacts, including ongoing studies on baseline and sensitive areas of the marine ecology. These studies have been fully integrated with existing assessment and tailor-made for specific uses on our prevention and mitigation.

7. Supplier and Contractor Program

Management of suppliers and contractors is crucial to the sustainable businesses of Thail and Subsidiaries, and demonstrates responsibility for society and the environment, recognizing that impacts could be caused by their business partners and contractors. Thail and Subsidiaries have, therefore, defined and developed practical socio-environmental guidelines for suppliers and contractors. All suppliers and contractors are encouraged to comply with the requirements of Thail and Subsidiaries and constantly participate in the All

SAFE White Green program together with the CSR-DIW initiative to demonstrate their responsibility to society. Together with Procurement and Contract Department, suppliers and contractors are urged to define framework and practices for all business partners to ensure guidelines for environmental management through the entire supply chain.

8. Environmental Audit

The implementation of environmental management (ISO 14001: 2015) scope and continuous improvement for years with no major corrective action (NC major = 0) was identified by the Thai Industrial Standards Institute (TISI). Thailoil and Subsidiaries are also pursuing its environmental management under the GRI guidelines, including audits, assurance, and sustainability development report, and certification of information on environmental operating performance and management for sustainability assessment under DJSI. Thailoil and Subsidiaries have developed a system to continuously compile and verify all internal data, reduce errors in data transmission, and increase data certification efficiency.

9. Management Information Solutions

Thailoil and Subsidiaries have been developing an Environmental Database Center to manage all environmental data. Such data includes air quality measurement, industrial waste management, incident management, and sustainability management. This year, the Company investigated and developed Pollutant Release and Transfer Registers (PRTR) under the guidelines developed by the Department of Industrial Works.

Environmental Education and Training for Employees

Thailoil and Subsidiaries have defined the code of conduct on communities, society, and the environment under the principle of “harmless activities to natural resources and the surroundings, and continuous nurturing among all employees the awareness of responsibility to society and the environment”. Under this commitment, Thailoil and Subsidiaries have clearly defined guidelines for education and training to employees on environmental conservation, and assigned the Quality Management Department to take charge of designing and developing the curricular, focusing on communication and knowledge sharing of the corporate environmental policy with all employees from day one during their orientation, especially to those in the operation including technicians, and engineers who are directly involved in environmental stewardship and conservation. These programs include STA1-Safety, Security and Environment in Refinery; QSHE Week activities under the All SAFE White Green strategy; in-house and external environmental training courses; specific environmental classes for managers, supervisors, and operators in charge of wastewater treatment systems, industrial waste, air pollution; and courses on energy and environmental conservation. Engineers directly responsible for each production unit attended more than 20 technical process training courses run by technology proprietors and vendors.



FUTURE PROJECTS

The investment strategies of Thailoil and Subsidiaries point toward sustainable growth and underlie the corporate vision, mission, and operating strategies. Therefore, Thailoil focuses on investment in **empowering human life through sustainable energy and chemicals**. Investment to raise its competitiveness has been made in businesses of the Company's expertise to increase product values while reducing risks in its core business through value chain enhancement. Thailoil's investment included expansion of production capacities, increase in efficiency and competitiveness, and introduction of new products to meet consumers' demand. Thailoil has extended its investment to countries with economic potential, such as ASEAN countries, to embrace new business opportunities. It also pays attention to logistical and infrastructural improvement as well as business model adjustment, while pursuing investments in new business and environmentally friendly business. Finally, it focuses on investment plans that fit dynamic market conditions to create maximum benefit for the Company and its stakeholders.

Ongoing Projects

Clean Fuel Project (CFP)

To improve production processes and raise competitiveness in response to higher market demands both in Thailand and countries in the ASEAN Economic Community, where imports of petroleum products continuously increase, Thailoil launched CFP to upgrade production processes to add higher values for environmentally-friendly products. This included construction of a refining unit that upgrading fuel oil to diesel and jet fuel, and capacity

expansion from 275,000 to 400,000 barrels per day to provide more operating flexibility. Through CFP, Thailoil is able to process a larger volume of oil and more diverse types of crude oil, thus producing economies of scale and lowering crude oil costs. CFP also benefits national energy security and helps drive the country's economy in a long term.

With an investment cost of around USD 4.825 billion, CFP is now under construction, and planned for the commercial operation in 2023. Concurrently, Thailoil has already sought investors in the Energy Recovery Unit (ERU) as approved in the 2019 Annual General Meeting of Shareholders to sell and transfer the ownership of ERU, which is part of CFP, with related agreements to Global Power Synergy Plc (GPSC) and its subsidiary, which established and wholly owned by GPSC. In May 2019, Thailoil signed an agreement with Energy Recovery Unit Co., Ltd. (a subsidiary wholly owned by GPSC), on the sale of ERU together with related agreements. ERU is currently under construction and planned for completion at the same time as CFP in 2023.

ERU sale has helpfully lowered CFP investment cost by around USD 757 million, thus keeping the investment cost within USD 4.174 billion.

Production of Euro 5 Standard Fuels

Under the government's policy to raise domestic fuel specifications to the Euro 5 standard with effect from January 1, 2024, Thailoil has started to make adjustment to its Hydrodesulphurization Unit to produce Euro 5 Standard fuel. The commercial operation is expected in time for the government mandate.



Site Preparation for CFP

Jetty Expansion Project

To ease traffic congestion around the port and enhance product distribution capacity, Thailoil launched a project to expand jetty 7 and 8 to accommodate product delivery of up to 50,000 deadweight tons (DWT) from the current capacity of 5,300 DWT. The project will provide greater flexibility and efficiency for product distribution, bringing about maximum customer benefit. The Jetty Expansion Project will also support distribution of new products to accommodate Thailoil and Subsidiaries' future business expansion. The project costs around THB 3.830 billion.

The Jetty Expansion Project is now under construction, and due for the commercial operation in Q1/2020.

Thailoil Sriracha Buildings Project

To ensure the optimal use of space on the refinery premises, the increase in safety for workers as well as the readiness for future business expansion, Thailoil is set for the relocation of its office buildings, product testing laboratories and R&D building, engineering office, and warehouse from the production site. The new facility requires an investment cost of around THB 2.740 billion.

Construction of the engineering buildings and warehouse as well as product testing laboratories and R&D building has now been completed and opened for operation. Construction of office buildings are still underway, and expected to be ready for operation in Q1/2020.

Corporate Venture Capital (CVC) through TOP Ventures

Following the approval of Thailoil's Board of Directors for the establishment of a unit to take charge of investments in the form of Corporate Venture Capital (CVC), a step out strategy to search for new business opportunities and expansion into new S-Curve businesses for Thailoil and Subsidiaries. This newly established unit focuses on 1) Manufacturing Technology, 2) Green and Human Technology and 3) Hydrocarbon Disruption Technology.

In 2019, Thailoil succeeded in its investment in funds that involved Manufacturing Technology to enhance production and management competitiveness, which addressed all of its target industries mentioned above. Thailoil is now mulling over the expansion of the investment.



TOP Crude Oil Tank



Thaoil Sriracha Buildings Project

Projects under Feasibility Studies

Electricity and Steam Production in Sriracha

As the power purchase agreement (SPP-PPA) under Thaioil Power Co, Ltd., is to expire in 2023, Thaioil and Subsidiaries have carried out a study on the feasibility of constructing an electricity and steam production unit to replace the power plant. This would ensure supply stability of electricity and steam in Thaioil refinery premises.

Investment in Petrochemical Business

To expand Thaioil and Subsidiaries' value chain, Thaioil together with PTT Group conducted a feasibility study on the investment in the petrochemical business to enhance mutual benefit. The initial study has already been completed and that on suitable investment options is underway. It is expected to reach a conclusion by Q2/2020.

Expansion of Solvent and Chemical Production

TOP Solvent Co., Ltd. is aiming to increase its sales volumes while safeguarding its share in the domestic solvent and chemicals market. Its focus is placed on expanding the customer base to new target countries in Southeast Asia, where high economic growth is observed, through joint ventures and acquisitions. The cooperation with allied producers would also benefit product diversity to better respond to customers' demand, emphasizing on the increase in high-value product proportion.

Specialty Products

Thaioil has drawn up a strategic plan and carried out studies on product development to add value to and move away from commodity products to specialty products, both light-end and heavy-end, which can serve new groups of downstream customers with specific demands including food industry, pharmaceuticals,

cosmetics, solvents, rubber products, and cleaning agents.

Thaioil Marine's Fleet Expansion

Thaioil Marine Co., Ltd. strives to become the leader of large-vessel fleets for PTT Group and Asia-Pacific, to support expansion of energy, petroleum, and petrochemical markets, both domestically and internationally. The plan is to reshape the business structure and business model, and expand the fleet to meet the demand of PTT Group and business partners. This would support Thaioil's endeavor to step out to emerging overseas markets and serve as a vital platform for future business growth of both Thaioil and Subsidiaries and PTT Group.

Investment in Green Business

To keep up the momentum of sustainable business, Thaioil and PTT Group jointly conducted a study on the expansion of bio-based businesses and renewable energy in addition to other green businesses to strike a sustainable balance among financial returns, value creation, and support greenhouse gas reduction to consequently lower environmental impacts. Thaioil plans to conduct further studies with business partners to accelerate its investment in the green business.

Other Business Opportunities

Under the current competitive environment, business expansion and new business development in line with industrial megatrends and technological evolution have become essential to bolster Thaioil's competitiveness, particularly in future energy consumption. Therefore, it is crucial for Thaioil to study and identify investment potential in domestic and international markets. The plan includes identification of joint ventures and mergers and acquisitions (M&As), with an emphasis on businesses with synergistic opportunities, value addition to existing structures, and strengthening of Thaioil's business value chain to attain sustainable business leadership.

HUMAN RESOURCES AND ORGANIZATION DEVELOPMENT



Thaioil and Subsidiaries are convinced that qualified employees are instrumental to success and uphold its commitment of “Refining Values”. The Company has constantly developed and improved human resource management system to ensure its efficiency. We prioritize the development of modern and efficient human resource management system in line with changing business contexts by securing and developing employees to be competent, conscientious, with organizational awareness and engagement. Once these are accomplished, employees will become a vital force driving the organization toward a High-Performance Organization (HPO) with sustainable growth.

Amid business challenges and prevailing contexts of 2019, Thaioil and Subsidiaries persisted in developing human resources in their capacity and capability through continuous projects and, in parallel, promoted their well-being in a systematic manner to accommodate future business growth. Existing staff and new recruits have been prepared for the Clean Fuel Project (CFP). The application of technology, such as the automation recruitment process, was stressed to create new experience for them. The employee selection and recruitment efficiency were developed to support global recruitment in response to international labor migration through cooperation with educational institutes to inspire

and create candidates' experience. A lean recruitment process was also a part of this development. Moreover, Thailoil and Subsidiaries have tried to create employer branding among target groups, both internal and external. As a result, Thailoil and Subsidiaries nominated 94% of the recruitment target under the plan to support CFP project implementation.

Thailoil and Subsidiaries have adopted an international HR system with certified standards for CFP staff due to be posted abroad. Over 2019, overseas postings were completely arranged as planned. Moreover, to support growth in refining capacity through value chain enhancement under the international M&A strategy, Thailoil efficiently developed as planned a standardized HR management plan which is precise and suitable for the business contexts of Thailoil and Subsidiaries. The plan includes organization structure design, people management system, and staff mobilization, all of which have been effectively implemented as projected. Moreover, Thailoil stressed staff competence and ability to accommodate and respond to the organization's future strategy, leveraging the Workforce Productivity Improvement program. Therefore, Thailoil managed to improve staff's operational efficiency and effectiveness in all departments as planned.

Thailoil continues to regard its employees as the most precious resource, thus establishing a continuous staff development plan aligning with the business strategy as detailed below:

1. Elevate employees' continued learning experience from hire to retire through projects called AGILE Lifelong Learning Experience, which applies digital technology to provide assorted advanced learning media to cope with different needs of different generations. The details are as follows:

A (Attract) — to attract and motivate high-potential candidates to join the organization through granting academic scholarships to students and cooperating with academic institutions on technical knowledge transfer

A (Adapt) — to assist new employees to adapt themselves and efficiently start their work through basic knowledge creating and corporate culture learning

G (Groom) — to elevate employees' competencies and promote better performance through the GREAT and DANCE⁺ development packages and academic scholarships

I (Inspire) — to enhance competencies of employees with high potential and leadership to be prepared for business growth through intense development, including Dynamic Career Management, Mobility Development, and GREAT Leader Development

L (Lifelong Learning) — to create learning experience for employees to feel they are an essential part of the organization and create sustainable employee engagement through Digital Learning Platform and Mindful Development Program

E (Exit) — to deliver core values and pass on Thailoil's good impressions to employees (Employee Value Propositions) through Gen-2-Gen Knowledge Transfer and employees' well-being development in preparation for retirement.

2. Develop a learning involving process technologies to enhance staff competency in response to business direction by using tools and technological media that are fun and quick to learn, such as TOP Academy, an Online Learning Program. Currently, 494 courses on general topics and 35 Micro-Learning courses on

special topics have been designed and developed. AR Learning and Gamification have also been embraced as part of staff training to accommodate staff to access knowledge at any place and any time.

3. Enhance staff competence in the digital era by valuing innovation and new ideas, Thailoil organized an Idea Challenge Contest, where staff can present new ideas through experience and knowledge-sharing with experts in the form of 70:20:10 Learning Methodology ⁽¹⁾ - a standard for continuous learning and development.
4. Cultivate high-potential staff to ensure enough competency to be timely utilized for new businesses in the future, by implementing Dynamic Career Management Program. During 2019, Thailoil managed to develop 15 such high-potential staff (100%) as planned.

Regarding employees' well-being, Thailoil and Subsidiaries have arranged projects and activities that cover four aspects of life: namely, physical, mental, financial, and social aspects. Some are health promotion through TOP Well-being Application, which encourages staff to exercise by running while fostering relations and teamwork with colleagues; Emotional Intelligence Leader Project, which was initiated to strengthen and elevate employees' spirit; and Collaboration Application (PLAY Application), a communication channel to enhance cooperation within the organization and strengthen employee engagement. A financial planning program has also been designed for different age groups, from recruitment to retirement.

As a concrete result of HR management, Thailoil earned 2019 Thailand Corporate Excellence Awards in the field

of Human Resource Management Excellence from the Thailand Management Association. This prestigious award confirms Thailoil's HR management efficiency.

For 2020, many challenges are continuously foreseen including the challenges from labor market competition to win high-caliber personnel, which has been more and more series, the changes in required skills to ensure the organization's competitiveness and the achievement of business objectives, and the needs to acquire a high number of quality personnel to accommodate future business expansion and replace retiring ones in the next decade. These are pressing factors for adjustment and for staff development in various areas. To overcome these challenges, Thailoil and Subsidiaries have drawn up a People & Organization Strategy for 2020, which mainly involves:

1. Preparing the organization structure and workforce design for business expansion under the Value Chain Enhancement strategy through the Workforce Productivity Improvement Project. To this end, Thailoil has outlined the business structure and workforce design for olefins and aromatics projects to uphold workforce productivity under the Workforce Productivity Initiative. In search of new opportunities for innovation business, Thailoil has seeded its options through projects for the readiness of HR management system in various aspects: namely, the organization structure, career path development, staff competency development, compensation and welfare, performance assessment, etc.
2. Grooming the workforce for core knowledge and competencies through core projects such as GREAT Mindset ⁽²⁾ where positive attitude, flexibility, and

confidence in one's capability are emphasized for staff, leading to the willingness to play a part in determinedly driving the organization toward its goal; DANCE⁺ Development⁽³⁾, a program to get staff ready with higher capability for business expansion in the digital era; a personnel development plan from recruitment to retirement; enhancement of staff's knowledge and skills required for future business; a program for high-potential staff; support for self-learning; exchange to extend experience and information in support of strategic business expansion; and staff development through the Digital Platform to enhance participative learning and experience building through digital learning on mobile phone and websites.

3. Elevating staff's quality of life in all four aspects (physical, mental, financial, and social) through the Well-being @ TOP Project, to create work-life balance

and engagement with the organization. The Projects include Flexible Benefits, under which staff can switch welfare items that do not suit their lifestyles with those more suitable; Health Meter, a medical software program to forecast illness risk and suitable health advice; development of communication channels among staff to enhance information sharing; Connect and Collaborate, staff grouping via social media according to their interests to enhance staff relationship and a sense of belonging to the Thailoil family; and health promotion through various activities and well-being application; development of Chat Bot (Rhino Bot) to accommodate the young-generation staff who prefer mobile application for accessing information and benefits; Mental Well-being to foster awareness of mental health care through stress relief programs; and the i-TOP⁺⁽⁴⁾ to boost values concerning innovation and digitalization to be prepared for strategic changes of future business.

Remarks:

⁽¹⁾ 70 : 20 : 10 : Method of development consisting of learning through experience 70%, exposure 20%, and study 10%
Learning Methodology

⁽²⁾ GREAT Mindset : Set of competency for developing leadership of Thailoil and Subsidiaries, consisting of Goal Achievement, Relationship and Result, Expert and Execution, Attribute, and Transformation and Change

⁽³⁾ DANCE⁺ Development : Set of competency for supporting business expansion, consisting of Diversity, Adaptability, Negotiation, Collective Leader, and Execution

⁽⁴⁾ i - TOP⁺ : Value selected from Thailoil and Subsidiaries' core values to address business expansion, consisting of Integrity, Teamwork and Collaboration, Professionalism, and Innovation and Digitalization

BOARD OF DIRECTORS

PROFESSOR DR. THOSAPORN SIRISUMPHAND

Director (Non-Executive)
and Chairman of the Board
Age 59 Yrs.



Director Term Duration

- >> Independent Director (Non-Executive) (Appointed on May 25, 2012: 2 years 11 months)
- >> Independent Director (Non-Executive) (Re-elected on April 3, 2015: 3 years)
- >> Chairman of the Board and Independent Director (Non-Executive) (Elected on April 7, 2017: 1 year and Re-elected on April 11, 2018: 4 months)
- >> Chairman of the Board and Director (Non-Executive) (Since August 23, 2018: 1 year 4 months)

Board-Committee Term Duration

- >> Member of the Corporate Governance Committee (Appointed on June 22, 2012 and completed the term in the 2015 Annual General Meeting of Shareholders: 2 years 10 months)
- >> Chairman of the Corporate Governance Committee (Elected on August 31, 2013 and completed the term in the 2015 Annual General Meeting of Shareholders: 1 year 8 months)
- >> Member of the Nomination and Remuneration Committee (Appointed on September 26, 2014 and completed the term in the 2015 Annual General Meeting of Shareholders: 7 months)
- >> Member of the Nomination and Remuneration Committee (Appointed on April 24, 2015: 2 years)
- >> Member of the Corporate Governance Committee (Appointed on April 24, 2015: 2 years)
- >> Chairman of the Corporate Governance Committee (Elected on July 22, 2015 and resigned from the Position of Chairman of the Corporate Governance Committee on August 19, 2016: 1 year 1 month)
- >> Chairman of the Nomination and Remuneration Committee (Elected on April 19, 2016: 1 year)
- >> Board-Committee Directorship (Member of the Corporate Governance Committee and Chairman of the Nomination and Remuneration Committee) ends since being elected as the Chairman of the Board (April 7, 2017)

Education

- >> Bachelor of Public Administration (Honors), Chulalongkorn University
- >> Master of Public Administration, Pi Alpha Alpha (National Honor Society for Public Affairs and Administration), Northern Illinois University, USA
- >> Ph.D. in Policy Analysis, Public Administration and Comparative Politics, Northern Illinois University, USA

Director Training Courses of Thai Institute of Directors Association (IOD)

- >> Director Certification Program (DCP 80/2006)
- >> Finance for Non-Finance Directors (FND 30/2006)
- >> Director Certification Program Update (DCPU 4/2015)

Other Trainings

- >> Capital Market Academy Leader Program, Class 10, Capital Market Academy
- >> The Programme for Senior Executives on Justice Administration, Batch 15, Judicial Training Institute, National Justice Academy
- >> The Executive Program in Energy Literacy for a Sustainable Future, Class 4, Thailand Energy Academy
- >> Corporate Governance: Effectiveness and Accountability in the Boardroom 2014, Kellogg School of Management, Northwestern University, USA
- >> Chairman Forum: "The Role of Chairman in Leading Strategic Risk Oversight"
- >> Global Anti-corruption and Integrity Forum 2018, OECD, Paris, France
- >> Seminar: "How to Transform Your Business to Become an Exponential Company in a Digital Era", Faculty of Commerce and Accountancy, Chulalongkorn University

Working Experience in the 5 Preceding Years

| | |
|-------------------------|---|
| 2013 - 2014 | Secretary General, the Higher Education Commission |
| 2014 - Sep 2016 | Advisor, Prime Minister's Office |
| Oct 2016 - Jun 28, 2018 | Secretary General, the Public Sector Development Commission |
| Jun 29, 2018 - Present | Secretary General, the National Economic and Social Development Council |

Current Positions

1. Listed Company (1)

- >> Director and Chairman of the Board, Thai Oil Plc

2. Public Company

- None -

3. Limited Company

- None -

4. Other Organizations/Institutions (4)

- >> Director and Chairman of Corporate Governance Committee, the Bank of Thailand
- >> Member of Chulalongkorn University Council
- >> Director, Creative Economy Agency (Public Organization)
- >> Member of Council of State

5. State Enterprise (1)

- >> Chairman of the Board, Tourism Authority of Thailand

% of Shareholding in Thaioil

- None -

Conflict of Interest

- None -

Family Relation with Other Directors

- None -

Dispute in the 10 Preceding Years

- None -

MR. KANIT SI

Independent Director (Non-Executive)
and Chairman of the Audit Committee
Age 69 Yrs.



Director Term Duration

- >> Independent Director (Non-Executive) (Appointed on January 26, 2018 and effective from February 1, 2018: 1 year 2 months)
- >> Independent Director (Non-Executive) (Re-elected on April 10, 2019: 8 months)

Board-Committee Term Duration

- >> Member of the Corporate Governance Committee
(Appointed on April 27, 2018 and completed the term in the 2019 Annual General Meeting of Shareholders: 1 year)
- >> Member of the Corporate Governance Committee
(Appointed on May 31, 2019 and vacated on September 20, 2019: 3 months)
- >> Member of the Audit Committee
(Appointed on August 30, 2019 and effective from September 20, 2019: 3 months)
- >> Chairman of the Audit Committee (Elected on September 20, 2019: 3 months)

Education

- >> Bachelor of Engineering (Gold Medal), Chulalongkorn University
- >> Master of Business Administration (Finance and Quantitative Method), University of New Orleans, USA

Director Training Courses of Thai Institute of Directors Association (IOD)

- >> Director Certification Program (DCP 28/2003)
- >> Finance for Non-Finance Directors (FND 5/2003)
- >> Ethical Leadership Program (ELP 16/2019)
- >> Advanced Audit Committee Program (AACP 35/2019)

Other Trainings

- >> Capital Market Academy Leader Program, Class 9, Capital Market Academy
- >> The Executive Program in Energy Literacy for a Sustainable Future, Class 12, Thailand Energy Academy
- >> Global Leadership Development Program (GLDP), International Centre of Leader in Finance (ICLIF) 2004
- >> 2018 PTIT Special Lecture: "The Dawn of a New Energy Era & The Transition to High Noon"
- >> Audit Committee Forum: "Strategic Audit Committee: Beyond Figure and Compliance"

Working Experience in the 5 Preceding Years

1995 - Present Senior Executive Vice President, Bangkok Bank Plc

Current Positions

1. Listed Company (3)

- >> Independent Director and Chairman of the Audit Committee, Thai Oil Plc
- >> Senior Executive Vice President, Bangkok Bank Plc
- >> Independent Director, Member of the Nomination, Compensation and Corporate Governance Committee and Member of the Sustainability and the Risk Management Committee, Indorama Ventures Plc

2. Public Company (2)

- >> Director, Indorama Polyester Industries Plc
- >> Director, TPT Petrochemicals Plc

3. Limited Company (1)

- >> Director, HMC Polymers Co., Ltd.

4. Other Organizations/Institutions

- None -

5. State Enterprise

- None -

% of Shareholding in Thailoil (By Spouse)

20,000 shares
equivalent to 0.00098%

Conflict of Interest

- None -

Family Relation with Other Directors

- None -

Dispute in the 10 Preceding Years

- None -

MS. CHULARAT SUTEETHORN

Director (Non-Executive)
and Member of the Risk Management Committee
Age 65 Yrs.

**Director Term Duration**

- >> Independent Director (Non-Executive) (Appointed on September 20, 2013: 1 year 7 months)
- >> Independent Director (Non-Executive) (Re-elected on April 3, 2015: 3 years)
- >> Independent Director (Non-Executive) (Re-elected on April 11, 2018: 1 year 5 months)
- >> Director (Non-Executive) (September 20, 2019: 3 months)

Board-Committee Term Duration

- >> Member of the Audit Committee (Appointed on September 20, 2013 and completed the term in the 2015 Annual General Meeting of Shareholders: 1 year 7 months)
- >> Member of the Audit Committee (Appointed on April 24, 2015 and completed the term in the 2018 Annual General Meeting of Shareholders: 3 years)
- >> Chairman of the Audit Committee (Elected on February 12, 2016 and completed the term in the 2018 Annual General Meeting of Shareholders: 2 years 2 months)
- >> Member of the Nomination and Remuneration Committee (Appointed on April 27, 2016 and completed the term in the 2018 Annual General Meeting of Shareholders: 2 years)
- >> Member of the Nomination and Remuneration Committee (Appointed on April 11, 2018 and vacated on September 20, 2019: 1 year 5 months)
- >> Member of the Audit Committee (Appointed on April 27, 2018 and vacated on September 20, 2019: 1 year 5 months)
- >> Chairman of the Audit Committee (Elected on May 10, 2018 and vacated on September 20, 2019: 1 year 4 months)
- >> Member of the Risk Management Committee (Appointed on August 30, 2019 and effective from September 20, 2019: 3 months)

Education

- >> Bachelor of Economics (Banking and Finance) (2nd Class Honors), Kasetsart University
- >> Master of Development Studies (Economic Policy and Planning), Institute of Social Studies, The Netherlands

Director Training Courses of Thai Institute of Directors Association (IOD)

- >> Director Accreditation Program (DAP 40/2005)
- >> Director Certification Program (DCP 72/2006)
- >> Finance for Non-Finance Directors (FND 28/2006)
- >> Financial Statements for Directors (FSD 10/2010)
- >> Audit Committee Program (ACP 39/2012)
- >> Role of the Chairman Program (RCP 28/2012)
- >> Financial Institutions Governance Program (FGP 4/2012)
- >> Role of the Nomination and Governance Committee (RNG 3/2012)
- >> Anti-Corruption for Executive Program (ACEP 10/2014)
- >> Advanced Audit Committee Program (AACP 15/2014)
- >> Director Certification Program Update (DCPU 4/2015)
- >> Role of the Compensation Committee (RCC 20/2015)
- >> Ethical Leadership Program (ELP 7/2017)
- >> Board Nomination and Compensation Program (BNCP 1/2017)
- >> Board Matters and Trends (BMT 6/2018)

Other Trainings

- >> Civil Service Executive Program: Visionary and Moral Leadership, Class 41, Office of the Civil Service Commission
- >> Training in Development Assistance, Canada
- >> Training course on Administrative Court and its Procedures Matter, The Administrative Court
- >> Strategic Thinking and Executive Action, Kellogg Executive Program, Northwestern University, USA
- >> The Joint State-Private Sector Course, Class 19, National Defence College
- >> Advanced Security Management Program, Class 1, National Defence College
- >> Capital Market Academy Leader Program, Class 12, Capital Market Academy
- >> Top Executive Program in Commerce and Trade (TEPCoT), Class 5, Commerce Academy, University of the Thai Chamber of Commerce
- >> The Executive Program in Energy Literacy for a Sustainable Future, Class 3, Thailand Energy Academy
- >> Thammasat Leadership Program, Class 4, Thammasat University
- >> Advanced Certificate Course in Politics and Governance in Democratic Systems for Executives, Class 18, King Prajadhipok's Institute
- >> Training Course on Good Governance for Directors and Executives of State-Owned Enterprises and Public Organization, Class 11, King Prajadhipok's Institute
- >> Audit Committee Seminar-Get Ready for the Year End
- >> Seminar "PTT Group AC Forum 2017: Infinite AC Challenge"
- >> Lecture "Resource Revolution: Another Chapter in the 4th Industrial Revolution"

- >> Seminar: "Key Audit Matters"
- >> Seminar: EY Center for Board Matters Seminar in topic
"Top Priorities in Digitalization: The Next Move"
- >> 2018 PTIT Special Lecture: "The Dawn of a New Energy Era &
The Transition to High Noon"
- >> Independent Director Forum 1/2019: "Tips and Tricks for Dealing with
Questions in AGM"
- >> IOD National Director Conference 2019: "Board of the Future"
- >> Thailand Insurance Leadership Program, Class 9,
Office of Insurance Commission

Working Experience in the 5 Preceding Years

- 2010 - 2014 Director and Chairman of the Investment Committee,
Deposit Protection Agency
- 2011 - 2014 Executive Director, Thailand Tobacco Monopoly
- 2012 - 2014 Director, Chairman of the Risk Management Committee,
and Member of the Corporate Governance,
the Government Savings Bank
- 2012 - 2014 Director-General, Public Debt Management Office,
Ministry of Finance
- 2014 - 2015 Vice Minister for Finance, Ministry of Finance

Current Positions

1. Listed Company (2)

- >> Director and Member of the Risk Management Committee, Thai Oil Plc
- >> Director, MFC Asset Management Plc

2. Public Company

- None -

3. Limited Company (1)

- >> Independent Director, D.T.C. Enterprise Co., Ltd.

4. Other Organizations/Institutions (2)

- >> Chairman of the Board, Neighbouring Countries Economic Development
Cooperation Agency (Public Organization)
- >> Member of the Insurance Commission by Expertise (Economics)

5. State Enterprise

- None -

% of Shareholding in Thailoil 10,000 shares
equivalent to 0.00049%

Conflict of Interest - None -

Family Relation with Other Directors - None -

Dispute in the 10 Preceding Years - None -

ASSOCIATE PROFESSOR DR. PASU DECHARIN

Independent Director (Non-Executive),
Member of the Audit Committee
and Member of the Nomination and Remuneration Committee
Age 51 Yrs.

**Director Term Duration**

>> Independent Director (Non-Executive) (Elected on April 11, 2018:
1 year 8 months)

Board-Committee Term Duration

>> Member of the Audit Committee (Appointed on April 27, 2018: 1 year 8 months)
>> Member of the Nomination and Remuneration Committee
(Appointed on August 30, 2019 and effective from September 20, 2019:
3 months)

Education

>> Bachelor of Business Administration (Management),
Faculty of Commerce and Accountancy, Chulalongkorn University
>> Master of Business Administration (General Management),
University of Colorado (Boulder), USA
>> Ph.d. in Management of Technology,
School of Management, Asian Institute of Technology

Director Training Courses of Thai Institute of Directors Association (IOD)

>> Director Accreditation Program (DAP 121/2015)
>> Director Certification Program (DCP 280/2019)

Other Trainings

>> Executive Development Program (EDP), Class 3,
Thai Listed Companies Association (TLCA)
>> Leadership Development Program (LDP), Class 6,
Thai Listed Companies Association (TLCA)
>> Audit Committee Forum: "Strategic Audit Committee:
Beyond Figure and Compliance"

Working Experience in the 5 Preceding Years

1993 - Present Lecturer, Faculty of Commerce and Accountancy,
Chulalongkorn University
2011 - Mar 2019 Dean, Faculty of Commerce and Accountancy,
Chulalongkorn University

Current Positions**1. Listed Company (3)**

>> Independent Director, Member of the Audit Committee
and Member of the Nomination and Remuneration Committee, Thai Oil Plc
>> Independent Director, Member of the Audit Committee
and Member of the Risk Oversight Committee, Siam Commercial Bank Plc
>> Independent Director, Member of the Audit Committee
and Member of the Governance and Nomination Committee,
Siam Cement Plc

2. Public Company (1)

>> Independent Director, Aksorn Education Plc

3. Limited Company (1)

>> Independent Director and Chairman of the Board, Warrix Sports Co., Ltd.

4. Other Organizations/Institutions (1)

>> Director, AUA Language Center

5. State Enterprise

- None -

% of Shareholding in Thaioil

- None -

Conflict of Interest

- None -

Family Relation with Other Directors

- None -

Dispute in the 10 Preceding Years

- None -

MR. PRAPHAISITH TANKEYURA

Independent Director (Non-Executive)
and Member of the Audit Committee
Age 64 Yrs.



Director Term Duration

>> Independent Director (Non-Executive) (Appointed on August 30, 2019
and effective from September 1, 2019: 4 months)

Board-Committee Term Duration

>> Member of the Audit Committee (Appointed on August 30, 2019
and effective from September 20, 2019: 4 months)

Education

>> Bachelor of Statistics (Applied Statistics for Business),
Faculty of Commerce and Accountancy, Chulalongkorn University
>> Master of Business Administration (Finance), Florida State University, USA

Director Training Courses of Thai Institute of Directors Association (IOD)

>> Director Certification Program (DCP 249/2017)
>> Advanced Audit Committee Program (AACP 29/2018)
>> Role of the Chairman Program (RCP 43/2018)
>> Board Matters and Trends (BMT 7/2019)
>> Board Nomination and Compensation Program (BNCP 7/2019)

Other Trainings

>> Cyber Resilience Leadership, Class 3/6, Bank of Thailand
>> Corporate Governance for Directors and Senior Executives of Regulator,
State Enterprises and Public Organizations, Class 18,
King Prajadhipok's Institute

Working Experience in the 5 Preceding Years

2012 - 2018 Director and Chief Executive Officer,
Maboonyong Real Estate Co., Ltd.
2005 - Present Managing Director, Boathouse Hua Hin Co., Ltd.
2014 - Present Chairman of Advisory Board, JWS Construction Co., Ltd

Current Positions

1. Listed Company (2)

>> Independent Director and Member of the Audit Committee, Thai Oil Plc
>> Independent Director, Chairman of the Audit Committee,
Corporate Governance and Corporate Social Responsibilities,
and Member of Nomination and Remuneration Committee,
Krungthai Card Plc

2. Public Company

- None -

3. Limited Company (1)

>> Governor Performance Evaluation Subcommittee,
Islamic Bank Asset Management Co., Ltd.

4. Other Organizations/Institutions

- None -

5. State Enterprise

- None -

% of Shareholding in Thailoil

- None -

Conflict of Interest

- None -

Family Relation with Other Directors

- None -

Dispute in the 10 Preceding Years

- None -

AIR CHIEF MARSHAL SUTTIPONG INSEYONG

Independent Director (Non-Executive)
and Chairman of the Nomination and Remuneration Committee
Age 62 Yrs.

**Director Term Duration**

- >> Independent Director (Non-Executive)
(Appointed on January 22, 2016 and effective from February 1, 2016:
1 year 2 months)
- >> Independent Director (Non-Executive) (Re-elected on April 7, 2017:
2 years 8 months)

Board-Committee Term Duration

- >> Member of the Corporate Governance Committee (Appointed on April 27, 2016 and completed the term in the 2017 Annual General Meeting of Shareholders: 1 year)
- >> Chairman of the Corporate Governance Committee (Elected on November 21, 2016 and completed the term in the 2017 Annual General Meeting of Shareholders: 5 months)
- >> Member of the Nomination and Remuneration Committee
(Appointed on April 28, 2017: 2 years 8 months)
- >> Chairman of the Nomination and Remuneration Committee
(Elected on May 17, 2017: 2 years 7 months)

Education

- >> Bachelor of Science in Aeronautical Engineering,
The Royal Thai Air Force Academy
- >> Bachelor of Political Science Program in International Relations
and Comparative Government and Politics,
Sukhothai Thammathirat Open University

Director Training Courses of Thai Institute of Directors Association (IOD)

- >> Director Accreditation Program (DAP 114/2015)
- >> Financial Statements for Directors (FSD 37/2018)
- >> Advanced Audit Committee Program (AACP 31/2018)
- >> Director Certification Program (DCP 267/2018)

Other Trainings

- >> Pilot Training Course, Flying Training School, The Royal Thai Air Force
- >> Flight Safety Course, The Royal Thai Air Force
- >> Air Command and Staff College Course, The Royal Thai Air Force
- >> Air War Course, The Royal Thai Air Force
- >> National Defence Course, Class 52, National Defence College
- >> The Executive Program in Energy Literacy for a Sustainable Future, Class 13, Thailand Energy Academy
- >> Advanced Master of Management (AMM), Class 3, Graduate School of Public Administration, National Institute of Development Administration
- >> Independent Director Forum 1/2019: "Tips and Tricks for Dealing with Questions in AGM"

Working Experience in the 5 Preceding Years

- Oct 2013 - Sep 2014 Assistant Chief of the Air Staff for Operations,
The Royal Thai Air Force
- Oct 2014 - Sep 2015 Deputy Chief of the Air Staff for Operations,
The Royal Thai Air Force
- Oct 2015 - Sep 2016 Commander of Directorate of Air Operations Control,
The Royal Thai Air Force
- Oct 2016 - Sep 2017 Assistant Commander-in-Chief,
The Royal Thai Air Force
- Oct 2017 - Sep 2018 Deputy Chief of Defence Forces,
The Royal Thai Armed Forces

Current Positions

1. Listed Company (1)
 - >> Independent Director and Chairman of the Nomination and Remuneration Committee, Thai Oil Plc
 2. Public Company - None -
 3. Limited Company - None -
 4. Other Organizations/Institutions (1)
 - >> Military Supreme Court
 5. State Enterprise - None -
- % of Shareholding in Thaioil - None -
- Conflict of Interest - None -
- Family Relation with Other Directors - None -
- Dispute in the 10 Preceding Years - None -

MR. AUTTAPOL RERKPIBOON

Director (Non-Executive),
Chairman of the Risk Management Committee
and Member of the Nomination and Remuneration Committee
Age 54 Yrs.



Director Term Duration

- >> Director (Non-Executive) (Elected on April 11, 2018: 1 year)
- >> Director (Non-Executive) (Re-elected on April 10, 2019: 8 months)

Board-Committee Term Duration

- >> Member of the Nomination and Remuneration Committee
(Appointed on September 28, 2018, effective from October 1, 2018
and completed the term in the 2019 Annual General Meeting of Shareholders:
6 months)
- >> Member of the Risk Management Committee (Appointed on September 28,
2018, effective from October 1, 2018 and completed the term in the 2019
Annual General Meeting of Shareholders: 6 months)
- >> Chairman of the Risk Management Committee (Elected on October 11, 2018
and completed the term in the 2019 Annual General Meeting of
Shareholders: 6 months)
- >> Member of the Nomination and Remuneration Committee
(Appointed on May 31, 2019: 6 months)
- >> Member of the Risk Management Committee (Appointed on May 31, 2019:
6 months)
- >> Chairman of the Risk Management Committee (Elected on June 11, 2019:
6 months)

Education

- >> Bachelor of Engineering (Civil Engineering), Chulalongkorn University
- >> Master of Economics Program, National Institute of Development Administration
- >> Diploma of Petroleum Management, College of Petroleum Studies,
Oxford University, United Kingdom (British Council Scholarship)

Director Training Courses of Thai Institute of Directors Association (IOD)

- >> Company Secretary Program (CSP 14/2005)
- >> Director Certification Program (DCP 173/2013)

Other Trainings

- >> Executive Development Program (EDP), Class 1,
Thai Listed Companies Association (TLCA)
- >> National Defence Course, Class 58, National Defence College
- >> Advanced Certificate Course in Politics and Governance in
Democratic Systems for Executives, Class 14, King Prajadhipok's Institute
- >> Capital Market Academy Leader Program, Class 20, Capital Market Academy
- >> The Executive Program in Energy Literacy for a Sustainable Future, Class 12,
Thailand Energy Academy
- >> TIJ Executive Program on Rule of Law and Development (RoLD), Class 2
- >> NIDA-Wharton Executive Leadership Program 2009,
The Wharton School, University of Pennsylvania, USA
- >> PTT Executive Leadership Program, General Electric, New York, USA

Working Experience in the 5 Preceding Years

- | | |
|---------------------|---|
| Nov 2013 - Sep 2014 | Executive Vice President, Retail Marketing, PTT Plc |
| Oct 2014 - Sep 2015 | Senior Executive Vice President, Sustainability Management and Project Engineering, PTT Plc |
| Oct 2015 - Sep 2017 | Senior Executive Vice President, Oil Business Unit, PTT Plc |
| Oct 2017 - Present | Chief Operating Officer, Downstream Petroleum Business Group, PTT Plc |

Current Positions

1. Listed Company (2)

- >> Director, Chairman of the Risk Management Committee,
and Member of the Nomination and Remuneration Committee, Thai Oil Plc
- >> Chief Operating Officer, Downstream Petroleum Business Group, PTT Plc

2. Public Company (1)

- >> Director and Chairman of the Board, PTT Oil and Retail Business Plc

3. Limited Company (1)

- >> Director and Chairman of the Board, PTT Tank Terminal Co., Ltd.

4. Other Organizations/Institutions (1)

- >> Member of Payment Systems Committee, Bank of Thailand

5. State Enterprise

- None -

% of Shareholding in Thailoil

- None -

Conflict of Interest

- None -

Family Relation with Other Directors

- None -

Dispute in the 10 Preceding Years

- None -

POLICE GENERAL AEK ANGSAANANT

Independent Director (Non-Executive)

and Chairman of the Corporate Governance Committee

Age 64 Yrs.

**Director Term Duration**

>> Independent Director (Non-Executive) (Elected on April 7, 2017: 2 years 8 months)

Board-Committee Term Duration

- >> Member of the Corporate Governance Committee
(Appointed on May 26, 2017: 2 years 7 months)
- >> Chairman of the Corporate Governance Committee
(Elected on June 21, 2017: 2 years 6 months)

Education

- >> Bachelor of Law (1st Class Honor), Ramkhamhaeng University
- >> Master of Law, Chulalongkorn University
- >> Barrister-at-Law, The Institute of Legal Education, Thai Bar Association
- >> Certificate of Senior Police Command, Police College Bramshill, United Kingdom

Director Training Courses of Thai Institute of Directors Association (IOD)

- >> Director Certification Program (DCP 111/2008)
- >> Board Matters and Trends (BMT 4/2017)
- >> Role of the Chairman Program (RCP 42/2018)
- >> Ethical Leadership Program (ELP 16/2019)
- >> Corporate Governance for Capital Market Intermediaries (CGI 22/2019)
- >> Advanced Audit Committee Program (AAP 34/2019)

Other Trainings

- >> The Joint State-Private Sector Course, Class 4414, National Defence College
- >> Capital Market Academy Leader Program, Class 7, Capital Market Academy
- >> The Program for Senior Executives on Justice Administration, Batch 8, Judicial Training Institute, National Justice Academy
- >> Advanced Administration Program, Class 34, Institute of Administration Development
- >> Advanced Certificate Course in Politics and Governance in Democratic Systems for Executives, Class 7, King Prajadhipok's Institute
- >> Public Director Certification Program, Public Director Institute (PDI), Class 3, King Prajadhipok's Institute
- >> Training Course on Good Governance for Directors and Executives of State-Owned Enterprises and Public Organization, Class 3, King Prajadhipok's Institute
- >> The Executive Program in Energy Literacy for a Sustainable Future, Class 1, Thailand Energy Academy
- >> Training Course on Administrative Justice for Executives, Class 3, Office of the Administration Courts of Thailand
- >> Top Executive Program in Commerce and Trade (TEPCoT), Class 3, Commerce Academy, University of the Thai Chamber of Commerce
- >> Detective, Class 50, Investigation School, The Royal Thai Police
- >> Police Senior Command Course, Class 14, The Royal Thai Police

- >> Advanced Political and Electoral Development Program (APED), Class 2, Office of The Election Commission of Thailand
- >> Metropolis Development Program, Class 1, Institute of Metropolitan Development
- >> The Public Legal Executive Training Program, Class 1, Office of the Council of State
- >> The Rule of Law for Democracy, Class 1, College of the Constitutional Court
- >> Executive Program Good Governance for Sustainable Development, Class 1, Office of the Public Sector Development Commission
- >> ASEAN Executive Management Programme (AseanEx), Class 2, Office of the Civil Service Commission, The Secretariat of the Prime Minister, Office of The National Economic and Social Development Board, Ministry of Foreign Affairs, Sasin Graduate Institute of Business Administration of Chulalongkorn University
- >> Business Revolution and Innovation Network (BRAIN), Class 1, The Federation of Thai Industries
- >> Thailand Insurance Leadership Program, Class 7, Office of Insurance Admission
- >> 2018 PTIT Special Lecture: "The Dawn of a New Energy Era & The Transition to High Noon"
- >> Independent Director Forum 1/2019 : "Tips and Tricks for Dealing with Questions in AGM"
- >> Thailand's 10th National Conference on Collective Action against Corruption "Innovation in the Fight against Corruption"

Working Experience in the 5 Preceding Years

- 2010 - 2015 Deputy Commissioner General, The Royal Thai Police
- 2015 - 2016 Permanent Secretary, Office of the Permanent Secretary, The Prime Minister's Office

Current Positions**1. Listed Company (2)**

- >> Independent Director and Chairman of the Corporate Governance Committee, Thai Oil Plc
- >> Director and Member of the Audit Committee, Royal Orchid Hotel (Thailand) Plc

2. Public Company (2)

- >> Independent Director and Chairman of the Board, Big C Supercenter Plc
- >> Director, Glow Energy Plc

3. Limited Company

- None -

4. Other Organizations/Institutions (3)

- >> Member of Committee of Property Management Office, Thai Red Cross Society
- >> Member of Ramkhamhaeng University Council
- >> Member of King Mongkut's Institute of Technology Ladkrabang Council

5. State Enterprise

- None -

% of Shareholding in Thaioil

- None -

Conflict of Interest

- None -

Family Relation with Other Directors

- None -

Dispute in the 10 Preceding Years

- None -

MR. YONGYUT JANTARAROTAI

Director (Non-Executive)
and Member of the Corporate Governance Committee
Age 60 Yrs.



Director Term Duration

- >> Director (Non-Executive) (Elected on April 2, 2014: 3 years)
- >> Director (Non-Executive) (Re-elected on April 7, 2017: 2 years 8 months)

Board-Committee Term Duration

- >> Member of the Corporate Governance Committee
(Appointed on April 25, 2014 and completed the term in the 2017 Annual General Meeting of Shareholders: 3 years)
- >> Member of the Corporate Governance Committee
(Appointed on May 26, 2017: 2 years 7 months)

Education

- >> Bachelor of Engineering (Civil Engineering), Kasetsart University

Director Training Courses of Thai Institute of Directors Association (IOD)

- >> Corporate Governance for Executives Program (CGE 5/2015)
- >> Financial Statements for Directors (FSD 31/2016)
- >> Director Certification Program (DCP 237/2017)
- >> Board Matters and Trends (BMT 5/2018)
- >> Ethical Leadership Program (ELP 16/2019)

Other Trainings

- >> Civil Service Executive Program: Visionary and Moral Leadership, Class 59, Office of the Civil Service Commission
- >> The Joint State-Private Sector Course, Class 22, National Defence College
- >> Training Course on Government Fiscal Management for Executives, Class 1, Comptroller General's Department
- >> Training Course on Administrative Justice for Executives, Class 6, Office of the Administrative Courts of Thailand
- >> Academic Seminar: "Money Laundering in Daily Life that We Must Have"
- >> The Executive Program in Energy Literacy for a Sustainable Future, Class 10, Thailand Energy Academy

Working Experience in the 5 Preceding Years

| | |
|-----------------------------|--|
| Nov 1, 2013 - Nov 16, 2014 | Assistant for Permanent Secretary, Ministry of Energy |
| Nov 17, 2014 - Oct 25, 2015 | Deputy Director General, Department of Alternative Energy Development and Efficiency, Ministry of Energy |
| Oct 26, 2015 - Sep 15, 2017 | Inspector General, Ministry of Energy |
| Oct 16, 2017 - Oct 11, 2018 | Deputy Permanent Secretary, Ministry of Energy |
| Oct 12, 2018 - Present | Director General, Department of Alternative Energy Development and Efficiency, Ministry of Energy |

Current Positions

1. Listed Company (1)

- >> Director and Member of the Corporate Governance Committee, Thai Oil Plc

| | |
|-------------------------------------|----------|
| 2. Public Company | - None - |
| 3. Limited Company | - None - |
| 4. Other Organizations/Institutions | - None - |
| 5. State Enterprise | - None - |

| | |
|--------------------------------------|----------|
| % of Shareholding in Thailoil | - None - |
| Conflict of Interest | - None - |
| Family Relation with Other Directors | - None - |
| Dispute in the 10 Preceding Years | - None - |

GENERAL KUKIAT SRINAKA

Independent Director (Non-Executive)
and Member of the Corporate Governance Committee
Age 59 Yrs.

**Director Term Duration**

- >> Independent Director (Non-Executive) (Appointed on November 23, 2018 and effective from January 1, 2019: 4 months)
- >> Independent Director (Non-Executive) (Re-elected on April 10, 2019 : 8 months)

Board-Committee Term Duration

- >> Member of the Audit Committee (Appointed on July 19, 2019 and vacated on September 20, 2019: 2 months)
- >> Member of the Corporate Governance Committee (Appointed on August 30, 2019 and effective from September 20, 2019: 3 months)

Education

- >> Bachelor of Science, Chulachomklao Royal Military Academy
- >> Master of Public Administration, Burapha University

Director Training Courses of Thai Institute of Directors Association (IOD)

- >> Director Certification Program (DCP 275/2019)

Other Trainings

- >> National Defence Course, Class 57, National Defence College
- >> Joint Staff College, Class 48

Working Experience in the 5 Preceding Years

| | |
|--------------------|--|
| 2013 | Commanding General of 2 nd Infantry Division, Queen's Guard |
| 2015 | Deputy Commanding General of 1 st Army Area |
| 2016 | Commanding General of 1 st Corps |
| 2017 | Commanding General of 1 st Army Area |
| 2018 - Sep 2019 | Assistant Commander-in-Chief, The Royal Thai Army |
| Oct 2019 - Present | Deputy Permanent Secretary for Defence, Ministry of Defence |

Current Positions**1. Listed Company (1)**

- >> Independent Director and Member of the Corporate Governance Committee, Thai Oil Plc

2. Public Company

- None -

3. Limited Company

- None -

4. Other Organizations/Institutions

- None -

5. State Enterprise

- None -

% of Shareholding in Thaioil

- None -

Conflict of Interest

- None -

Family Relation with Other Directors

- None -

Dispute in the 10 Preceding Years

- None -

MR. PRAPHON WONGTHARUA

Director (Non-Executive)

Age 59 Yrs.



Director Term Duration

>> Director (Non-Executive) (Appointed on February 15, 2019: 10 months)

Board-Committee Term Duration

- None -

Education

- >> Bachelor of Engineering (Mechanical Engineering),
King Mongkut's University of Technology North Bangkok
- >> Master of Engineering (Mechanical Engineering), Chulalongkorn University

Director Training Courses of Thai Institute of Directors Association (IOD)

- >> Director Certification Program (DCP 218/2016)
- >> Financial Statements for Directors (FSD 31/2016)
- >> Boards that Make a Difference (BMD 4/2017)
- >> Risk Management Program for Corporate Leaders (RCL 13/2018)
- >> IT Governance and Cyber Resilience Program (ITG 8/2018)
- >> Advanced Audit Committee Program (AACP 32/2019)
- >> Successful Formulation & Execution of Strategy (SFE 31/2019)

Other Trainings

- >> Systematic Problem Solving and Decision Making (SPSDM),
Office of the Civil Service Commission in cooperation with
ACI Consultants Co., Ltd
- >> Joint Staff College, Class 45
- >> Civil Service Executive Program: Visionary and Moral Leadership, Class 55,
Office of the Civil Service Commission
- >> National Defence Course, Class 56, National Defence College
- >> Inspector General Training Program 2015
- >> The Executive Program in Energy Literacy for a Sustainable Future, Class 8,
Thailand Energy Academy
- >> Capital Market Academy Leader Program, Class 27,
Capital Market Academy
- >> The Leadership Grid
- >> 2019 PTIT Special Lecture by Khunying Thongtip Ratanarat:
"Revisiting the Resource Revolution Arsenal & Defining Thailand's Destiny"
- >> Top Executive Program in Commerce and Trade (TEPCoT), Class 12,
Commerce Academy, University of the Thai Chamber of Commerce

Working Experience in the 5 Preceding Years

| | |
|---------------------|--|
| Oct 2008 - Feb 2014 | Director, Bureau of Biofuel Development, The Department of Alternative Energy Development and Efficiency, Ministry of Energy |
| Feb 2014 - Oct 2014 | Deputy Director General, The Energy Policy and Planning Office, Ministry of Energy |
| Oct 2014 - Aug 2015 | Inspector General, Ministry of Energy |
| Aug 2015 - Oct 2016 | Deputy Permanent Secretary, Ministry of Energy |
| Oct 2016 - Oct 2018 | Director General, The Department of Alternative Energy Development and Efficiency, Ministry of Energy |
| Oct 2018 - Present | Inspector General, Ministry of Energy |

Current Positions

1. Listed Company (1)

>> Director, Thai Oil Plc

2. Public Company

- None -

3. Limited Company

- None -

4. Other Organizations/Institutions

- None -

5. State Enterprise

- None -

% of Shareholding in Thailoil

- None -

Conflict of Interest

- None -

Family Relation with Other Directors

- None -

Dispute in the 10 Preceding Years

- None -

MS. PHANNALIN MAHAWONGTIKUL

Director (Non-Executive)
and Member of the Risk Management Committee
Age 55 Yrs.

**Director Term Duration**

>> Director (Non-Executive) (Appointed on September 28, 2018
and effective from October 1, 2018: 1 year 3 months)

Board-Committee Term Duration

>> Member of the Risk Management Committee
(Appointed on September 28, 2018 and effective from October 1, 2018:
1 year 3 months)

Education

>> Bachelor of Science in Accounting (B.B.A.), Thammasat University
>> Master of Business Administration, Thammasat University

Director Training Courses of Thai Institute of Directors Association (IOD)

>> Director Certification Program (DCP 279/2019)

Other Trainings

>> Capital Market Academy Leader Program, Class 24,
Capital Market Academy
>> Leadership Succession Program (LSP), Class 6,
Institute of Research and Development for Public Enterprises
>> CMA-Greater Mekong Subregion (CMA-GMS), Class 1,
Capital Market Academy
>> PTT-HBS Leadership Development Program (HBS) II,
Harvard Business School, USA
>> NIDA-Wharton Executive Leadership Program (ELP),
The Wharton School, University of Pennsylvania, USA
>> Executive Program for Senior Management (EX-PSM), Class 3,
Fiscal Policy Research Institute Foundation
>> Executive Development Program (EDP), Class 2,
Thai Listed Companies Association
>> Leadership Development Program (LDP) III,
PTT Leadership and Learning Institute (PLLI)
>> IOD National Director Conference 2019: "Board of the Future"

Working Experience in the 5 Preceding Years

| | |
|---------------------|--|
| 2012 - 2014 | Vice President, Finance Strategy and Policy, PTT Plc |
| 2014 - 2015 | Executive Vice President, Corporate Finance, PTT Plc |
| Jan 2016 - Sep 2018 | Executive Vice President, PTT Plc secondment to PTT Exploration and Production Plc as Senior Executive Vice President, Finance and Accounting Group |
| Oct 2018 - Apr 2019 | Chief Financial Officer (Act.), PTT Plc |
| Apr 2019 - Present | Chief Financial Officer, PTT Plc |

Current Positions**1. Listed Company (2)**

>> Director and Member of the Risk Management Committee, Thai Oil Plc
>> Chief Financial Officer, PTT Plc

2. Public Company

- None -

3. Limited Company

- None -

4. Other Organizations/Institutions

- None -

5. State Enterprise

- None -

% of Shareholding in Thailoil

- None -

Conflict of Interest

- None -

Family Relation with Other Directors

- None -

Dispute in the 10 Preceding Years

- None -

MR. PREECHA POCATANAWAT

Director (Non-Executive)

Age 59 Yrs.



Director Term Duration

>> Director (Non-Executive) (Appointed on April 10, 2019: 8 months)

Board-Committee Term Duration

- None -

Education

- >> Bachelor of Laws and Bachelor of Business Administration, Ramkhamhaeng University
- >> Barrister-at-Law, The Institute of Legal Education, Thai Bar Association

Director Training Courses of Thai Institute of Directors Association (IOD)

>> Director Certification Program (DCP 261/2018)

Other Trainings

- >> Leadership Development Program (LDP) II 2014, China
- >> Strategy and Innovation for Business in Asia Program (SIBA), Class 4/2015, College of Management, Mahidol University
- >> Senior Executive Certificate in Anti-Corruption Strategic Management, Class 8/2017, Sanya Dharmasakti National Anti-Corruption Institute (SDI)
- >> Leadership Development Program (LDP) III 2018, Singapore
- >> IRDP Leadership & Effective Corporate Culture Program 2018, Institute of Research & Development for Public Enterprises (IRDP)
- >> Management Development Program (MDP) 3 Level 13 - 14 Business Management
- >> IOD National Director Conference 2019: "Board of the Future"

Working Experience in the 5 Preceding Years

| | |
|---------------------|---|
| 2012 - 2015 | Vice President, Finance, Account and Corporate Support, HMC Polymers Co., Ltd. |
| 2015 - Sep 2018 | Executive Vice President, Corporate Human Resources, PTT Plc |
| Oct 2018 - Apr 2019 | Senior Executive Vice President (Act.), Organization Management and Sustainability, PTT Plc |
| Apr 2019 - Present | Senior Executive Vice President, Organization Management and Sustainability, PTT Plc |

Current Positions

1. Listed Company (2)

- >> Director, Thai Oil Plc
- >> Senior Executive Vice President, Organization Management and Sustainability, PTT Plc

2. Public Company

- None -

3. Limited Company (2)

- >> Director and Chairman of the Board, Business Services Alliance Co., Ltd.
- >> Director and Chairman of the Board, Business Professional Solutions Co., Ltd.

4. Other Organizations/Institutions

- None -

5. State Enterprise

- None -

% of Shareholding in Thailoil

- None -

Conflict of Interest

- None -

Family Relation with Other Directors

- None -

Dispute in the 10 Preceding Years

- None -

MS. DUANGPORN THIENGWATANATHAM

Director (Non-Executive)

Age 58 Yrs.

**Director Term Duration**

- >> Director (Non-Executive) (Appointed on September 28, 2018 and effective from October 1, 2018: 7 months)
- >> Director (Non-Executive) (Re-elected on April 10, 2019: 8 months)

Board-Committee Term Duration

- None -

Education

- >> Bachelor of Engineering (Chemical Engineering), Chulalongkorn University
- >> Master of Chemical Engineering, The University of British Columbia, Canada
- >> Master of Business Management, Sasin Graduate Institute of Business Administration of Chulalongkorn University

Director Training Courses of Thai Institute of Directors Association (IOD)

- >> Director Certification Program (DCP 135/2010)
- >> Financial Statements for Directors (FSD 8/2010)
- >> Board Matters and Trends (BMT 8/2019)
- >> Director Development Program (DDP 1/2019) (PTT In-house Course)

Other Trainings

- >> PTT Executive Leadership Program, General Electric, New York, USA
- >> Enterprise Risk Management Framework, PricewaterhouseCoopers
- >> Strategic Marketing Management, Stanford Graduate School of Business, USA
- >> 2018 PTIT Special Lecture: "Clean Energy and Smart Transportation: Global Trend for Sustainable World"
- >> 2019 PTIT Special Lecture: "Revisiting the Resource Revolution Arsenal & Defining Thailand's Destiny"

Working Experience in the 5 Preceding Years

| | |
|---------------------|--|
| 2013 - 2015 | Executive Vice President, Subsidiary Planning & Management Petrochemical & Refining Business Unit, PTT Plc |
| Jan - Sep 2016 | Executive Vice President, Downstream Business Group Planning, PTT Plc |
| Oct 2016 - Mar 2017 | Executive Vice President, Downstream Business Group Collaboration, PTT Plc |
| Apr - Dec 2017 | Executive Vice President, PTT Research and Technology Institute, PTT Plc |
| Jan - Sep 2018 | Executive Vice President, Innovation Institute, PTT Plc |
| Oct 2018 - Apr 2019 | Senior Executive Vice President (Act.), Downstream Business Group Alignment, PTT Plc |
| Apr - Oct 2019 | Senior Executive Vice President, Downstream Business Group Alignment, PTT Plc |
| Nov 2019 - Present | Senior Executive Vice President, Corporate Governance and Regulatory Affairs, PTT Plc |

Current Positions**1. Listed Company (2)**

- >> Director, Thai Oil Plc
- >> Senior Executive Vice President, Corporate Governance and Regulatory Affairs, PTT Plc

2. Public Company

- None -

3. Limited Company (1)

- >> Director and Chairman of the Board, Sarn Palung Social Enterprise Co., Ltd.

4. Other Organizations/Institutions

- None -

5. State Enterprise

- None -

% of Shareholding in Thailoil 600 shares
equivalent to 0.00003%

Conflict of Interest - None -

Family Relation with Other Directors - None -

Dispute in the 10 Preceding Years - None -

MR. WIRAT UANARUMIT

Director (Executive), Member of the Risk Management Committee
Chief Executive Officer and President and the Secretary to the Board of Directors
Age 57 Yrs



Director Term Duration

>> Director (Executive) (Appointed on June 21, 2019
and effective from September 1, 2019: 4 months)

Board-Committee Term Duration

>> Member of the Risk Management Committee
(Appointed on June 21, 2019 and effective from September 1, 2019: 4 months).

Education

>> Bachelor of Engineering (Electrical Engineering), Chulalongkorn University
>> Master of Business Administration (Financial Management),
Pennsylvania State University, USA

Director Training Courses of Thai Institute of Directors Association (IOD)

>> Director Certification Program (DCP 8/2001)
>> Audit Committee Program (ACP 38/2012)
>> Director Certification Program Update (DCPU 5/2015)
>> Ethical Leadership Program (ELP 7/2017)

Other Trainings

>> The Joint State-Private Sector Course, Class 2556, National Defence College
>> Advanced Security Management Program, Class 2,
The National Defence College Association of Thailand (NDCAT)
>> Advanced Certificate Course in Politics and Governance in Democratic
Systems for Executives, Class 20, King Prajadhipok's Institute
>> The Programme for Senior Executives on Justice Administration, Batch 16,
Judicial Training Institute, National Justice Academy
>> Capital Market Academy Leader Program, Class 4, Capital Market Academy
>> The Executive Program in Energy Literacy for a Sustainable Future, Class 13,
Thailand Energy Academy
>> Executive Management with Business Development and Investment, Class 2,
Institute of Business and Industrial Development (IBID)
>> Rule of Law for Democracy, Class 6, College of the Constitutional Court
>> Executive Development Program (EDP), Class 1,
Thai Listed Companies Association
>> Advanced Management Program, INSEAD Business School,
INSEAD Executive Education, France
>> Advanced Management Program, Class 184, Harvard Business School,
Harvard University, USA
>> GE Global Customer Summit Crotonville

Working Experience in the 5 Preceding Years

2005 - Apr 2014 Executive Vice President - Corporate Finance, PTT Plc
May 2014 - Sep 2016 Chief Financial Officer, PTT Plc
Oct 2016 - Aug 2019 Chief Operating Officer,
Upstream Petroleum and Gas Business Group, PTT Plc
Sep 2019 - Present Chief Operating Officer, PTT Plc secondment to
Thai Oil Plc as Chief Executive Officer and President

Current Positions

1. Listed Company (3)

>> Director, Member of the Risk Management Committee,
Chief Executive Officer and President,
and the Secretary to the Board of Directors, Thai Oil Plc
>> Director and Member of the Risk Management Committee,
Global Power Synergy Plc
>> Chief Operating Officer, PTT Plc

2. Public Company (1)

>> Director and Chairman of the Board, Thai Lube Base Plc

3. Limited Company (6)

>> Director and Chairman of the Board, Thai Paraxylene Co., Ltd.
>> Director and Chairman of the Board, Labix Co., Ltd.
>> Director and Chairman of the Board, Thailoil Power Co., Ltd.
>> Director and Chairman of the Board, TOP SPP Co., Ltd.
>> Director and Chairman of the Board, Thailoil Marine Co., Ltd.
>> Director and Chairman of the Board, Thailoil Solvent Co., Ltd.

4. Other Organizations/Institutions

- None -

5. State Enterprise

- None -

% of Shareholding in Thailoil

- None -

Conflict of Interest

- None -

Family Relation with Other Directors

- None -

Dispute in the 10 Preceding Years

- None -

MR. SUCHALEE SUMAMAL

Director (Non-Executive)

(Resigned from Directorship: January 1, 2019)

Age 61 Yrs.

**Director Term Duration**

- >> Director (Non-Executive) (Appointed on November 24, 2017 and effective from December 1, 2017: 5 months)
- >> Director (Non-Executive) (Re-elected on April 11, 2018: 8 months)

Board-Committee Term Duration

- None -

Education

- >> Bachelor of Economics, Ramkhamhaeng University
- >> Master of Public Administration, Sripatum University

Director Training Courses of Thai Institute of Directors Association (IOD)

- >> Director Accreditation Program (DAP 142/2017)
- >> Director Certification Program (DCP 255/2018)

Other Trainings

- >> The Executive Program in Energy Literacy for a Sustainable Future, Class 9, Thailand Energy Academy
- >> Ministry Inspector General Skills, Class 2016, Office of the Civil Service Commission
- >> Public Legal Executive Training Programme, Class 4, Public Lawyer Development Institute, Officer of the Council of State
- >> Training Course on Administrative Justice for Executives, Class 6, Office of the Administrative Courts of Thailand

Working Experience in the 5 Preceding Years

- 2013 - 2015 Deputy Director-General, Energy Policy and Planning Office, Ministry of Energy
- 2015 - 2017 Inspector General, Ministry of Energy
- 2017 - Sep 2018 Chief of Inspector General, Ministry of Energy

Current Positions

- | | |
|--------------------------------------|----------|
| 1. Listed Company | - None - |
| 2. Public Company | - None - |
| 3. Limited Company | - None - |
| 4. Other Organizations/Institutions | - None - |
| 5. State Enterprise | - None - |
| % of Shareholding in Thaioil | - None - |
| Conflict of Interest | - None - |
| Family Relation with Other Directors | - None - |
| Dispute in the 10 Preceding Years | - None - |

MR. NOPPADOL PINSUPA

Director (Non-Executive)
and Member of the Risk Management Committee
(Resigned from Directorship: January 31, 2019)
Age 55 Yrs.



Director Term Duration

- >> Director (Non-Executive) (Elected on September 25, 2015 and effective from October 1, 2015: 7 months)
- >> Director (Non-Executive) (Re-elected on April 7, 2016: 2 years 9 months)

Board-Committee Term Duration

- >> Member of the Risk Management Committee
(Appointed on September 25, 2015, effective from October 1, 2015 and completed the term in the 2016 Annual General Meeting of Shareholders: 7 months)
- >> Member of the Risk Management Committee
(Appointed on April 27, 2016: 2 years 9 months)
- >> Chairman of the Risk Management Committee
(Elected on December 12, 2017, effective from January 1, 2018, and resigned from the position of "Chairman of the Risk Management Committee" on October 11, 2018: 10 months)

Education

- >> Bachelor of Engineering (Electrical Engineering), Chulalongkorn University
- >> Master of Engineering (Electrical Engineering), Chulalongkorn University

Director Training Courses of Thai Institute of Directors Association (IOD)

- >> Director Certification Program (DCP 146/2011)
- >> Financial Statements for Directors (FSD 12/2011)

Other Trainings

- >> National Defence Course, Class 60, National Defence College
- >> Capital Market Academy Leader Program, Class 22, Capital Market Academy
- >> G-20 Y Summit 2015, France
- >> Mitsui-HBS Global Management Academy 2015, Japan and USA
- >> The Programme for Senior Executives on Justice Administration, Batch 19, Judicial Training Institute, National Justice Academy
- >> Leadership Development Program (LDP) III, PTT Leadership and Learning Institute (PLLI)
- >> Breakthrough Program for Senior Executives (BPSE), International Leading Business School (IMD), Lausanne, Switzerland
- >> Assessor Training Program, Office of Thailand Quality Award
- >> Financial Statements for Directors by PTT Plc
- >> The Executive Program in Energy Literacy for a Sustainable Future, Class 14, Thailand Energy Academy
- >> TIJ Executive Program on Rule of Law and Development (RoLD), Class 2017, Thailand Institute of Justice (Public Organization)

Working Experience in the 5 Preceding Years

- | | |
|---------------------|---|
| 2012 - 2014 | Executive Vice President - Natural Gas Vehicle, PTT Plc |
| Oct 2014 - Sep 2015 | Executive Vice President, PTT Plc secondment to Global Power Synergy Plc as President |
| Sep 2015 - Jan 2019 | Senior Executive Vice President - Gas Business Unit, PTT Plc |
| Feb 2019 - Present | Senior Executive Vice President, Downstream Petroleum Business Group, secondment to IRPC Plc as President |

Current Positions

1. Listed Company (2)

- >> Director, Member of the Risk Management Committee, President and Secretary of the Board of Directors, IRPC Plc
- >> Senior Executive Vice President, Downstream Petroleum Business Group, PTT Plc

2. Public Company (1)

- >> Director, UBE Chemical (Asia) Plc

3. Limited Company (6)

- >> Director and Vice Chairman of the Board, PTT Energy Solutions Co., Ltd.
- >> Director and Chairman of the Board, IRPC Oil Co., Ltd.
- >> Director and Chairman of the Board, IRPC Polyol Co., Ltd.
- >> Director and Chairman of the Board, IRPC A&L Co., Ltd.
- >> Director and Chairman of the Board, IRPC Technology Co., Ltd.
- >> Director and Chairman of the Board, I Polymer Co., Ltd.

4. Other Organizations/Institutions

- None -

5. State Enterprise

- None -

% of Shareholding in Thailoil

- None -

Conflict of Interest

- None -

Family Relation with Other Directors

- None -

Dispute in the 10 Preceding Years

- None -

MR. CHEN NAMCHASIRI

Independent Director (Non-Executive)
and Member of the Audit Committee
(Resigned from Directorship: May 10, 2019)
Age 63 Yrs.

**Director Term Duration**

>> Independent Director (Non-Executive) (Elected on April 7, 2017:
2 years 1 month)

Board-Committee Term Duration

>> Member of the Audit Committee (Appointed on April 27, 2018: 1 year 1 month)

Education

>> Bachelor of Engineering (Mechanical Engineering), Chulalongkorn University
>> Master of Mechanical and Industrial Engineering, Stanford University,
California, USA

Director Training Courses of Thai Institute of Directors Association (IOD)

>> Director Accreditation Program (DAP 11/2004)
>> Director Certification Program (DCP 138/2010)
>> Diploma Examination Program (EXAM 30/2011)
>> Advanced Audit Committee Program (AACP 32/2019)
>> Risk Management Program for Corporate Leaders (RCL16/2019)

Other Trainings

>> The Joint State-Private Course, Class 17, National Defence College
>> The Executive Program in Energy Literacy for a Sustainable Future, Class 2,
Thailand Energy Academy
>> Capital Market Academy Leader Program, Class 23, Capital Market Academy
>> Modern Managers Program (MMP), Class 3, Chulalongkorn Business School
>> Internal Accounting Control Seminar, SGV-Arthur Anderson
>> Cooperate Finance, Institute for International Research, SGV-Arthur Anderson
>> Activity Based Costing, Institute for International Research,
SGV-Arthur Anderson
>> CSR for Corporate Sustainability,
The Stock Exchange of Thailand-Sustainable Development
>> 2018 PTIT Special Lecture: "The Dawn of a New Energy Era &
The Transition to High Noon"
>> 2018 PTIT Special Lecture: "Clean Energy and Smart Transportation:
Global Trend for Sustainable World"

Working Experience in the 5 Preceding Years

1989 - Present Director and Manager, Siri Holding Co., Ltd.
1996 - Present Director and Managing Director, Chen Ann Jule Co., Ltd.
1997 - Present Executive Director and President, Asia Fiber Plc

Current Positions

1. Listed Company (1)
 - >> Executive Director and President, Asia Fiber Plc
 2. Public Company - None -
 3. Limited Company (2)
 - >> Director and Manager, Siri Holding Co., Ltd.
 - >> Director and Managing Director, Chen Ann Jule Co., Ltd.
 4. Other Organizations/Institutions (5)
 - >> Director, National Research Council of Thailand
 - >> Director, Energy Fund Administration Institute (Public Organization),
Ministry of Energy
 - >> Director, Thailand Greenhouse Gas Management Organization
(Public Organization)
 - >> Director, National Science and Technology Development Agency (NSTDA)
 - >> Senator
 5. State Enterprise - None -
- % of Shareholding in Thaioil - None -
Conflict of Interest - None -
Family Relation with Other Directors - None -
Dispute in the 10 Preceding Years - None -

MR. ATIKOM TERBSIRI

Director (Executive), Member of the Risk Management Committee
Chief Executive Officer and President and the Secretary to the Board of Directors
(Resigned from Directorship: September 1, 2019)
Age 57 Yrs.



Director Term Duration

- >> Director (Non-Executive) (Appointed on September 12, 2014: 1 month)
- >> Director (Executive) (Appointed on September 26, 2014 and effective from October 1, 2014: 6 months)
- >> Director (Executive) (Re-elected on April 3, 2015: 3 years)
- >> Director (Executive) (Re-elected on April 11, 2018: 1 year 5 months)

Board-Committee Term Duration

- >> Member of the Risk Management Committee
(Appointed on September 26, 2014 and effective from October 1, 2014: 4 years 11 months)

Education

- >> Bachelor of Business Administration, Assumption University
- >> Master of Business Administration (Finance & International Business)
(High Distinction), Armstrong University, USA

Director Training Courses of Thai Institute of Directors Association (IOD)

- >> Director Certification Program (DCP 125/2009)
- >> Risk Management Program for Corporate Leaders (RCL 4/2016)
- >> Role of the Chairman Program (RCP 41/2017)

Other Trainings

- >> The Executive Program in Energy Literacy for a Sustainable Future, Class 6, Thailand Energy Academy
- >> The State, Private Sector and Political Sectors Course, Class 5, National Defence College
- >> Advanced Security Management Program, Class 1, National Defence College
- >> Capital Market Academy Leader Program, Class 17, Capital Market Academy
- >> Executive Education Program, Harvard Business School, Harvard University, USA
- >> Seminar: "Anti-corruption: Leadership Role of the Board"
- >> 2018 PTIT Special Lecture: "Clean Energy and Smart Transportation: Global Trend for Sustainable World"
- >> PTIT Public Lecture on "Global Oil & Gas Markets in Turmoil-Implications for Thailand"

Working Experience in the 5 Preceding Years

- | | |
|---------------------|--|
| 2013 - Sep 2014 | Senior Executive Vice President-Petrochemicals & Refining Business Unit, PTT Plc |
| Oct 2014 - Aug 2019 | Senior Executive Vice President, PTT Plc secondment to Thai Oil Plc as Chief Executive Officer and President |
| Sep 2019 - Present | Chief Operating Officer, Upstream Petroleum and Gas Business Group, PTT Plc |

Current Positions

1. Listed Company (2)

- >> Chief Operating Officer, Upstream Petroleum and Gas Business Group, PTT Plc
- >> Director and Member of the Risk Management Committee, PTT Exploration and Production Plc

2. Public Company

- None -

3. Limited Company (2)

- >> Director and Chairman of the Board, PTT LNG Co., Ltd.
- >> Director and Chairman of the Board, Sakari Resources Limited

4. Other Organizations/Institutions

- None -

5. State Enterprise

- None -

% of Shareholding in Thaioil

- None -

Conflict of Interest

- None -

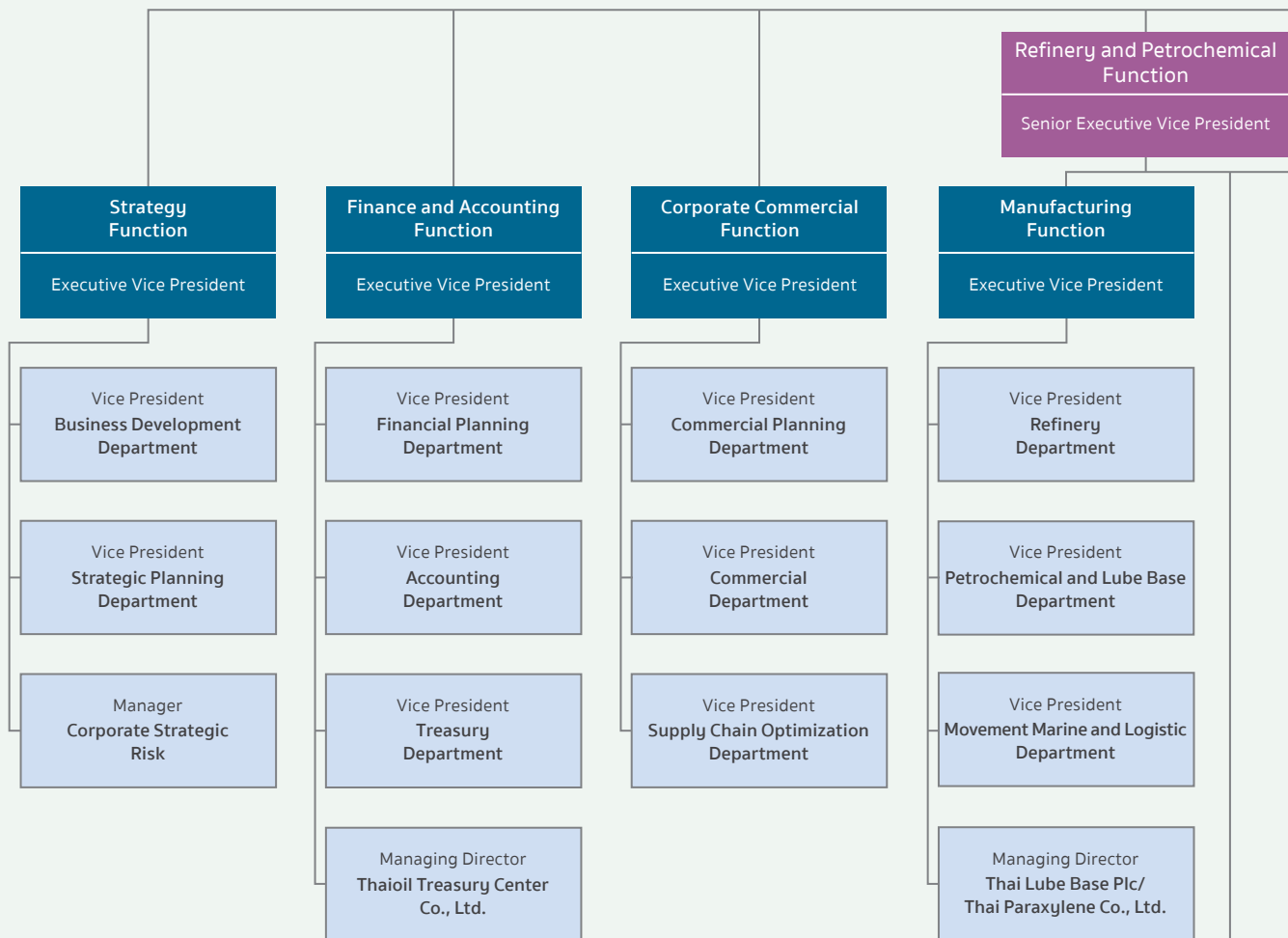
Family Relation with Other Directors

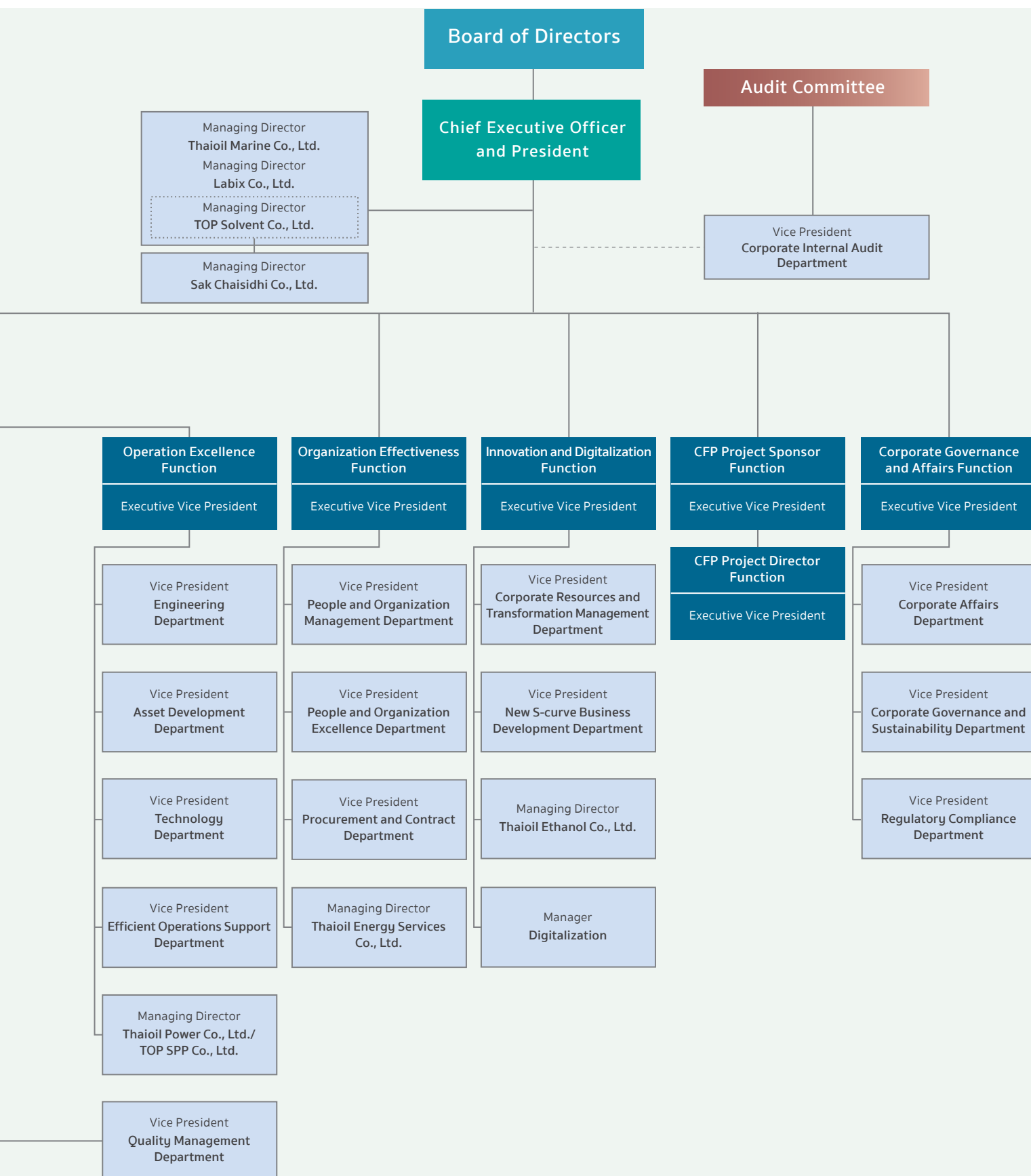
- None -

Dispute in the 10 Preceding Years

- None -

ORGANIZATIONAL STRUCTURE







EXECUTIVES

As of December 31, 2019

**01 Mr. Wirat Uanarumit**

Chief Executive Officer and President

02 Mr. Bandhit ThamprajamchitSenior Executive Vice President
Refinery and Petrochemical and
Executive Vice President Operation Excellence (Act.)**03 Mr. Jeerawat Pattanasomsit**Executive Vice President Manufacturing
and Vice President Refinery (Act.)**04 Mr. Chatapong Wungtanagorn**Executive Vice President Corporate Commercial
and Vice President Commercial Planning (Act.)**05 Mr. Charlee Balmongkol**

Executive Vice President CFP Project Director

06 Mr. Pongpun AmornvivatExecutive Vice President Strategy
and Executive Vice President
Innovation and Digitalization (Act.)**07 Ms. Pattaralada Sa-Ngasang**

Executive Vice President Finance and Accounting

08 Mr. Viroj MeenaphantExecutive Vice President Corporate Governance and Affairs,
Vice President Corporate Affairs (Act.)
and Company Secretary**09 Mr. Viroj Wongsathirayakhun**Executive Vice President Organization Effectiveness,
Vice President People and Organization Management (Act.)
and Vice President assigned as Managing Director,
Thail Energy Services Co., Ltd.



10



11



12



13



14



15



16



17



18

10 Mr. Surachai Saengsamran

Executive Vice President CFP Project Sponsor

11 Mr. Jumpon Thapanapong

Vice President Corporate Resources
and Transformation Management

12 Mr. Chet Prongchit

Vice President Movement Marine and Logistic

13 Mr. Narongsak Chaviengpob

Vice President Engineering

14 Mr. Nattapong Tumsaroj

Vice President Business Development

15 Mr. Nuttapon Meerit

Vice President Special Assignment
assigned as CFP Process Manager

16 Ms. Duangporn Teerapabpaisit

Senior Vice President-assigned as
Managing Director, Labix Co., Ltd.

17 Ms. Torsang Chaipravat

Vice President Strategic Planning
and Vice President assigned as
Managing Director, Thailoil Ethanol Co., Ltd.

18 Ms. Tarika Devahastin

Vice President Financial Planning

**19 Mr. Nikom Kongnok**

Vice President Accounting

20 Mr. Nitas KrongvanitchayakulSenior Vice President-assigned as
Managing Director, Thail Marine Co., Ltd.**21 Ms. Prapin Thongnium**

Vice President Corporate Internal Audit

22 Mr. Phumchit TatsanaprasertVice President Quality Management
and Vice President Efficient Operations Support (Act.)**23 Mr. Mongkol Janchookiat**

Vice President Procurement and Contract

24 Ms. Rungtip Maneesarachun

Vice President Treasury

25 Ms. Runnapa Janchookiat

Vice President Technology

26 Mr. Sarunyu LimwongseVice President Petrochemical and Lube Base,
and Vice President assigned as Managing Director,
Thai Lube Base Plc and Thai Paraxylene Co., Ltd.**27 Ms. Somporn Bunluesriruang**

Vice President Supply Chain Optimization



28 Mr. Santi Wasanasiri
Vice President New S-curve Business Development



29 Ms. Suchada Deechaiya
Vice President People and Organization Excellence



30 Ms. Sudarat Orrattanasakul
Vice President Regulatory Compliance



31 Ms. Suwimol Chaluaydumrong
Vice President Corporate Governance and Sustainability



33 Ms. Acharee Tigabhorn
Vice President assigned as
Managing Director, Thail Solvent Co., Ltd.
and TOP Solvent Co., Ltd.



34 Mr. Udom Wongsirinopphakhun
Vice President Asset Development,
and Vice President assigned as Managing Director,
Thail Power Co., Ltd. and TOP SPP Co., Ltd.

32 Mr. Anawat Chansaksoong
Vice President Commercial

ASSETS AND SHAREHOLDERS INFORMATION AND MANAGEMENT STRUCTURE

Assets and Shareholders Information

Registered and Paid-up Capitals

Ordinary Shares

On the share registration book closing date as of September 13, 2019, Thailoil's registered capital was THB 20,400,278,730 and the paid up capital was THB 20,400,278,730, comprised of 2,040,027,873 ordinary shares at the par value of THB 10 per share

Shareholders

As of September 13, 2019, the major shareholders (holding 0.50% and more of paid up capital) are as follows:

| Major Shareholders | Number of Shares | Shareholding Percentage |
|---|----------------------|-------------------------|
| 1. PTT PUBLIC COMPANY LIMITED ⁽¹⁾ | 969,565,183 | 47.527 % |
| 2. THAI NVDR COMPANY LIMITED ⁽²⁾ | 186,051,902 | 9.120 % |
| 3. SOUTH EAST ASIA UK (TYPE C) NOMINEES LIMITED | 80,998,540 | 3.970 % |
| 4. STATE STREET EUROPE LIMITED | 78,459,654 | 3.846 % |
| 5. SOCIAL SECURITY OFFICE | 33,528,000 | 1.644 % |
| 6. THE BANK OF NEW YORK (NOMINEES) LIMITED | 20,037,542 | 0.982 % |
| 7. THE BANK OF NEW YORK MELLON | 19,112,200 | 0.937 % |
| 8. SOUTH EAST ASIA UK (TYPE A) NOMINEES LIMITED | 18,456,477 | 0.905 % |
| 9. GIC PRIVATE LIMITED | 13,247,800 | 0.649 % |
| 10. KRUNGSRI DIVIDEND STOCK LTF | 10,933,600 | 0.536 % |
| TOTAL | 1,430,390,898 | 70.116 % |

Remark:

⁽¹⁾ As a major shareholder of Thailoil, PTT Public Company Limited, whose major shareholder is Ministry of Finance, participates in formulating the Company's management and operational policies via directors nominated to Thailoil's Board of Directors and casting their votes in Board meetings. As of December 31, 2019, there are five directors from a total of 15 who are also holding position as PTT Board of Directors and/or Management team.

⁽²⁾ Thai NVDR Co., Ltd., a subsidiary of the Stock Exchange of Thailand with the objective of promoting investor's investment, particularly foreign investors, in order to invest in common stock of listed companies without being restricted by the foreign shareholding limit which does not have the rights to vote at meetings of listed companies.

Issuance of Other Securities

Debentures

On October 17, 2019, Thailoil Treasury Center Co., Ltd. (TTC), a subsidiary wholly owned by Thailoil, issued and offered Senior Unsecured Debentures of USD 565 million with the tenor of 30 years due in 2049. The Debentures are guaranteed by Thailoil.

As of December 31, 2019, Thailoil and Subsidiaries issued seven Senior Unsecured Debentures worth a total of USD 2.565 billion. Two of which were issued by Thailoil worth a total of USD 389 million: USD 216 million due in 2023 and USD 173 million due in 2043. The other five Senior Unsecured Debentures were issued by TTC worth a total of USD 2.176 billion: USD 284 million due in 2023, USD 400 million due in 2028, USD 327 million due in 2043, USD 600 million due in 2048, and USD 565 million due in 2049. All debentures are fully guaranteed by Thailoil.

Apart from these, Thailoil had issued four Senior Unsecured and Unsubordinated Debentures worth a total of THB 20.5 billion: THB 3.0 billion due in 2021, THB 3.0 billion due in 2022, THB 7.0 billion due in 2024, and THB 7.5 billion due in 2027.

The fund gained from the issuance and offer of the aforementioned debentures will serve as long-term capital for investment, business expansion, debt repayment, and/or working capital, and other purposes of Thailoil and Subsidiaries.

Dividend Policy

The Company's dividend payout policy is to pay at least 25% of the consolidated net profit after deductions of all categories of reserves as specified in applicable laws

and the Company's Articles of Association. Each year, the dividend payments are subjected to Thailoil and Subsidiaries' cash flows and investment plans and other necessities and factors the Board of Directors (the Board) deems appropriate. The Board may consider paying the annual dividend with approval from the Annual General Meeting of Shareholders (AGM), except the payment of interim dividend, which the Board has the authority to approve periodically when the Company's profit deems appropriate. The interim dividend payment shall be reported at the following AGM.

The Dividend Policy for Subsidiaries of Thailoil shall be considered by the Board of each subsidiary, and later proposed to each subsidiary's AGM for approval each year. Consideration shall be made on investment plans and other requirements, such as adequacy of cash flow of each company after deducting reserve funds in compliance with the law.

Dividend Payout Information

| Year | 2013 ⁽¹⁾ | 2014 ⁽¹⁾ | 2015 | 2016 | 2017 | 2018 |
|-----------------------------|---------------------|---------------------|------|-------|-------|------|
| Earnings (THB per share) | 4.57 | (2.03) | 5.97 | 10.40 | 12.18 | 4.97 |
| Dividend (THB per share) | 2.30 | 1.16 | 2.70 | 4.50 | 5.25 | 2.65 |
| Dividend Payout (%) | 50.0 | N/A | 45.0 | 43.0 | 43.0 | 53.0 |

Remark:

⁽¹⁾ Revised in accordance with Thai Financial Reporting Standards 10 (TFRS 10) on Consolidated Financial Statements, which is effective for Annual Accounting periods beginning on or after January 1, 2015, having a restatement on Statement of Financial Position as of December 31, 2013 and 2014 as well as Statement of Income and Statement of Cash Flows as of December 31, 2014.

Management Structure

The management structure of Thai Oil Public Company Limited comprises of:

- >> The Board of Directors (the Board)
- >> The four Board-Committees supporting the consideration of important issues as assigned by the Board: the Audit Committee, the Nomination and Remuneration Committee, the Corporate Governance Committee, and the Risk Management Committee

- >> The executives with the Chief Executive Officer and President as the highest executive of the Company

The Board of Directors (as of December 31, 2019)

The Board comprised of 15 directors as follows:

- >> 14 Non-Executive Directors, six of which are Independent Directors
- >> One Executive Director, namely the Chief Executive Officer and President

The Board as of December 31, 2019 comprised of:

| Name-Surname | Position | Effective Date |
|--|--|---|
| 1. Prof. Dr. Thosaporn Sirisumphand ⁽¹⁾ | Independent Director | May 25, 2012 April 3, 2015 (re-elected) April 11, 2018 (re-elected) |
| | Director and Chairman of the Board | August 23, 2018 |
| 2. Mr. Kanit Si | Independent Director and Chairman of the Audit Committee | February 1, 2018 April 10, 2019 (re-elected) |
| 3. Ms. Chularat Suteethorn ⁽²⁾ | Independent Director | September 20, 2013 April 3, 2015 (re-elected) April 11, 2018 (re-elected) |
| | Director and Member of the Risk Management Committee | September 20, 2019 |
| 4. Assoc. Prof. Dr. Pasu Decharin | Independent Director, Member of the Audit Committee and Member of the Nomination and Remuneration Committee | April 11, 2018 |
| 5. Mr. Praphaisith Tankeyura | Independent Director and Member of the Audit Committee | September 1, 2019 |
| 6. ACM Suttipong Inseepong | Independent Director and Chairman of the Nomination and Remuneration Committee | February 1, 2016 April 7, 2017 (re-elected) |
| 7. Mr. Auttapol Rerkpiboon | Director Chairman of the Risk Management Committee and Member of the Nomination and Remuneration Committee | April 11, 2018 April 10, 2019 (re-elected) |
| 8. Pol. Gen. Aek Angsanant | Independent Director and Chairman of the Corporate Governance Committee | April 7, 2017 |

| Name-Surname | Position | Effective Date |
|------------------------------------|--|--|
| 9. Mr. Yongyut Jantararotai | Director and Member of the Corporate Governance Committee | April 2, 2014 April 7, 2017 (re-elected) |
| 10. Gen. Kukiat Srinaka | Independent Director and Member of the Corporate Governance Committee | January 1, 2019 April 10, 2019 (re-elected) |
| 11. Mr. Praphon Wongtharua | Director | February 15, 2019 |
| 12. Ms. Phannalin Mahawongtikul | Director and Member of the Risk Management Committee | October 1, 2018 |
| 13. Mr. Preecha Pocatanaawat | Director | April 10, 2019 |
| 14. Ms. Duangporn Thiengwatanatham | Director | October 1, 2018 April 10, 2019 (re-elected) |
| 15. Mr. Wirat Uanarumit | Director Member of the Risk Management Committee, Chief Executive Officer and President, and Secretary to the Board | September 1, 2019 |

Remarks:

⁽¹⁾ Qualifications of Independent Director ended on August 22, 2018.

⁽²⁾ Qualifications of Independent Director ended on September 20, 2019.

The Board's profile, qualifications, and shareholding information are elaborated in "Board of Directors" section on page 76.

The Directors who Resigned and Completed the Term during the Year 2019 are as follows:

| Name-Surname | Position | Reasons |
|-------------------------|---|--|
| 1. Mr. Suchalee Sumamal | Director | Resigned, effective from January 1, 2019 |
| 2. Mr. Noppadol Pinsupa | Director and Member of the Risk Management Committee | Resigned, effective from January 31, 2019 |
| 3. Mr. Chen Namchaisiri | Independent Director and Member of the Audit Committee | Resigned, effective from May 10, 2019 |
| 4. Mr. Atikom Terbsiri | Director Member of the Risk Management Committee, Chief Executive Officer and President, and Secretary to the Board | Resigned, effective from September 1, 2019 |

Shareholding Report of the Board of Directors and the Company's Executives in 2019
(Inclusive of Spouse, Unmarried Partner, and Minor)
Information as of December 31, 2019

| Name-Surname | No. of Shares/Changes | | No. of Shares Addition (Reduction) During the Year |
|-------------------------------------|-----------------------|--------------------|--|
| | as of Dec 31, 2018 | as of Dec 31, 2019 | |
| 1. Prof. Dr. Thosaporn Sirisumphand | - | - | - |
| By Spouse and/or Minor | - | - | - |
| 2. Mr. Kanit Si | - | - | - |
| By Spouse and/or Minor | 20,000 | 20,000 | - |
| 3. Ms. Chularat Suteethorn | 10,000 | 10,000 | - |
| By Spouse and/or Minor | - | - | - |
| 4. Assoc. Prof. Dr. Pasu Decharin | - | - | - |
| By Spouse and/or Minor | - | - | - |
| 5. Mr. Praphaisith Tankeyura | N/A | - | N/A |
| By Spouse and/or Minor | N/A | - | N/A |
| 6. ACM Suttipong Inseepong | - | - | - |
| By Spouse and/or Minor | - | - | - |
| 7. Mr. Auttapol Rerkpiboon | - | - | - |
| By Spouse and/or Minor | - | - | - |
| 8. Pol. Gen. Aek Angsanant | - | - | - |
| By Spouse and/or Minor | - | - | - |
| 9. Mr. Yongyut Jantararotai | - | - | - |
| By Spouse and/or Minor | - | - | - |
| 10. Gen. Kukiat Srinaka | N/A | - | N/A |
| By Spouse and/or Minor | N/A | - | N/A |
| 11. Mr. Praphon Wongtharua | N/A | - | N/A |
| By Spouse and/or Minor | N/A | - | N/A |
| 12. Ms. Phannalin Mahawongtikul | - | - | - |
| By Spouse and/or Minor | - | - | - |
| 13. Mr. Preecha Pocatanawat | N/A | - | N/A |
| By Spouse and/or Minor | N/A | - | N/A |

| Name-Surname | No. of Shares/Changes | | No. of Shares Addition (Reduction) During the Year |
|--|-----------------------|--------------------|--|
| | as of Dec 31, 2018 | as of Dec 31, 2019 | |
| 14. Ms. Duangporn Thiengwatanatham | 600 | 600 | - |
| By Spouse and/or Minor | - | - | - |
| 15. Mr. Wirat Uanarumit | N/A | - | N/A |
| By Spouse and/or Minor | N/A | - | N/A |
| Directors who Resigned and Completed the Term during the Year 2019 | | | |
| 1. Mr. Suchalee Sumamal | - | - | - |
| By Spouse and/or Minor | - | - | - |
| 2. Mr. Noppadol Pinsupa | - | - | - |
| By Spouse and/or Minor | - | - | - |
| 3. Mr. Chen Namchaisiri | - | - | - |
| By Spouse and/or Minor | - | - | - |
| 4. Mr. Atikom Terbsiri | - | - | - |
| By Spouse and/or Minor | - | - | - |
| Company's High-Level Executives | | | |
| 1. Mr. Wirat Uanarumit | N/A | - | N/A |
| Chief Executive Officer and President | | | |
| By Spouse and/or Minor | N/A | - | N/A |
| 2. Mr. Bandhit Thamprajamchit | 7,200 | 7,200 | - |
| Senior Executive Vice President | | | |
| Refinery and Petrochemical | | | |
| and Executive Vice President | | | |
| Operation Excellence (Act.) | | | |
| By Spouse and/or Minor | - | - | - |
| 3. Mr. Jeerawat Pattanasomsit | - | - | - |
| Executive Vice President Manufacturing | | | |
| By Spouse and/or Minor | - | - | - |
| 4. Mr. Chatapong Wungtanagorn | 97,400 | 97,400 | - |
| Executive Vice President | | | |
| Corporate Commercial | | | |
| By Spouse and/or Minor | - | - | - |

| Name-Surname | No. of Shares/Changes | | No. of Shares Addition (Reduction) During the Year |
|--|-----------------------|--------------------|--|
| | as of Dec 31, 2018 | as of Dec 31, 2019 | |
| 5. Mr. Charlee Balmongkol Executive Vice President CFP Project Director By Spouse and/or Minor | - - - | - - - | - - - |
| 6. Mr. Pongpun Amornvivat Executive Vice President Strategy and Executive Vice President Innovation and Digitalization (Act.) By Spouse and/or Minor | 17,100 - - | 17,100 - - | - - - |
| 7. Ms. Pattaralada Sa-Ngasang Executive Vice President Finance and Accounting By Spouse and/or Minor | - - - | - - - | - - - |
| 8. Mr. Viroj Meenaphant Executive Vice President Corporate Governance and Affairs and Company Secretary By Spouse and/or Minor | N/A N/A | - - | N/A N/A |
| 9. Mr. Viroj Wongsathirayakhun Executive Vice President Organization Effectiveness By Spouse and/or Minor | 21,600 - - | 21,600 - - | - - - |
| 10. Mr. Surachai Saengsamran Executive Vice President CFP Project Sponsor By Spouse and/or Minor | 98,500 - - | 98,500 - - | - - - |
| 11. Ms. Tarika Devahastin Vice President Financial Planning By Spouse and/or Minor | N/A N/A | - - | N/A N/A |
| 12. Mr. Nikom Kongnok Vice President Accounting By Spouse and/or Minor | - - - | - - - | - - - |
| 13. Ms. Rungtip Maneesarachun Vice President Treasury By Spouse and/or Minor | - - - | - - - | - - - |

Remark: N/A means no information since the director or executive was appointed, resigned, or completed the term during the year 2019

Structure of the Board of Directors

According to the Company's Articles of Association, the Board of Directors shall consist of at least five members and not more than 15 members. Not less than half of the number of such director must reside in the Kingdom of Thailand. A director needs not be a shareholder of the Company.

Appointment and Termination of Directors

The nomination, appointment, removal, and termination of directors are prescribed in the Company's Articles of Association, which can be summarized as follows:

Appointment of Directors

The appointment of directors must be explicitly made at the Annual General Meeting of Shareholders under the following criteria and procedures:

1. Each shareholder shall have one (1) vote for one (1) share;
2. Each shareholder may exercise all the votes he or she has under 1. to elect one or several persons as directors, but the shareholder cannot divide his or her votes to any person in any number;
3. The indicated number of nominees who receive the largest number of votes in descending order shall be elected. In the event of the number of nominees receiving equal votes exceeds the number of vacancies to be filled, the chairman of the meeting shall cast the decisive vote.

Since 2007, the Board of Directors has adopted a resolution to allow minor shareholders' nomination of qualified director candidates, which must be explicitly made before the AGM and under the Company's nomination criteria. However, in the 2019 AGM, there was no nomination proposed by minor shareholders (see details in Corporate Governance Policy Section on page 139).

Removal and Termination of Directors

1. At every Annual General Meeting of Shareholders, one-third (1/3) of the directors, or, if the number of directors cannot be divided exactly into three parts, the number of directors nearest to one-third shall vacate office. A vacating director may be eligible to re-election. The directors to vacate office in the first and second years following the registration of the conversion of the company shall be drawn by lots. In subsequent years, the directors who have remained in office for the longest time shall vacate office.
2. Apart from completing the term, a director shall vacate office upon death, resignation, lack of qualifications or disqualifications under the law pertaining to Public Company Limited and/or under the Securities and Exchange Act, removal pursuant to resolution passed at the shareholders meeting, or removal pursuant to a court order.
3. To resign from office, a director has to hand in his resignation letter. Such resignation shall become effective on the date it reaches the company. The director who has resigned may also inform the registrar of the facts.
4. The shareholders' meeting may pass a resolution to remove any director from office prior to the term completion, by the vote of not less than three-fourths (3/4) of the number of shareholders attending the meeting and having the right to vote and the shares held by them shall, in aggregate, be not less than half of the number of shares held by the shareholders attending the meeting and having the right to vote.
5. In the event that a position of director becomes vacant for any reason other than the completion of his office term, the Board of Directors shall on the next Board meeting appoint a qualified person, not having

unacceptable qualities under the laws pertaining to Public Company Limited and the Securities and Exchange Act to be a new director, except if such office term remaining is less than two (2) months. The replacement director shall hold office only for the remainder of the office term of the director whom he replaces. The resolution of the Board of Directors must be approved by the votes of not less than three-fourths of the number of the remaining directors.

Authorized Directors

According to the Company's Articles of Association,

1. The Chief Executive Officer and President or 2. Two (2) authorized directors shall sign with affixation of the Company's seal to represent the Company. The Board of Directors has the right to prescribe and rectify the list of the Company's authorized directors.

Through the Board of Directors Meeting No. 5/2019 on Friday, June 21, 2019, the Board of Directors has approved directors having authority to sign on behalf of the Company, namely Mr. Wirat Uanarumit, Chief Executive Officer and President, signing with affixation of the Company's seal; or, Ms. Duangporn Thiengwatanatham, Ms. Phannalin Mahawongtikul, and Mr. Auttapol Rerkpiboon, any two of the three representative directors jointly sign together with the affixation of the Company's seal. This is effective as of September 1, 2019.

Board of Directors Roles and Responsibility

Observing Company's regulations, the Board of Directors is authorized to conduct roles and responsibilities under the law, Company's objectives, regulations, and resolutions approved by shareholders' meetings. Directors must observe the "Code of Practice for Directors of Listed Companies" stipulated by Stock Exchange of Thailand (SET) with integrity and prudence to protect the Company's interests and maximize profits for its shareholders. To enable employees to observe the business principles and

establish credibility among shareholders and investors, the Company has defined the following roles and responsibilities for the Board of Directors:

1. Define the business vision and be responsible for the Company's and executives' performance outcomes to give the business long-term continuity and provide for employees' development plans and executives' continuity;
2. Review and endorse significant strategies and policies with a focus on business objectives, financial targets, risks, work programs and budgets, and ensure that the management efficiently and effectively follow policies and plans;
3. Review and endorse actions required by law, and serve as leaders/role models for performance, compliance with the law, and alignment with corporate governance guidelines;
4. Provide assurance of the accounting system, financial reporting, and audits by efficiently and effectively forging processes for suitable internal control and audit, and oversee financial reporting and monitoring progress;
5. Institute a corporate risk management policy by seeking quarterly risk management reports from the management via the Audit Committee, and encouraging the Company to conduct risk management system assessment at least once a year, while paying due attention to warning signs and anomalies;
6. Oversee and resolve potential conflicts of interest and connected transactions, and set practical guidelines to prevent them with a focus on maintaining the best interests of the shareholders and stakeholders at large; institute transaction guidelines prohibiting stakeholders with vested interests from decision-making on such matters; and establish standard procedures

and thorough information disclosure of all potential conflicts of interest;

7. Promote a written code of conduct for directors, executives, and employees to ensure full understanding of the Company's business standards, including earnest, periodic follow-ups of compliance;
8. Conduct the annual performance appraisal and decide compensation for the Chief Executive Officer and President.

Chairman Roles and Responsibilities

Stated in the Corporate Governance and Code of Conduct Manual, roles and responsibilities of the Chairman of the Board (the Chairman) are as follows:

1. By oneself or assign a delegate, calls the meetings of the Board of Directors with meeting notices sent at least seven days prior to the meeting date so that the directors may have adequate time to study, review, and make proper decisions;
2. Jointly with the Chief Executive Officer and President, defines the agenda of each meeting;
3. Ensures the efficiency of each meeting by allocating enough time for the executives to present information, encouraging and allowing directors' queries and expression of free views, controlling the issues under discussion, and summarizing the meeting's resolutions;
4. Plays a key role in encouraging the Board of Directors' conformance to corporate governance principles, including identifying themselves, refraining from voting, and leaving the meeting in case of having conflicts of interest in any agenda;
5. Informs the Board of Directors all significant matters;
6. Encourages the Board of Directors to attend shareholders' meetings and presides over such meetings to ensure the meeting efficiency and address shareholders' queries;

7. Encourages the Board of Directors to perform their duties under the scope of authority given by laws, and the corporate governance.

Chief Executive Officer and President (CEO and President) Roles and Responsibilities

Assigned by the Board of Directors to conduct the Company business under the approved plans and budgets with rigor and integrity, while protecting the best interests of the Company and its shareholders, the Chief Executive Officer and President must not be engaged in any conflicts of interest with Thailoil and Subsidiaries. His roles and responsibilities consist of the following:

1. Prepares and proposes to the Board of Directors five-year and 10-year business plans, including the Company's strategic imperatives;
2. Prepares and provides to the Board of Directors information relevant to the Company business and activities, as well as other information needed;
3. Manages the Company business and activities under the approved plans and budgets, as well as business strategies;
4. Structures and manages the organization under guidelines given by the Board of Directors;
5. Fine-tunes the Company's POSITIVE culture in support of its vision, mission, and strategic imperatives;
6. Executes all other tasks assigned by the Board of Directors;
7. Delegates authority and/or assigns others to act on his or her behalf, or both, under the rules, terms, principles, and orders given by the Board of Directors or the Company, or both;
8. Prepares and presents the significant company business performance and activity reports as well as other reports required by the Board of Directors;
9. Represents the Company in external contacts.

Meeting Attendance of Board of Directors, Board-Committees, and 2019 Annual General Meeting of Shareholders

| Name-Surname | Position | Board of Directors Meeting (12 times) | Audit Committee Meeting (8 times) | Nomination and Remuneration Committee Meeting (5 times) | Corporate Governance Committee Meeting (6 times) | Risk Management Committee Meeting (6 times) | Annual General Meeting of Shareholders (AGM) (1 time) | Independent Directors Meeting (1 time) | Non-Executive Directors Meeting (1 time) |
|--|--|---------------------------------------|-----------------------------------|---|--|---|---|--|--|
| 1 Prof. Dr. Thosaporn Sirisumphand | Director and Chairman of the Board | 12/12 | | | | | 1/1 | | 1/1 |
| 2 Mr. Kanit Si ⁽¹⁾ | Independent Director | 12/12 | 3/3 | | 3/3 | | 1/1 | 1/1 | 1/1 |
| 3 Ms. Chularat Suteethorn ⁽²⁾ | Director and Member of the Risk Management Committee | 11/ 12 | 5/5 | 5/5 | | 2/2 | 1/1 | 1/1 | 1/1 |
| 4 Assoc. Prof. Dr. Pasu Decharin ⁽³⁾ | Independent Director, Member of the Audit Committee and Member of the Nomination and Remuneration Committee | 10/12 | 8/8 | 0/0 | | | 1/1 | 0/1 | 0/1 |
| 5 Mr. Praphaisith Tankeyura ⁽⁴⁾ | Independent Director and Member of the Audit Committee | 4/4 | 3/3 | | | | N/A | | 1/1 |
| 6 ACM Suttipong Inseeyong | Independent Director and Chairman of the Nomination and Remuneration Committee | 12/12 | | 5/5 | | | 1/1 | 1/1 | 1/1 |
| 7 Mr. Autapol Rerkpiboon ⁽⁵⁾ | Director, Chairman of the Risk Management Committee and Member of the Nomination and Remuneration Committee | 11/ 12 | | 5/5 | | 6/6 | 1/1 | | 1/1 |
| 8 Pol. Gen. Aek Angsanaront | Independent Director and Chairman of the Corporate Governance Committee | 12/12 | | | 6/6 | | 1/1 | 1/1 | 1/1 |
| 9 Mr. Yongyut Jantaradai | Director and Member of the Corporate Governance Committee | 11/ 12 | | | 6/6 | | 1/1 | | 1/1 |
| 10 Gen. Kukiat Smaka ⁽⁶⁾ | Corporate Governance Committee Independent Director and Member of the Corporate Governance Committee | 11/12 | 2/2 | | 3/3 | | 1/1 | 0/1 | 1/1 |
| 11 Mr. Praphon Wongtharua ⁽⁷⁾ | Director | 10/11 | | | | 6/6 | 1/1 | | 1/1 |
| 12 Ms. Phannalin Mahawongtikul | Director and Member of the Risk Management Committee | 12/12 | | | | | 1/1 | | 1/1 |
| 13 Mr. Preecha Pochanawat ⁽⁸⁾ | Risk Management Committee Director | 8/8 | | | | | N/A | | 1/1 |
| 14 Ms. Duangporn Thiengwatanatham | Director | 12/12 | | | | | 1/1 | | 1/1 |
| 15 Mr. Wirat Uanarunit ⁽⁹⁾ | Director, Member of the Risk Management Committee, Chief Executive Officer and President and Secretary to the Board | 4/4 | | | | 3/3 | N/A | | 1/1 |
| Directors who resigned during the year 2019 | | | | | | | | | |
| 1 Mr. Suchalee Sumamal | Director (Resigned effective as of January 1, 2019) | N/A | | | | | N/A | | N/A |
| 2 Mr. Noppadol Pirsupa | Director and Member of the Risk Management Committee (Resigned effective as of January 31, 2019) | 1/1 | | | | 1/1 | N/A | N/A | N/A |
| 3 Mr. Chen Namchaisiri | Independent Director and Member of the Audit Committee | 3/3 | 3/3 | | | | 1/1 | N/A | N/A |
| 4 Mr. Atikom Terbsiri | Director, Member of the Risk Management Committee, Chief Executive Officer and President and Secretary to the Board (Resigned effective as of September 1, 2019) | 8/8 | | | | 3/3 | 1/1 | N/A | N/A |
| Average Meeting Attendance of Board of Director (%) | | 96 | 100 | 100 | 100 | 100 | 100 | | |

Remark:

N/A means not attend since the director resigned or was appointed during the year 2019.

- (1) Appointed as Member of the Corporate Governance Committee in the Board of Directors Meeting no. 4/2019 on May 31, 2019 and vacated from Member of the Corporate Governance Committee on September 20, 2019. Appointed as Member of the Audit Committee in the Board of Directors Meeting no. 7/2019 on August 30, 2019, effective from September 20, 2019 and elected as Chairman of the Audit Committee in the Audit Committee Meeting no. 5/2019 on September 20, 2019
- (2) Vacated from Independent Director on September 20, 2019 and appointed as member of the Risk Management Committee in the Board of Directors Meeting no. 7/2019 on August 30, 2019, effective from September 20, 2019
- (3) Appointed as Member of Nomination and Remuneration Committee in the Board of Directors Meeting no. 7/2019 on August 30, 2019, effective from September 20, 2019
- (4) Appointed as Independent Director and member of Audit Committee in the Board of Directors Meeting no. 7/2019 on August 30, 2019, effective from September 1, 2019 and September 20, 2019 respectively
- (5) Term completed and re-elected as Independent Director in the 2019 Annual General Meeting of Shareholders on April 10, 2019. Appointed as Member of the Nomination and Remuneration Committee and Member of Risk management committee in the Board of Directors Meeting no. 4/2019 on May 31, 2019 and elected as Chairman of the Risk Management Committee in the Risk Management Committee Meeting no. 2/2019 on June 11, 2019
- (6) Appointed as Independent Director in the Board of Directors Meeting no. 11/2018 on November 23, 2018, effective from January 1, 2019. Term completed and re-elected as Independent Director in the 2019 Annual General Meeting of Shareholders on April 10, 2019. Appointed as Member of the Audit Committee in the Board of Directors Meeting no. 6/2019 on July 19, 2019 and vacated from Member of the Audit Committee on September 19, 2019. Appointed as Member of the Corporate Governance Committee in the Board of Directors Meeting no. 7/2019 on August 30, 2019, effective from September 2019
- (7) Appointed as director in the Board of Directors Meeting no. 2/2019 on February 15, 2019
- (8) Appointed as director in the 2019 Annual General Meeting of Shareholders on April 10, 2019.
- (9) Appointed as director, Member of the Risk Management Committee and Chief Executive Officer and President in the Board Meeting no. 5/2019 on June 21, 2019, effective from September 1, 2019.

Information of Directors, Executive Officers and Control Executives as of December 31, 2019

| | | Subsidiaries | | | | | | | | | | Indirect Subsidiaries | | | | | | | | | | Jointly-Controlled Entity of Subsidiaries | | | | Associates | | | | Related Companies | | | | |
|---------------------------------|----------|--------------------|---------------------------|-----------------------|--------------------------------|------------------------|------------------------|----------------------|---|-------------------|-----------------------|--|--|-------------------------------------|---------------------------------|--|---|---|--------------------------------|--|---|---|-------------------------------------|--|---|---|---------------------------------|--------------------------------|--|--------------------------------------|--|---|--|--|
| Name | Thai Oil | Thai Lube Base Plc | Thai Paraxylene Co., Ltd. | Thai Marine Co., Ltd. | Thai Energy Services Co., Ltd. | Thai Solvent Co., Ltd. | Thai Ethanol Co., Ltd. | Thai Power Co., Ltd. | Thai Treasury Center Co., Ltd. ⁽¹⁾ | TOP SPP Co., Ltd. | TOP Solvent Co., Ltd. | Sak Chaisidhi Co., Ltd. ⁽²⁾ | TOP Solvent (Vietnam) LLC ⁽³⁾ | PT. Tirta Surya Raya ⁽⁴⁾ | Saphip Co., Ltd. ⁽⁵⁾ | Saphip Green Energy Co., Ltd. ⁽⁶⁾ | Thaioil Marine International Pte. Ltd. ⁽⁷⁾ | TOP Maritime Service Co., Ltd. ⁽⁸⁾ | Labix Co., Ltd. ⁽⁹⁾ | TOP Ventures Co., Ltd. ⁽¹⁰⁾ | TOP Ventures Hong Kong Ltd. ⁽¹¹⁾ | TOP Ventures America LLC ⁽¹²⁾ | TOP - VTL Co., Ltd. ⁽¹³⁾ | TOP - VTL Shipping Trust ⁽¹⁴⁾ | TOP - VTL Nautical Star Co., Ltd. ⁽¹⁵⁾ | TOP-NYK MarineOne Pte. Ltd. ⁽¹⁶⁾ | PTT Digital Solutions Co., Ltd. | PTT Energy Solutions Co., Ltd. | Global Power Synergy Plc ⁽¹⁷⁾ | Ubon Bio Ethanol Plc ⁽¹⁸⁾ | TJM Ship Management (Thailand) Co., Ltd. ⁽¹⁹⁾ | Thai Petroleum Pipeline Co., Ltd. ⁽²⁰⁾ | Sam Palung Social Enterprise Co., Ltd. ⁽²¹⁾ | |
| 28 Mr. Naitapong Tumsaroj | ✱ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 Mr. Nittapon Meent | ✱ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 Ms. Duangporn Teerapabpaisit | ✱ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 Ms. Tonsang Chalpravat | ✱ | | | | | | ✱ | | ✱ | | | | | | | ✱ | | | | | | | | | | | | | | | | | | |
| 32 Ms. Tanika Devathasin | ✱ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 Mr. Nikom Kongnok | ✱ | | | | | | | | | | | ✱ | | | | | | | | | | | | | | | | | | | | | | |
| 34 Mr. Nitas Kongvanichayakul | ✱ | | | ✱ | | | | | | | | | | | | | | ✱ | | | | | | | ✱ | | | | | | | | ✱ | |
| 35 Ms. Prapin Thongnium | ✱ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 Mr. Phumchit Taisanaprasert | ✱ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 Mr. Mongkol Janchookiat | ✱ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 Ms. Rungtip Maneesarachun | ✱ | ✱ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 Ms. Rungnapa Janchookiat | ✱ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 Mr. Saruny Limwongse | ✱ | ✱ | ✱ | ✱ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 Ms. Somporn Bunluesruang | ✱ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 42 Mr. Santi Wasanasiri | ✱ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 43 Ms. Suchada Deechaiya | ✱ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 44 Ms. Sudarat Orrattanasakul | ✱ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 45 Ms. Suwimol Chaluyadumrong | ✱ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 46 Mr. Anawat Charasaksoong | ✱ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 47 Ms. Acharee Tiyyabhorn | ✱ | | | ✱ | | | ✱ | | | | | ✱ | ✱ | ✱ | | | | | | | | | | | | | | | | | | | | |
| 48 Mr. Udom Wongsinoppakhun | ✱ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Notes: ✱ = Chairman ✱ = Director ✱ = Chief Executive Officer or Managing Director ✱ = Executive Officer

⁽¹⁾ Thaioil Treasury Center Co., Ltd. founded on September 29, 2017, is a subsidiary of Thai Oil Plc, in which Thaioil holds 100% of shares.
⁽²⁾ TOP Solvent Co., Ltd. is a subsidiary of Thaioil Solvent Co., Ltd. (TOS), in which TOS holds 100% of shares.
⁽³⁾ Sak Chaisidhi Co., Ltd. is a subsidiary of TOP Solvent Co., Ltd. (TS), in which TS holds 80.52% of shares.
⁽⁴⁾ TOP Solvent (Vietnam) LLC. is a subsidiary of TOP Solvent Co., Ltd. (TS), in which TS holds 100% of shares.
⁽⁵⁾ PT. Tirta Surya Raya is a subsidiary of TOP Solvent Co., Ltd. (TS), in which TS holds 67% of shares.
⁽⁶⁾ Saphip Co., Ltd. is a subsidiary of Thaioil Ethanol Co., Ltd. (TET), in which TET holds 50% of shares.
⁽⁷⁾ Saphip Green Energy Co., Ltd. is a subsidiary of Saphip Co., Ltd. (SAP), in which SAP holds 100% of shares.
⁽⁸⁾ Thaioil Marine International Pte. Ltd. is a subsidiary of Thaioil Marine Co., Ltd. (TM), in which TM holds 100% of shares.
⁽⁹⁾ TOP Maritime Service Co., Ltd. is a subsidiary of Thaioil Marine Co., Ltd. (TM), in which TM holds 75% of shares.
⁽¹⁰⁾ Labix Co., Ltd. is a subsidiary of Thai Paraxylene Co., Ltd. (TPX), in which TPX holds 100% of shares.
⁽¹¹⁾ TOP Ventures Co., Ltd. is a subsidiary of Thaioil Treasury Center Co., Ltd. (TTC), in which TTC holds 100% of shares.
⁽¹²⁾ TOP Ventures Hong Kong Ltd. is a subsidiary of Thaioil Treasury Center Co., Ltd. (TTC), in which TTC holds 100% of shares.
⁽¹³⁾ TOP Ventures America LLC. is a subsidiary of TOP Ventures Hong Kong Ltd. (TVHK), in which TVHK holds 100% of shares.
⁽¹⁴⁾ TOP-NTL Pte. Ltd. and TOP-NTL Shipping Trust is a jointly-controlled entity of Thaioil Marine Co., Ltd. (TM), in which TM holds 50% of shares.
⁽¹⁵⁾ TOP Nautical Star Co., Ltd. is a jointly-controlled entity of Thaioil Marine Co., Ltd. (TM), in which TM holds 35% of shares.
⁽¹⁶⁾ TOP-NYK MarineOne Pte. Ltd. is a jointly-controlled entity of Thaioil Marine International Pte. Ltd. (TOMI), in which TOMI holds 50% of shares.
⁽¹⁷⁾ Global Power Synergy Plc has become public company limited since 27 November 2014.
⁽¹⁸⁾ Ubon Bio Ethanol Plc is an associate company of Thaioil Ethanol Co., Ltd. (TET), in which TET holds 21.28% of shares, become Plc. on April 23, 2018
⁽¹⁹⁾ T.I.M. Ship Management (Thailand) Co., Ltd. is an associate company of Thaioil Marine Co., Ltd. (TM), in which TM holds 33% of shares.
⁽²⁰⁾ Thai Petroleum Pipeline Co., Ltd. is a related company of Thai Oil Plc, in which Thaioil holds 9.19% of shares.
⁽²¹⁾ Sam Palung Social Enterprise Co., Ltd. is a related company of Thai Oil Plc, in which Thaioil holds 15% of shares.

Management Team

As of December 31, 2019

| Name-Surname | Position |
|----------------------------------|--|
| 1. Mr. Wirat Uanarumit | Chief Executive Officer and President |
| 2. Mr. Bandhit Thamprajamchit | Senior Executive Vice President Refinery and Petrochemical and Executive Vice President Operation Excellence (Act.) |
| 3. Mr. Jeerawat Pattanasomsit | Executive Vice President Manufacturing and Vice President Refinery (Act.) |
| 4. Mr. Chatapong Wungtanagorn | Executive Vice President Corporate Commercial and Vice President Commercial Planning (Act.) |
| 5. Mr. Charlee Balmongkol | Executive Vice President CFP Project Director |
| 6. Mr. Pongpun Amornvivat | Executive Vice President Strategy and Executive Vice President Innovation and Digitalization (Act.) |
| 7. Ms. Pattaralada Sa-NGasang | Executive Vice President Finance and Accounting |
| 8. Mr. Viroj Meenaphant | Executive Vice President Corporate Governance and Affairs, Vice President Corporate Affairs (Act.) and Company Secretary |
| 9. Mr. Viroj Wongsathirayakhun | Executive Vice President Organization Effectiveness, Vice President People and Organization Management (Act.) and Vice President assigned as Managing Director, Thairoil Energy Services Co., Ltd. |
| 10. Mr. Surachai Saengsamran | Executive Vice President CFP Project Sponsor |
| 11. Mr. Jumpon Thapanapong | Vice President Corporate Resources and Transformation Management |
| 12. Mr. Chet Prongchit | Vice President Movement Marine and Logistic |
| 13. Mr. Narongsak Chaviengpob | Vice President Engineering |
| 14. Mr. Nattapong Tumsaroj | Vice President Business Development |
| 15. Mr. Nuttapon Meerit | Vice President Special Assignment assigned as CFP Process Manager |
| 16. Ms. Duangporn Teerapabpaisit | Senior Vice President-assigned as Managing Director, Labix Co., Ltd. |
| 17. Ms. Torsang Chaipravat | Vice President Strategic Planning and Vice President assigned as Managing Director, Thairoil Ethanol Co., Ltd. |
| 18. Ms. Tarika Devahastin | Vice President Financial Planning |
| 19. Mr. Nikom Kongnok | Vice President Accounting |
| 20. Mr. Nitas Krongvanitchayakul | Senior Vice President-assigned as Managing Director, Thairoil Marine Co., Ltd. |

| Name-Surname | Position |
|---------------------------------|---|
| 21. Ms. Prapin Thongnium | Vice President Corporate Internal Audit |
| 22. Mr. Phumchit Tatsanaprasert | Vice President Quality Management and Vice President Efficient Operations Support (Act.) |
| 23. Mr. Mongkol Janchookiat | Vice President Procurement and Contract |
| 24. Ms. Rungtip Maneesarachun | Vice President Treasury |
| 25. Ms. Rungrapa Janchookiat | Vice President Technology |
| 26. Mr. Sarunyu Limwongse | Vice President Petrochemical and Lube Base and Vice President assigned as Managing Director, Thai Lube Base Plc and Thai Paraxylene Co., Ltd. |
| 27. Ms. Somporn Bunluesiruang | Vice President Supply Chain Optimization |
| 28. Mr. Santi Wasanasiri | Vice President New S-curve Business Development |
| 29. Ms. Suchada Deechaiya | Vice President People and Organization Excellence |
| 30. Ms. Sudarat Orrattanasakul | Vice President Regulatory Compliance |
| 31. Ms. Suwimol Chaluaydumrong | Vice President Corporate Governance and Sustainability |
| 32. Mr. Anawat Chansaksoong | Vice President Commercial |
| 33. Ms. Acharee Tiyaabhorn | Vice President assigned as Managing Director, Thaioil Solvent Co., Ltd. and TOP Solvent Co., Ltd. |
| 34. Mr. Udom Wongsirinopphakhun | Vice President Asset Development and Vice President assigned as Managing Director, Thaioil Power Co., Ltd. and TOP SPP Co., Ltd. |

Company Secretary

The Board of Directors appointed the Company Secretary to take responsibilities in providing advices to the Board and executives regarding the applicable laws and regulations that the Board must recognize and act upon, the corporate governance policies as well as the arrangement of the Board meetings and the Annual General Meeting of Shareholders. The Company Secretary

must monitor and coordinate to ensure that the Board and shareholders' resolutions are fully complied. The Company Secretary is also assigned to keep the Company's important documents as required by the laws. In the Board of Directors Meeting no. 9/2018 held on September 28, 2018, the Board of Directors passed the resolution on appointing Mr. Viroj Meenaphant as the Company Secretary, effective from October 1, 2018.

Brief Biography

Name: Mr. Viroj Meenaphant
Education: Bachelor of Engineering
(Chemical Engineering),
Chulalongkorn University

Working Experience in the 5 Preceding Years

| | |
|-------------------|--|
| May 2013-Jan 2015 | Assistant Executive Vice President-Corporate Governance (Act.); Vice President-Corporate Affair (Act.); Manager-CSR Strategy (Act.); and Company Secretary |
| Feb-Apr 2015 | Assistant Executive Vice President-Corporate Governance; Vice President-Corporate Affair (Act.); Manager-CSR Strategy (Act.); and Company Secretary |
| May 2015-Sep 2018 | Assistant Executive Vice President-Corporate Governance |
| Oct-Dec 2018 | Assistant Executive Vice President-Corporate Governance and Company Secretary |
| Jan 2019 | Executive Vice President Corporate Governance and Affairs (Act.) and Company Secretary |
| Feb-June 2019 | Executive Vice President Corporate Governance and Affairs (Act.) Vice President Corporate Affairs (Act.); and Company Secretary |
| Jul 2019-Present | Executive Vice President Corporate Governance and Affairs; Vice President Corporate Affairs (Act.); and Company Secretary |

Company Secretary Training:

Thai Institute of Directors (IOD)

- >> Company Secretary Program (CSP 31/2009)
- >> Director Certification Program (DCP 185/2014)
- >> Thailand's 10th National Conference 2019: Collective
Action against Corruption "Innovation in the Fight
against Corruption"
- >> Company Secretary Forum 2019: Role of the Company
Secretary in Shaping Corporate Culture

Other Institutes

- >> Leadership Development Program (LDP) II (2018)
- >> Politics and Government in Democracy for Senior
Management, Class 19, King Prajadhipok's Institute
- >> Executive Development Program (EDP), Thai Listed
Companies Association (TLCA)

Chief of the Internal Audit: Vice President Corporate Internal Audit

The appointment, removal, and replacement of the
Chief of the Internal Audit Unit must be considered and
approved by the Audit Committee. The Committee also
assesses the performance of the Chief of the Internal
Audit against the responsibilities indicated in the Audit
Committee Charter.

In the Audit Committee Meeting no. 12/2014 on
December 17, 2014, the Committee appointed
Ms. Prapin Thongnium as the Chief of the Internal Audit
Unit due to qualified knowledge, competency, experience,
and continuous improvement through various trainings.

Brief Biography

Name: Ms. Prapin Thongnium

Education: >> Bachelor of Accounting,
Thammasat University
>> Master of Business Administration,
Burapha University

Working Experience in the 5 Preceding Years

2007-2014 Vice President-Accounting
2015-Present Vice President-Corporate Internal Audit

Training:

Thai Institute of Directors (IOD)

>> Board Reporting Program (BRP 21/2016)
>> Anti-Corruption: The Practical Guide (ACPG 46/2018)

Other Institutes

>> Security Bangkok 2019: Cyber Security and Risk Summit
>> Data Governance Framework and Guidelines (DGF) by ACIS
>> IIA Thailand Annual Conference 2019-Indispensable IA : Insightful Agile and Innovation, The institution of Internal Auditors of Thailand
>> Asian Confederation of Institutes of IA (ACIIA 2019)-Towards Sustainable Management in a new ERA, Japan
>> ISACA Annual Conference 2019-Crafting the Cybersecurity Excellence
>> Enterprise AI Conference 2019
>> The 17th Cyber Defense Initiative Conference 2018 (CDIC 2018)
>> Digital Forensics Foundation
>> IT Risk Management Using Concept from CRISC
>> Enterprise IT Governance for Internal Auditor
>> Quality Assurance and Improvement Program (QAIP)

>> Practical Fraud Detection Investigation and Litigation (Corruption Employee Case)
>> PwC Thailand 2018 Symposium : Managing Challenges to Unleash Corporate Growth
>> Value Creation and Enhancement for Listed Company with the New COSO 2017 Enterprise Risk Management
>> Crossover Thailand 4.0
>> IA Day: Connecting the World
>> CAE Forum 2018: Digitalization Empower IA New Gen
>> Transforming IA for the Digital Age
>> Cyber Security 4.0 for Accountants and Auditors
>> Cyber Security Fundamental
>> CRISC® Preparation Program
>> Audit Program Development
>> Sampling for Internal Auditors
>> Leading Culture with Adaptive Mindset Workshop
>> Using COSO 2013 In Practice, IA Profession Practice, Risk - Based IA Plan, Proactive & Updated Techniques
>> Internal Audit Methodology, Transforming IA and Challenges In Oil and Gas Industry and Experience Sharing In Best Practice
>> Practical Fraud Prevention, Detection & Investigation Strategies
>> TLCA Executive Development Program (EDP)
>> Financial Executive Development Program (FINEX)
>> Study and Visit the Internal Audits of Leading Public Companies

Chief of the Compliance:

Vice President Regulatory Compliance

The Company appointed Ms. Sudarat Orrattanasakul as Vice President Regulatory Compliance, responsible for law and regulatory compliance, effective from January 1, 2019.

Brief Biography

Name: Ms. Sudarat Orrattanasakul
Education: >> Bachelor of Business Administration,
Assumption University
>> Master of Business Administration
(International Program)
Bangkok University

Working Experience in the 5 Preceding Years

Jan 2015-Dec 2018 Vice President-Commercial
Planning
Jan 2019-Present Vice President
Regulatory Compliance

Training:

Thai Institute of Directors (IOD)

>> Director Certification Program (DCP 249/2017)
>> Financial Statements for Directors (FSD 36/2018)

Other Institutes

>> Leadership Development Program (LDP) II (2018)

Person Taking the Highest Responsibility in Finance and Accounting and Person Supervising Accounting

Person Taking the Highest Responsibility in Finance and Accounting: Executive Vice President Finance and Accounting

Brief Biography

Name: Ms. Pattaralada Sa-Ngasang
Education: >> Bachelor of Accounting,
Thammasat University
>> Mini Master of Business
Administration, National Institute of
Development Administration
>> Master of Business Administration,
Thammasat University

Working Experience in the 5 Preceding Years

Jan 2013-Jan 2014 Vice President Strategic Planning
Feb-Sep 2015 Senior Vice President-Financial
Planning
Oct 2015-Present Executive Vice President
Finance and Accounting

Training:

Thai Institute of Directors (IOD)

>> Director Certification Program (DCP 151/2011)
>> Role of the Chairman Program (RCP 39/2016)
>> Strategic Board Master Class (SBM 1/2017)

Other Institutes

>> Executive Development Program (EDP),
Thai Listed Companies Association
>> Executive Finance Management Program,
Economics and Finance Academy
>> IMD - TLCA Leadership Development Program (LDP)
>> PTT - HBS Leadership Development Program (HBS)

- >> Capital Market Academy Leader Program, Capital Market Academy
- >> Global Leadership Business
- >> National Defence Course, National Defence College
- >> Lecturer to Certification in Investor Relations 2019 Program, Thai Listed Companies Association
- >> Lecturer to Strategic Financial Leadership Program (SFLP) 2019 on Beyond Accounting: Strategies to improve performance and financial management for sustainable success, Thai Listed Companies Association
- >> Lecturer to Strategic CFP in Capital Market Program, Class 8, on CFO and Investor Relations, Sustainability Issues, Thailand Security Institute, Stock Exchange of Thailand
- >> Lecturer to Orientation Course-CFO Focus on Financial Reporting, Class 8, the Federation of Accounting Professions under the Royal Patronage of His Majesty the King

Person Supervising Accounting:

Vice President Accounting

Name: Mr. Nikom Kongnok

Education: >> Bachelor of Accounting (Honor), Chiang Mai University
>> Master of Business Administration, Finance, and Banking, Sripatum University

Working Experience in the 5 Preceding Years

| | |
|-------------------|--|
| Jul 2013-Jan 2015 | Manager-Human Resource Compensation and Information System |
| Feb-Aug 2015 | Vice President-Account (Act.) |
| Sept 2015-Present | Vice President Account |

Training:

Thai Institute of Directors (IOD)

- >> Director Certification Program (DCP 244/2017)
- >> Advanced Audit Committee Program (AACP 29/2018)
- >> Company Secretary Program (CSP 88/2018)
- >> Risk Management Program for Corporate Leaders (RCL 16/2019)
- >> Role of the Chairman Program (RCP 45/2019)

Other Institutes

- >> Mergers and Acquisitions 2016 - Financial, Legal, Tax & Commercial Strategies
- >> Certification in Tax Law and International Tax Law
- >> Chief Financial Officer Certification Program
- >> Financial Executive Development Program, Class 25 (FINEX XXV)
- >> Leadership Development Program I & II, Thai Oil Plc
- >> Synergy for Management, Class 5, Institute of Research and Development for Public Enterprises
- >> Training Course on Government Fiscal Management for Executives, Class 6, Comptroller General Department
- >> Advanced Management Program II, PTT Plc and CELEMI
- >> Strategic Financial Leadership Program (SFLP) 2018, Thai Listed Companies Association
- >> Impacts of New Thailand's Financial Reporting Standard on Financial Reporting Preparation of Listed Company, Securities and Exchange Commission
- >> Orientation Course-CFO Focus on Financial Reporting, Class 2/2018, Securities and Exchange Commission
- >> Leadership Development Program, Class 6, Thai Listed Companies Association
- >> Management Development Program, Class 26, Thailand Management Association

Person taking the highest responsibility in finance and accounting and person supervising accounting are qualified as required by Stock Exchange of Thailand, with education and experience relating to finance and/or accounting, and the continuous participation in training courses on accounting at least 6 hours per year.

Directors and Executives Remuneration

Directors Remuneration

The Annual General Meeting of Shareholders (AGM) in 2019 adjusted the monthly remuneration as well as meeting fee, to ensure the appropriateness by connecting more with the participation in meetings, and conformance with practices implemented by other organizations in the same industry. The 2019 adjusted remuneration is as follows:

2019 Remuneration Structure

| Retainer Fee | THB/Month |
|--|---------------------------|
| Chairman of the Board ⁽¹⁾ | 62,500 |
| Vice Chairman of the Board (if any) ⁽¹⁾ | 56,250 |
| Member of the Board | 50,000 |
| Per-Attendance Fee for Directors | |
| who attend the meeting | |
| Chairman of the Board ⁽¹⁾ | 50,000 THB/Meeting |
| Vice Chairman of the Board (if any) ⁽¹⁾ | 45,000 THB/Meeting |
| Member of the Board | 40,000 THB/Meeting |
| Board-Committees' Remuneration | |
| (Comprised of the Audit Committee, the Nomination and Remuneration Committee, the Corporate Governance Committee, the Risk Management Committee and others (If any)) | |
| | <u>Per-Attendance Fee</u> |
| Chairman of the Board-Committee ⁽¹⁾ | 56,250 THB/Meeting |
| Member of the Board-Committee | 45,000 THB/Meeting |
| Special Bonus for the Board ⁽²⁾ | 35 Million THB |

Remark:

- ⁽¹⁾ Chairman of the Board and Chairman of the Board-Committees shall receive retainer fee of 25% higher than the directors. Vice Chairman of the Board (if any) shall receive retainer fee of 12.5% higher than the directors.
- ⁽²⁾ The special bonus is for the Board of Directors in office in the year 2018 including those directors who resigned or whose term completed during 2018. The bonus is allocated due to each director's office period. The Chairman of the Board shall receive the bonus of 25% higher than the directors.

In summary, the remuneration of 23 directors, which included directors in office during 2019 for a period of 12 months ending as of December 31, 2019, and directors who completed their terms or resigned during the year 2019, totals THB 18.91 million. This comprises retainer fee for the Company Directors of THB 9.24 million, retainer fee for the Board-Committees of THB 3.78 million, and per-attendance fee of THB 5.89 million. In the 2019 Annual General Meeting of Shareholders on April 10, 2019, the shareholders passed the resolution for directors' remuneration in the form of a special bonus for 2018 performance of THB 35 million. The remuneration is considered through the comparison with organizations with equal size in the same industry, as well as the Company performance, the Board's performance, roles, and responsibilities, and the overall business circumstances. In addition, the Company provides vehicles for Chairman of the Board of Directors to facilitate during the Chairman on duty in office.

Directors Remuneration in 2019

| No. | Name-Surname | Position | Meeting Fee | Board of Directors Fee | Board-Committees | | | | (Baht) |
|--|--|---|---------------------|------------------------|---------------------|---------------------------------------|--------------------------------|---------------------------|----------------------|
| | | | | | Audit Committee | Nomination and Remuneration Committee | Corporate Governance Committee | Risk Management Committee | |
| 1 | Prof. Dr. Thosaporn Sirisumphant | Director and Chairman of the Board | 525,000.00 | 791,666.67 | - | - | - | - | 1,316,666.67 |
| 2 | Mr. Kanit Si ⁽²⁾ | Independent Director and Chairman of the Audit Committee | 420,000.00 | 633,333.33 | 168,750.00 | - | 128,333.33 | - | 1,350,416.67 |
| 3 | Ms. Chularat Sueethorn ⁽³⁾ | Director and Member of the Risk Management Committee | 420,000.00 | 633,333.33 | 272,916.67 | 218,333.33 | - | 90,000.00 | 1,634,583.33 |
| 4 | Assoc. Prof. Dr. Pesu Dechain ⁽⁴⁾ | Independent Director, Member of the Audit Committee and Member of the Nomination and Remuneration Committee | 300,000.00 | 633,333.33 | 353,333.33 | - | - | - | 1,286,666.67 |
| 5 | Mr. Praphaisith Tankeyura ⁽⁵⁾ | Independent Director and Member of the Audit Committee | 160,000.00 | 200,000.00 | 135,000.00 | - | - | - | 495,000.00 |
| 6 | ACM Suttipong Inseeyong | Independent Director and Chairman of the Nomination and Remuneration Committee | 420,000.00 | 633,333.33 | - | 272,916.67 | - | - | 1,326,250.00 |
| 7 | Mr. Auttapol Rekrakboon ⁽⁶⁾ | Director, Chairman of the Risk Management Committee and Member of the Nomination and Remuneration Committee | 380,000.00 | 633,333.33 | - | 218,333.33 | - | 385,416.67 | 1,617,083.33 |
| 8 | Pol. Gen. Aek Angsananon | Independent Director and Chairman of the Corporate Governance Committee | 420,000.00 | 633,333.33 | - | - | 329,166.67 | - | 1,382,500.00 |
| 9 | Mr. Yongyut Jantarotai | Director and Member of the Corporate Governance Committee | 380,000.00 | 633,333.33 | - | - | 263,333.33 | - | 1,276,666.67 |
| 10 | Gen. Kukiat Srinaka ⁽⁷⁾ | Independent Director and Member of the Corporate Governance Committee | 380,000.00 | 633,333.33 | 90,000.00 | - | 135,000.00 | - | 1,238,333.33 |
| 11 | Mr. Praphon Wongtharu ⁽⁸⁾ | Director | 380,000.00 | 543,333.33 | - | - | - | - | 923,333.33 |
| 12 | Ms. Phannalin Mahawongitkul | Director and Member of the Risk Management Committee | 420,000.00 | 633,333.33 | - | - | - | 308,333.33 | 1,361,666.67 |
| 13 | Mr. Preecha Pocatana ⁽⁹⁾ | Director | 360,000.00 | 433,333.33 | - | - | - | - | 793,333.33 |
| 14 | Ms. Duangporn Thengwatanatham | Director | 420,000.00 | 633,333.33 | - | - | - | - | 1,053,333.33 |
| 15 | Mr. Wirat Uanarumit ⁽¹⁰⁾ | Director, Member of the Risk Management Committee, Chief Executive Officer and President and Secretary to the Board | 160,000.00 | 200,000.00 | - | - | - | 135,000.00 | 495,000.00 |
| Directors who resigned during the year 2019 | | | | | | | | | |
| 1 | Mr. Suchalee Sumamal | Director (Resigned on January 1, 2019) | - | - | - | - | - | - | 2,461,820.11 |
| 2 | Mr. Noppadol Pinsupa | Director and Member of the Risk Management Committee (Resigned on January 31, 2019) | 20,000.00 | 58,064.52 | - | - | - | 24,193.55 | 102,258.07 |
| 3 | Mr. Chen Namchaisiri | Independent Director and Member of the Audit Committee (Resigned on May 10, 2019) | 60,000.00 | 249,462.37 | 128,333.33 | - | - | - | 437,795.70 |
| 4 | Mr. Alikom Tebsiri | Director, Member of the Risk Management Committee, Chief Executive Officer and President and Secretary to the Board (Resigned on September 1, 2019) | 260,000.00 | 433,333.33 | - | - | - | 128,333.33 | 821,666.67 |
| Directors who completed the term in 2018 AGM/resigned during the year 2018 (Received Annual Bonus for 2018 performance) | | | | | | | | | |
| 1 | Mr. Sarun Rungkasiri | Director, Chairman of the Risk Management Committee and Member of the Nomination and Remuneration Committee (Resigned on January 1, 2018) | - | - | - | - | - | - | - |
| 2 | Mrs. Suvimol Chrityakiern | Independent Director and Member of the Audit Committee (Completed term in AGM 2018) | - | - | - | - | - | - | 681,215.97 |
| 3 | Gen. Thanakarn Kerdmongkol | Independent Director and Member of the Audit Committee (Resigned on May 1, 2018) | - | - | - | - | - | - | 809,365.52 |
| 4 | Mrs. Nitima Thepvanangkul | Director, Member of the Risk Management Committee and Member of the Nomination and Remuneration Committee (Resigned on October 1, 2018) | - | - | - | - | - | - | 1,841,306.55 |
| 5 | Mrs. Sriwan Eamrungraj | Director and Member of the Risk Management Committee (Resigned on October 1, 2018) | - | - | - | - | - | - | 1,841,306.55 |
| Total | | | 5,885,000.00 | 9,242,526.89 | 1,148,333.33 | 709,583.33 | 855,833.33 | 1,071,276.88 | 18,912,553.77 |

Remark:

- ⁽¹⁾ Special Bonus for 2018 Company Performance as resolved by the 2019 Annual General Meeting of Shareholders (AGM) on April 10, 2019 paid to the directors on April 30, 2019
- ⁽²⁾ Appointed as Member of the Corporate Governance Committee in the Board of Directors Meeting no. 4/2019 on May 31, 2019 and vacated from Member of the Corporate Governance Committee on September 20, 2019. Appointed as Member of the Audit Committee in the Board of Directors Meeting no. 7/2019 on August 30, 2019 and elected as Chairman of the Audit Committee in the Audit Committee Meeting no. 5/2019 on September 20, 2019
- ⁽³⁾ Vacated from Independent Director on September 20, 2019 and appointed as member of the Risk Management Committee in the Board of Directors Meeting no. 7/2019 on August 30, 2019, effective from September 20, 2019
- ⁽⁴⁾ Appointed as Member of Nomination and Remuneration Committee in the Board of Directors Meeting no. 7/2019 on August 30, 2019, effective from September 20, 2019
- ⁽⁵⁾ Appointed as Independent director and member of Audit Committee in the Board of Directors Meeting no. 7/2019 on August 30, 2019, effective from September 1, 2019 and September 20, 2019 respectively
- ⁽⁶⁾ Term completed and re-elected as Independent Director in the 2019 Annual General Meeting of Shareholders on April 10, 2019. Appointed as Member of the Nomination and Remuneration Committee and Member of Risk management committee in the Board of Directors Meeting no. 4/2019 on May 31, 2019 and elected as Chairman of the Risk Management Committee Meeting no. 2/2019 on June 11, 2019
- ⁽⁷⁾ Appointed as Independent Director in the Board of Directors Meeting no. 11/2018 on November 23, 2018, effective from January 1, 2019. Term completed and re-elected as Independent Director in the 2019 Annual General Meeting of Shareholders on April 10, 2019. Appointed as Member of the Audit Committee in the Board of Directors Meeting no. 6/2019 on July 19, 2019 and vacated from Member of the Audit Committee on September 19, 2019. Appointed as Member of the Corporate Governance Committee in the Board of Directors Meeting no. 7/2019 on August 30, 2019, effective from February 15, 2019
- ⁽⁸⁾ Appointed as director in the Board of Directors Meeting no. 2/2019 on February 15, 2019
- ⁽⁹⁾ Appointed as director in the 2019 Annual General Meeting of Shareholders on April 10, 2019.
- ⁽¹⁰⁾ Appointed as director, Member of the Risk Management Committee and Chief Executive Officer and President in the Board Meeting no. 5/2019 on June 21, 2019, effective from September 1, 2019.

Subsidiaries' Directors Remuneration 2019

| | | | | | | (THB) |
|--|------------------------------------|------------------------------------|-----------------------------------|--|--|--------------------|
| No. | Name-Surname | Position | Thai Lube Base Plc ⁽¹⁾ | Thai Paraxylene Co., Ltd. ⁽²⁾ | Thaioil Power Co., Ltd. ⁽³⁾ | Total Remuneration |
| 1 | Mr. Wirat Uanarumit ⁽⁴⁾ | Director and Chairman of the Board | 76,050.00 | 75,300.00 | 115,625.00 | 266,975.00 |
| Director who resigned during the year 2019 | | | | | | |
| 2 | Mr. Atikom Terbsiri ⁽⁵⁾ | Director and Chairman of the Board | 187,500.00 | 187,500.00 | 250,000.00 | 625,000.00 |
| Total | | | 263,550.00 | 262,800.00 | 365,625.00 | 891,975.00 |

Remark:

⁽¹⁾ 2019 Annual General Meeting of Shareholders resolved to approve the 2019 remuneration; Chairman of the Board shall receive 22,500 Baht/month and director shall receive 18,000 Baht/month.

⁽²⁾ 2019 Annual General Meeting of Shareholders resolved to approve the 2019 remuneration; Chairman of the Board shall receive 22,500 Baht/month and director shall receive 18,000 Baht/month

⁽³⁾ 2019 Annual General Meeting of Shareholders resolved to approved the 2019 remuneration; Chairman of the Board shall receive 31,250 Baht/month and director shall receive 25,000 Baht/month

⁽⁴⁾ Appointed as director of Thai Lube Base Plc on September 6, 2019 and elected as Chairman of the Board on November 14, 2019.
Appointed as director of Thai Paraxylene Co., Ltd. on September 6, 2019 and elected as Chairman of the Board on November 19, 2019.
Appointed as director and elected as Chairman of the Board of Thaioil Power Co., Ltd. on September 10, 2019.

⁽⁵⁾ Resigned from Thai Lube Base Plc, Thai Paraxylene Co., Ltd. and Thaioil Power Co., Ltd., effective as of September 1, 2019.

Executives Remuneration

As of the fiscal year ended on December 31, 2019, the remuneration of 32 executives totalled to THB 241.92 million. This comprises of remuneration in the forms of month salaries and allowances of THB 152.97 million, special bonus of THB 47.08 million, provident fund contributions of THB 16.74 million, retirement gratuity fund payments of THB 15.96 million, and other payments of THB 9.17 million.

Remark:

>> The remuneration for 32 executives as of December 31, 2019, excludes the following executives who work in the subsidiary companies:

| | |
|------------------------------|--|
| Mr. Viroj Wongsathirayakhun | (partially included while divided by the proportion of the managing position of companies within Thaioil and Subsidiaries) |
| Ms. Duangporn Teerapabbaisit | |
| Ms. Torsang Chaipravat | (partially included while divided by the proportion of the managing position of companies within Thaioil and Subsidiaries) |
| Mr. Nitas Krongvanitchayakul | |
| Mr. Sarunyu Limwongse | (partially included while divided by the proportion of the managing position of companies within Thaioil and Subsidiaries) |
| Ms. Acharee Tiyaabhorn | |
| Mr. Udom Wongsirinopphakhun | (partially included while divided by the proportion of the managing position of companies within Thaioil and Subsidiaries) |



RISK FACTORS AND CORPORATE RISK MANAGEMENT

This year was remarkably challenging for Thailoil and Subsidiaries, since it was filled with uncertainties and swift change, all posing direct and indirect impacts on the corporate objectives and goals in the short term, medium term, and long term. Adjustment was therefore made by Thailoil and Subsidiaries to grapple with assorted situations and risk factors to maintain its competitiveness and forge business advantages for maximum risk management efficiency and minimum corporate risks and impacts. Thailoil and Subsidiaries have applied the international-standard risk management and developed risk management practices under the Committee of Sponsoring Organizations of the Treadway Commission Enterprise Risk Management 2017 (COSO ERM) and ISO 31000:2018 (Risk Management Principles and Guidelines) to embrace risk factors and implement throughout the Company. The practices focused on integrated management for Thailoil and Subsidiaries' risk management under the seven "Risk Appetites": namely, performance and investment; compliance; safety, occupational health and environment; reputation; fraud and corruption; ICT security; and the Clean Fuel Project (CFP) investment. The Company then links such risk appetites to the formulation of strategic plans, investment, and business plans to align with corporate objectives and goals. Thailoil also identified internal and external key risk factors associated with stakeholders' expectations, and which defined accommodating measures and plans for each factor, as well as key risks and early-warning Key Risk Indicators (KRIs), which are designed to closely monitor risk management and its outcomes. The outcomes were reported to the Risk Management

Steering Committee (RMSC), the Risk Management Committee (RMC), and the Board of Directors (the Board) to efficiently and effectively oversee risk management throughout the organization. In addition, Thailoil defines risk management as one of the Key Performance Indicators (KPIs) for the Vice President and the subsidiaries' Managing Director.

Today, various threats along with natural catastrophes tend to pose increasing severity, Thailoil has put in place the Business Continuity Management Plans (BCPs) for all critical and crucial support processes under ISO 22301:2012. Various simulated disasters are defined for BCP drills in conjunction with the refinery's regular emergency drills. Thailoil also encouraged sound knowledge and positive attitudes among employees to improve their caliber for risk management and Business Continuity Management (BCM) for their readiness to cope with risk factors by annually organizing employees' knowledge and attitude assessment that is thorough and in line with international standards as well as corporate governance. The latest employee engagement survey showed employees' high confidence in corporate risk management processes, which have helped the corporate risk management to achieve its goal, and contributed to a forge corporate risk culture.

Thailoil remains committed to sustainable growth by constantly developing the organization for integrated Governance, Risk, and Compliance (GRC) practices to forge ahead with ethical practices and good corporate governance, in parallel with systematic risk management and compliance with laws and regulations.

Corporate Risks and Mitigation Plan

Thaioil promotes the systematic monitoring and revision of its risk factors and effectiveness of mitigation plan. The year's risk factor, mitigation plan, and risk management outcomes as indicated in 2019 KRI were presented for the RMC's endorsement and later for the Board's approval. Thaioil and Subsidiaries have divided risks into five key areas and eight distinct risks, with mitigation plans developed to prevent or lessen their impacts so as to achieve the goals. Such risks and mitigation plans are as follows:

Strategic Risks

1. Loss of Competitiveness Risk

Due to the highly competitiveness in refining business especially in production costs which is resulted from more efficient technology, Asia-Pacific's refining capacity expansion, and the implementation of digital transformation to increase process capability. Thaioil needs to withstand and maintain its advantages against other leading refineries in the region by improving the production capability through margin improvement projects. The examples of which include the Hydrocarbon Management Review, process energy efficiency improvement, and increase in sales proportion of petroleum products in Thailand and Southeast Asia. Thaioil also defines measures under the Orchestra Project to curb operating expenses in parallel with the Symphony Project to trim the financial cost. The examples of which include manpower management, work process improvement, implementation of proactive purchasing strategy to establish the procurement bargaining power, operating cost control, reduction of interest expenses, and yield enhancement.

Greater technological advancement has resulted in our commitment to enhancing our potential by transforming Thaioil into a Digital Refinery to increase competitiveness, withstand changes, and accurately and speedily fulfill customers' aspiration with digital tools.

2. Sustainable Business Growth Risk

Thaioil has defined its investment strategies for business growth and pursuit of business opportunities in refining and non-refining through various strategic projects to secure business growth and sustainability. In 2019, after the Extraordinary General Meeting of Shareholders (EGM) No. 1/2018 on August 27, 2018, had approved the CFP investment, Thaioil launched the CFP which has been undergoing engineering design, procurement of machinery and main equipment; assorted preparation; and handing over of land to the contractor to proceed with construction. Since CFP is a massive project pivotal to corporate growth and sustainability, Thaioil especially prioritizes four aspects of project risk management: namely, occupational health and safety including those of the refinery's surrounding communities; project operation period; investment administration; and quality. This year the CFP commanded efficient risk management, carried out with the project contractors and all stakeholders. The 2019 Annual General Meeting of Shareholders (AGM) on April 10, 2019, approved the sales and ownership transfer of the Energy Recovery Unit (ERU), an integral part of the CFP, and the entering into related agreements with Global Power Synergy Plc (GPSC) or its wholly owned subsidiary. GPSC is an expert in the power business; therefore, such agreement with GPSC helped maintain Thaioil's credit rating in the investment grade during project construction.

For investment projects on logistics, infrastructure, and public utilities, Thailoil launched the TOP Crude Oil Tank Project to fabricate crude oil tanks to accommodate legal reserves while rendering refining flexibility. Meanwhile, Jetty Expansion Project is also on process for more work safety, less port congestion, and more flexibility for larger vessels, to transport and distribute new products in the future. Finally, Thailoil has other strategic projects to accommodate its growth, including investment in the Corporate Venture Capital (CVC) and Startup Business.

Commercial Risk

3. Market/Commercial Risk

Crude oil prices and spreads of petroleum products and crude oil, which is the key factor directly impacts for Thailoil's profitability, were still now highly volatile, particularly due to rising crude premiums and falling Gross Refining Margins (GRM). Thailoil, thus, has deployed more aggressive margin hedging by preventing financial losses due to crack spreads and stock losses, as well as inventory to ensure suitable level of stock. The Hedging Steering Committee regularly screens and reviews corporate strategic plans and defines target price for margin hedging under the hedging framework, approved by the Risk Management Committee (RMC) and the Board to minimize such risks.

In addition, Thailoil has brainstormed ideas for plans to increase marginal profits as well as to control operating expenses, to cope with price volatility and maintain the Gross Integrated Margin (GIM).

Financial Risk

4. Financial Risk

Fluctuation of foreign exchange affects Thailoil's business performance since the payment for Thailoil's production costs (crude oil or other raw materials) is in US dollars. To reduce this risk exposure, Thailoil re-arranges Thailoil and Subsidiaries' debt structure and revenue structure in US dollars to ensure their balance (Natural Hedge) and engages in forward contracts for transactions in foreign currencies for loan withdrawals and loan repayment in line with the exposure, as previous done last year.

Thailoil has issued debentures of USD 565 million under the Global Medium-Term Note (GMTN) Program via Thailoil Treasury Center Co., Ltd. (TTC), as an option for securing long-term loans, equipping Thailoil with the readiness and efficiency of capital management, and leveraging the public sector's promotional measures. The establishment of TTC has raised our caliber for international financial transactions, currency risk management, and access to Thailoil and Subsidiaries' best capital sources. This has produced benefits in financial management efficiency and tax privileges granted by the government.

Operations Risk

5. Business Disruption Risk

The risks of severe incidents affecting business or causing business interruption could result from external factors, which include natural catastrophes, security threats, and IT threats, as well as internal factors, which cover unplanned shutdown due to equipment breakdown, and mishaps that could devastate the

environment and communities, including oil spills and major mishaps. All these affect business operation, corporate reputation, communities, society, and the environment. Therefore, Thailoil has defined measures to prevent and mitigate impacts, with the addition of measures on security, safety, occupational health, and the work environment for employees and relevant parties, and the collaboration with all sectors-neighboring communities and local governments. The intention is to monitor the operation and incident prevention, and to establish cooperation on equipment and resources to ease possible impacts. Also, Thailoil constantly stages emergency and BCP drills, reviews and improves its emergency plans, and prepares BCM under ISO 22301:2012. In addition, the Company develops communication guidelines and ensures mutual understanding jointly with related sectors, by regularly organizing meetings and workshops, and employing diverse communication channels to boost confidence in its operation. Thailoil emphasizes that the process safety management is to cover all work processes and be robust to enable a safe and continued business operation.

As far as security threats are concerned, Thailoil extends cooperation with government agencies, police units, military, and local authorities on tracking intelligence and security situations both inside and outside its areas. Thailoil also joins meetings with PTT Group to map out joint security operation at the policy level and the local-site level, and to monitor and develop additional measures to existing security risk management plans. The goal is to ensure continuous business operation while protecting lives and properties of the refinery and neighboring communities.

As for IT system threats, Thailoil has intensified safety measures for IT system to ward off external threats, this includes compliance with the information security standard (ISO 27001), continual system monitoring and audit, and communication of measures and guidelines among relevant parties. These safety measure are regularly tested by third-party experts to identify deficiencies and pursue additional protective guidelines. Moreover, the assessment of the security maturity levels under the Gartner Standard as well as the hiring of a third-party expert to evaluate information risks through vulnerability assessment, and the BCP drills of IT disaster recovery plan, were conducted to ensure for smooth business operation and satisfaction of customers and stakeholders without affecting communities, society, and the environment.

6. Regulation/Legislative Change and Compliance Risk

Changes in public policies focusing on economic development, hand in hand with the development of society, communities, and the environment, do affect current businesses, business expansion, and investment in new projects under Thailoil and Subsidiaries' strategic plans. Thailoil has therefore appointed the Compliance Working Team to ensure our compliance with binding laws, regulations, announcements, rules, and the public sector's directives that bind businesses. The Compliance Working Team is to systematically monitor changes in public policy and emerging legislations including the refining-industry-related laws, new accounting standards and tax laws, and rules enforced by Security and Exchange Commission (SEC) and Stock Exchange of Thailand (SET) to promptly cope with such changes. The Company also cultivates of awareness of compliance among

employees and operators and encourage them to conduct the self-assessment designed to verify the efficiency and effectiveness of compatibility between its business operation and related public policies, rules, legislation, laws, and regulations.

In addition, Thailoil also established a strategic implementation by integrating corporate management with integrity, corporate management ethics and proactive risk management, as well as increasing efficiency for business.

7. Communities and Stakeholders Risk

Thailoil prioritizes business conduct together with community development for a better quality of life through its Corporate Social Responsibility (CSR) projects for communities surrounding the refinery and remote ones. These projects cover such various aspects as education, environment, energy and natural resources conservation to strive for admiration, acceptance, and trust from communities and society. Key projects include the handover of the “Thailoil Building”, a center of accident and emergency medical treatment at Laem Chabang Hospital, the Solar Power for Life (solar farms) for the Border Patrol Police Learning Center in Nopphitam District, Nakhon Si Thammarat; the installation of 40-kWh solar power for Thanyarak Mae Hong Son Hospital in Mae Hong Son; the installation of 53-kWh solar power for Koh Sichang Hospital, Chonburi, and a campaign project for substituting cloth bags for plastic ones. Moreover, Thailoil provides opportunities for stakeholders to take part in community administration through the “3 Synchronizations, 5 Participations” Strategy involving Thailoil, communities, and local entities to jointly

conceptualize, execute, solve problems, learn, and develop so that all sectors would together operate for the public interest with the same goals. Thailoil also follows the process of handling environment impact complaints, in case its operation affects community lifestyles. It established a CFP Support Center to particularly field community complaints concerning the CFP, thus assuring that it commands management measures to ease environmental impacts affecting communities. Thailoil is always committed to operating its businesses with equitable treatment of all its stakeholders to secure sustainable mutual benefit.

Corporate Risk

8. Human Capital Risk

To sustain the CFP and the New S-Curve business, Thailoil restructured its organization and staff number while modifying its recruitment strategies and personnel development to keep pace with corporate needs. Assorted actions are taken to diminish risks, including proactive recruitment through accessing HR sources in an integrated and sustainable way; HR development planning to fulfill Thailoil's future demand by designing essential knowledge and enhancing such among related personnel; technological application in support of information communication and corporate relations, which upgrades communication efficiency and answers the needs of all generations; and modification of personnel administration for greater flexibility and agility to fulfill Thailoil's needs. Additionally, Thailoil advocates compliance with human rights principles in the workplace through risk assessment and monitoring of human rights in the workplace.

Emerging Risk

Changes in political, economic, social, environmental, legal, and technological factors tend to bring out emerging risks, namely:

1. Risk from Rules and Regulations Changes due to Climate Change

Climate change is becoming increasingly critical. This is evident in the 23rd Conference of Parties under the United Nations Framework Convention on Climate Change, held on November 6-17, 2017, to define new regulations, rules, and work scopes under the agreement on the reduction of greenhouse gas emission, to which Thailand agreed on cutting 20-25% by 2030, from the base year (2015). Thailand was committed to tracking, reviewing, and submitting its participation goals for solving global warming every five years. On April 6, 2018, the Office of the Prime Minister issued an announcement on the National Reform Plan, requiring related public agencies to improve laws on climate change and enforce them within three years. In five years, they must designate suitable economic incentives for the private sector's reduction of greenhouse gas emissions. Additionally, promotional measures are designed to encourage the public to alter their everyday behavior, thus become apart of the solution; for instance, the development and promotion of mass transportation as well as the reduction of plastic bag usage. Changes in public policies, laws, and regulations concerning climate change are regarded as a business transition risk resulting from the lack of clarity in mechanism and enforcement.

Mitigation: To handle this risk, Thailoil has defined plans for current and future businesses via market re-segmentation. Direct and indirect reduction of

greenhouse gas emission (scope 1 and scope 2) is to be achieved through higher energy efficiency improvement in production processes and investment in a new crude distillation unit under CFP with modern and highly efficient technologies converting fuel oil into jet fuel and diesel, while elevating the potential for heavy crudes in refining processes. At the same time, the plan is to decommission refining units aged over 50 years. This results in the reduction of greenhouse gas emission, both in Business as Usual (BAU) operations and market re-segmentation, emphasizing more on the aviation and transportation businesses, with the reduction of the gasoline output and the increase of diesel output in line with future demand. In addition, assorted goals have been set; for instance, planning for long-term reduction of greenhouse gas emission goals based on BAU, leading to annual and long-term energy reduction goals based on Solomon's Energy Intensity Index (EII). Thailoil also monitors and takes part in planning for the reduction of greenhouse gas emission collaborating with PTT Group. The Company develops the greenhouse gas life cycle inventory, in cooperation with the Petroleum Institute of Thailand, as a database for participating in the Carbon Footprint Project for products. Thailoil also investigated guidelines and methods of a project named Thailand Voluntary Emission Reduction Program (T-VER) to be prepared for changes in laws on climate change. The Company assessed and pursued suitable guidelines for carbon pricing and carbon credit certification to enter into a low-carbon society in the future. This led to the plan modification, and then modify plans to achieve the reduction of greenhouse gas emission goals. This year a

239-MW combined-cycle power plant operated by TOP SPP Co., Ltd., achieved T-VER certification for energy efficiency improvement by using clean fuels and highly efficient technology of international standards, resulting in the greenhouse gas reduction while garnering carbon credit of more than 300,000 tons of carbon dioxide equivalent per year, the period for carbon credit calculating is seven years, from April 1, 2018 to March 31, 2025, as stated in project terms. Finally, Thailoil has restructured portfolio to increase its non-refining investment in order to reduce the greenhouse gas emission in the next phase.

2. Risks from Rapid Technological Change in the Consumption of Alternative Energy

Technological changes in the consumption of alternative energy is likely to be swift, directly affecting the energy industry. At present, the development and improvement of technology for alternative-energy production have been accelerated to replace oil, including cars powered by electricity and hydrogen. In 2018, some European car manufacturers set treats to cut down or suspend manufacturing of internal-combustion automobiles. The public sector has also issued regulations promoting alternative energy consumption in place of oil. Thailand's public sector issued more regulations to more concretely promote Electric Vehicles (EVs) through Thailand Integrated Energy Blueprint (TIEB 2015) under the Energy Efficiency Plan (EEP 2015). This includes more EV charger stations, formulation of an infrastructural plan for EVs, covering service stations and electricity storage equipment. Investors will benefit from juristic person income tax exemptions. Currently, the public sector

provides support to private-sector construction of prototype plants for lithium-ion and lithium-sulphur batteries (capacity of 500 batteries per day), be tested on assorted vehicles (land and marine). At the same time, certain public transport vehicles are piloting electrical systems. Should consumers alter their behavior and swiftly adopt EVs, the petroleum industry might not be able to adjust in time, affecting the revenue as well as business growth in the long term.

Mitigation: Thailoil has carried out the CFP, due for completion by 2023, to improve its refining efficiency by focusing on producing more diesel and jet fuels. Additionally, it has developed a portfolio structure to increase its non-refining investment over the long term. The goal is to generate 50% income from such businesses while pursuing new investment opportunities, including specialty products. Thailoil addresses the trend of future technological development by leveraging New S-Curve strategies, including Startup Business investment through venture capital funds, to enhance the caliber for manufacturing technology, green and human technology, and hydrocarbon disruption technology. At present, Thailoil is investing in Corporate Venture Capital (CVC) while seeking additional investment opportunities to maintain the revenue growth of Thailoil and Subsidiaries as stated in its goals.

3. Risks of Urbanization

The Eastern Economic Corridor (EEC) is Thailand's strategic plan with the main goal of investment promotion to elevate domestic industries' competitiveness and realize long-term economic growth. The first phase focuses on the economic elevation in three provinces:

Chonburi, Rayong, and Chachoengsao, leading to the expansion of communities around the refinery, labor migration, and urbanization. This, however, could result in resource rivalry between Thailoil and the surrounding communities and a potential increase in conflicts or complaints, thus affecting our current businesses and business expansion under the strategic plans.

Mitigation: To mitigate the aforementioned impacts and enable Thailoil to sustainably grow alongside the communities while striving for business excellence, Thailoil is committed to turning itself into a leading refinery over the next four years by leveraging world-standard management systems, advanced technology, and professional teams. In 2019, Thailoil launched the Refinery in the City Project with a focus on developing Environmental, Social, and Governance (ESG) aspects with our long-term plan:

1. **Environmental and Community Management:** This relies on a robust environmental management system to breed cost-effective resource management and mitigate environmental impacts resulted from production processes. This would bolster confidence among communities and stakeholders.
2. **QSHE Governance Compliance:** This relies on the heightening and enhancement of operating vigor and development of future essential management systems. Collaboration with PTT Group, the Petroleum Institute of Thailand, the Federation of Thai Industries, and other entities helps bolster stakeholders' confidence.
3. **Community Engagement:** The Partner for Life strategy is leveraged through various projects: namely, public communication models, CSR activities, and activities Create Shared Value (CSV) in accordance with lifestyle of surrounding communities, as well as to encourage Circular Economy and Green Society.



INTERNAL CONTROLS

Thaioil constantly values sound internal control under the scope of the Committee of Sponsoring Organizations of Treadway Commission 2013 (COSO 2013) to achieve all three objectives of internal control: efficient and effective operations, credible financial and other reports, and compliance with laws and regulations. The Board of Directors (the Board), therefore, appointed a function responsible for internal control, dedicated to monitoring and reviewing the internal control system through an adequacy assessment of internal control system each year. The Audit Committee is tasked to review such assessment.

This year, the Board examined the adequacy assessment form of Securities and Exchange Commission (SEC), filled by the executives and subsequently reviewed by the Audit Committee, and concluded that this year Thaioil's internal control system is indeed adequate and suitable for its businesses. The system also accomplishes the objectives of internal control. The main composition of the internal control consists of five highlights as follows:

1. Control Environment

Thaioil commands a sound, adequate, and suitable internal control environment for its business, operating under the principles of corporate governance (CG) and code of conduct, with the following management highlights:

1.1 Established written policies and protocols under the CG principles and code of conduct, which include the definition of a code for directors, executives, and employees together with a code

focusing on integrity and their adherence to these codes. Directors, executives, and all employees are obliged to comply with such policies and requirements. Thaioil also undergoes the annual Corporate Governance Report of Thai Listed Companies (CGR) assessment by Thai Institute of Directors Association (IOD) and Thaioil scored top marks (Excellent) for the 11th consecutive year. Also, for the seventh consecutive year, the Company was a certified Dow Jones Sustainability Indices (DJSI) member of the Oil & Gas Refining & Marketing Industry of the Emerging Markets Group;

- 1.2 Defined a code of conduct governing conflicts of interest and required all employees to annually file their conflicts of interest through an electronic reporting system. Thaioil stressed its code of conduct on giving and accepting gifts, assets, or other benefits so as to remind executives and employees to comply with these principles and guidelines;
- 1.3 Committed to conduct business with fairness, integrity, and transparency following the CG principles. Thaioil defined an anti-corruption policy as one of the CG guidelines. It also promoted employees' awareness of legal compliance through Thaioil and Subsidiaries' compliance policy, and developed the Integrated Corporate External Compliance Process, and the Control Self-Assessment (CSA) Law Assessment form for relevant functions to assess impacts of new legislation;
- 1.4 Clearly separated the responsibilities of the Board and those of the executives to ensure the Board's

independence from the executives. The Board's roles and responsibilities include the review and endorsement of key strategies and policies, the Company's objectives, financial goals, risks, plans, and budgets. The Board also supervises to ensure legal compliance and executives' efficient and effective adherence to designated policies and plans;

- 1.5 Structured the organization focusing on efficient internal control together with internal checks and balances through the segregation of key functions, whose authority, duties, and responsibilities are independent from one another. Each function is supervised by its top executive. Thailoil's organization structure is regularly revisited to keep pace with its strategies and work plans. Moreover, the Company structured the compliance function to oversee compliance with related requirements, regulations, and provisions of the law so as to ensure checks and balances as well as audit of work processes.
- 1.6 Defined the HR Policy to upgrade employees' competency in a systematic and sustainable manner, duly embracing aspects of personnel attraction, development, and retention and engagement. Also in place is a fair process of performance management reflecting the ability to perform against Key Performance Indicators (KPIs). To enhance the executives and employees' awareness of CG, this year Thailoil added functional-level KPIs for compliance as well as accommodating risk preventive measure implementation. Personnel recruitment strategies are also reviewed to keep abreast of business circumstances and prevailing business needs. Finally, the readiness of successors of

executives and section managers is assessed to ensure timely replacement;

- 1.7 Emphasized on developing Thailoil's Governance, Risk, and Compliance (GRC) program to drive Thailoil forward with ethics and governance, while adopting systematic risk management and complying with laws and corporate regulations.

2. Risk Assessment

Thailoil values and institutes corporate-wide risk management. To this end, the Board assigned the Risk Management Committee (RMC), consisting of proficient directors devising corporate risk management policies and overseeing protocols and processes of the risk management in the corporation, department, and personnel levels of Thailoil and Subsidiaries to ease impacts on businesses and to ensure corporate objective achievement. As far as managing risks is concerned, Thailoil appointed the Risk Management Steering Committee (RMSC), consisting of Chief Executive Officer and President, Executive Vice Presidents, and Managing Directors of Subsidiaries, to review, monitor, and audit Thailoil and Subsidiaries' risk management outcomes and business continuity management, to assure that they comply with the corporate risk management policy and that the risk management is efficient and suitable for business conduct and growth.

To this end, Thailoil devised a risk management plan embracing risk assessment, analysis, and review in line with its strategic and business plans under its objectives and goals. The Company reviewed external and internal factors, including domestic political situations, world economy, laws, regulations, government policies, and stakeholders' expectations. It also defined seven risk appetites covering performance and investment;

compliance; safety, occupational health and environment; reputation; fraud and corruption; ICT security; and Clean Fuel Project (CFP). Key Risk Indicators (KRIs) were also identified to help track and report the outcomes of each unit and the corporation as a whole to ensure the goals achievement. Moreover, risk management measures are monitored to reduce business risks. Furthermore, it defined Business Continuity Management (BCM) to encompass all risks, and held drills by simulating incidents potentially affecting business. Finally, key risks and their mitigation plans are regularly reported to Thailoil and Subsidiaries' RMSC, RMC, Audit Committee, and the Board, respectively

To enhance risk management efficiency, Thailoil developed an IT system for risk management purposes by applying the Risk Management Information System (RMIS) to define key risks, risk mitigation, and KRIs, while developing a Performance and Risk Online (PRO) to include KPIs and KRIs on the same database. Additionally, to address volatile oil prices and exchange rates, Thailoil revised and developed risk management measures for margin hedging, inventory hedging, and foreign-exchange risk management; and the internal control measures were also revised to cope with such uncertainties.

Each year process owners survey prevailing parameters affecting internal control by assessing the Internal Control Checklist and planning improvement or enforcing control for its correlation and update. This year, Thailoil initiated a workshop before rolling out such assessment forms to vice president of relevant departments so as to improve their understanding of responses to SEC's adequacy assessment form for internal control and that their responses are in line with current operations.

3. Control Activities

Efficient and effective control activities help Thailoil mitigate risks of missing its objectives and keep them manageable. The key measures are as follows:

- 3.1 Internal control policies, including work protocols, manuals, clear procedures, and Corporate Authorization Procedures (CAP) are designed to define fund limits and approval authority involving budgets, personnel administration, procurement, hiring, contract administration, commerce, finance and treasury, accounting, and asset transfer and amortization.
- 3.2 Internal control measures with due regard for sound control principles, including distinction of duties, approval, review, and document storage, are designed to ensure efficient and effective conducts, credible reports and compliance with related laws and regulations. This year, Thailoil developed CSAs of key processes for its Subsidiaries, and in accordance with their context in order to monitor the adequacy and suitability of their internal control.
- 3.3 Control measures for regularly monitoring transactions involving the Board and the executives by defining guidelines for them to report their intention to purchase or sell both their Thailoil's share and that of related parties, to the Company Secretary at least one business day in advance before the actual transaction, and report Thailoil's securities changes to the SEC within three business days after transaction date.
- 3.4 Preventive and monitoring control activities, both manual and automated ones that are inherent in work processes, are developed and aimed for all executives

to supervise and inspect their units' respective work processes to ensure efficiency and propriety under work regulations, with suitable, concise, and auditable internal controls. Also, the Continuous Control and Monitoring System (CCMS) is applied to prevent and monitor automated controls.

3.5 Development of technology-related control activities are in place. Thailoil defined the IT policies and the Cybersecurity Framework to be in line with the framework of the National Institute of Standards Technology (NIST) of the US, which is widely adopted as an international standard. The Company also issued a work manual and a policy on the management of information storage in digital and paper format under the ISO 27001 standard. Moreover, Thailoil Group Digital Steering Committee was appointed to define direction, policy, as well as to efficiently drive digital administration and strategic management. The Digital Transformation Project was also launched to add efficiency to current operation by applying digitization to aid operation and accommodate future growth. Finally, recognizing the dangers of cyberthreats, Thailoil staged a cyberthreat drill, in parallel with a Business Continuity Planning (BCP) drill, to ensure the ability to ward off and cope with undesirable incidents, and thus safeguard itself from such impacts.

3.6 Designation of a TOP Group Affiliates Management (TAM) policy and TOP Way of Conduct to steer Thailoil and Subsidiaries' management in the same direction through jointly considering and making decision on critical matters and regularly monitoring subsidiaries' and associates' businesses. To this end, Thailoil executives also served as managing directors or managers, and were appointed as directors in

such companies. As a result, Thailoil has regularly participated in policy-making, acknowledging data, and periodically monitoring performance outcomes against KPIs.

4. Information and Communication

Thailoil values information and communication systems that systematically support business operation, execution, management, and financial reports in order to accommodate decisions made by the Board and the executives. To support efficient and effective internal control, Thailoil defined proper Information and Communication Technology (ICT) policies and protocols. Thailoil also developed the Important Document Management System to compile essential documents in one place, while issuing control measures on the exploitation of such documents, which must be approved by document custodians.

Recognizing the importance of internal communication for prompt, complete, and accurate information for employees, Thailoil has developed an internal communication manual for such communication's steering, and defined efficient guidelines for managing contents and practical communication channels. To this end, the Company has established the intranet, e-mails, e-Newspapers, and internal publication (Akanee), as well as communication practices between the executives and staff to ensure goal achievement. The vital information is properly communicated to the Board for consideration by sending meeting documents which are to reach the Board at least seven days prior to each actual meeting.

As for external communication, Thailoil relies on public relations channels and advertisement through the

printed media, radio, advertisement films, corporate website, and social media such as Facebook. This is to assure that stakeholders can access key information more conveniently and speedily. Thailoil also values crisis communication by launching a crisis communication center to quickly and suitably distribute accurate information.

Finally, Thailoil has defined complaint-filing and whistleblowing measures in writing, embracing complaint-handling, fact-finding, conclusion, clear complaint-filing channels, and whistleblower and related parties' protection mechanism. This enables employees and third parties to report or provide information concerning unlawful acts, fraud, or pursuit of improper benefit exploitation.

5. Monitoring Activities

Thailoil deems all executives with duties and responsibilities to oversee and inspect internal work systems to ensure efficiency and conformance to policies, requirements, and work regulations under a concise internal control system. Thailoil equally values the management of Security, Safety, Occupational Health and Environment (SSHE) by requiring executives to undergo annual self-assessments to review its operation and assure that it aligns with requirements to safeguard and

minimize losses regarding safety and occupational health of employees, contractors, and operational processes.

To provide assurance for the stakeholders that Thailoil operates under an efficient and effective management system, with preparation of financial and other reports in an accurate, transparent, credible, and timely manner, not to mention strict compliance with laws and regulations, Corporate Risk Management Section (CRM) is tasked with the monitoring of internal control outcomes each year. This means at the corporate level, the executives conducts the assessment via SEC's assessment forms of internal control adequacy; while at the process level, the process owners assess via CSA. Should there be changes in tasks or work processes during the year, the CRM can duly update work procedures and control measures. In addition, it applied CCMS to monitor internal control and identify irregular transactions in the system, while the Corporate Internal Audit formulates annual audit plans based on key risks, change or increase in work processes, and requests from executives and the Audit Committee (if any). This year, the Corporate Internal Audit Department examined the internal control system under the annual audit plan to verify the adequacy and suitability of each activity of such system.

CORPORATE GOVERNANCE REPORT

Thai Oil Public Company Limited is committed to conduct business in compliance with good corporate governance principles and business ethics with utmost transparency and scrutiny. These are the essential cornerstone to generate trust among the investors and stakeholders, enhance business competitiveness, promote sustainable growth, increase the ability to adjust to any emerging changes, and encourage Thailoil to achieve its mission, “to enrich stakeholders’ well-being and deliver sustainable returns built upon innovation, technology and resilient portfolio, with top-class management and accountable corporate governance.”

The Board of Directors (the Board) always prioritized business practices based on good corporate governance policy and principles, by assigning the Corporate Governance Committee to regularly monitor and promote business operations in compliance with national and international corporate governance policy and business ethics, in order to maintain its governance standards in accordance with the Securities and Exchange Commission (SEC), the Stock Exchange of Thailand (SET), and the 2017 Corporate Governance Code (CG Code 2017), with the following details:

1. Corporate Governance Policy

Thailoil’s Board established the Corporate Governance (CG) policy in written form in 2001. The policy clearly defines roles and responsibilities of Thailoil and Subsidiaries’ Directors, executives, and employees, who are responsible for acknowledging and adhering to this policy. The Company regularly reviewed the relevant CG policy, principles, and practices. In 2019,

Thailoil reviewed good corporate governance policies, principles, and guidelines based on the criteria of the SEC and SET, as well as corporate governance assessment have been developed from various institutions over the years. Thailoil found no significant change, thereby making Thailoil’s CG policy and principles still consistent and appropriate.

However, in 2019, Thailoil reviewed and update the following guidelines:

- >> Amendment of Criteria of the Number of Directorship in Listed Companies (details on page 153)
- >> Guidelines of the Board and the Executives to Report the Intention to Purchase or Sell the Company’s Share (details on page 151)

Moreover, Thailoil has clearly defined its **CG principles (REACT+E)** to make it easier to communicate to the Board, executives, and employees to comply with such principles. Thailoil’s CG principles are as follows:

1. Responsibility for performing duties with due competence and adequate efficiency
2. Equitable treatment of all stakeholders
3. Accountability for one’s own decision-making and acts, as well as those of others under one auspices
4. Creation of long-term value
5. Transparency in conducting business, openness to scrutiny, and transparent disclosure of corporate information to related parties
6. Ethically under taking business operation and conformance to the Code of Conduct.

2. Corporate Governance and Code of Conduct (CG and CoC)

2.1 Code of Conduct (CoC)

Thaioil established its CoC, based on good corporate governance principles and practices, emphasizing on the equality, fair, and scrutiny. The CoC is designed to frame business conduct for the Board, executives, and employees to complying and adhering to. Such guidelines included code of conduct relating to stakeholders, purchasing, compliance with the law and regulations, the respect for cultures and customs, etc. The Board and executives are required to be ethical leaders and role models in performing duties with integrity, honesty, fairness, transparency and scrutiny to promote sustainable CG culture within the organization.

2.2 Communication and Promotion

Throughout 2019, Thaioil organized various activities to cultivate knowledge, understandings, and communicate the importance of CG and CoC Policies, in order to provide Thaioil and Subsidiaries' employees and stakeholders to understand and able to apply CG and CoC principles as follows:

Corporate Governance and Code of Conduct Manual

With approval of the Board, Thaioil published its first version of **Corporate Governance and Code of Conduct Manual (CG and CoC Manual)** in 2004. The current version is the fourth revision, consisting of CG principles, business ethics, anti-corruption policy, and other relevant practical guidelines. The manual are distributed to the Board, executives, and employees of Thaioil and Subsidiaries. Upon receiving, they are required to **study the content and sign the "Acknowledgment Form"**, then returned to the Governance and Sustainability Department for record-keeping. Additionally, Thaioil disclosed its CG and CoC Manual in Thaioil's website for all stakeholders and the interested public to easily access such information.

New Employees' Orientation, Training, Activities, and Communication

Thaioil cultivates knowledge and understandings on the key essences of good corporate governance principles, business ethics, and anti-corruption practices to all new employees on their first day at Thaioil. Moreover, Thaioil regularly raised governance awareness through activities and various forms of communication to foster compliance with such principles throughout 2019, including Integrity the Series - a 6-episode short story aimed to promote honesty, fairness, compliance with the law, professionalism, commitment, and honor others - as tool to create positive corporate culture. Additionally, Thaioil in conjunction with affiliates under PTT Group, organized PTT Group CG Day 2019, under the theme "Digitalization: Challenge for the Governance," in which business partners and customers of each company were invited to participate in this event. Thaioil also set up corporate governance and anti-corruption exhibitions to promote understandings in Suppliers Relationship Management Seminar 2019 (SRM Seminar 2019), along with communication of relevant practices through AKANEE Journal (an internal publication) and corporate e-newspapers to all employees throughout the year.

2.3 Good Corporate Governance and Code of Conduct Guidelines and Enforcement

Thaioil defines the duties and responsibilities for the Directors, executives, and all employees to acknowledge and comply with the policies and terms indicated in **Thaioil's CG and CoC Manual**. They are also subjected to comply with code of conduct in regards to whistle-blowing measures and mechanisms as well as internal audit processes. If the Directors, executives, or employees violate the corporate governance principles, they will face strict disciplinary punishment. If it is suspected that they have violated any law, regulations, rules, and requirements

laid down by the government sector, they will be handed to public officials for prosecution.

If employees find it difficult to decide on any given circumstances in regard to Thaioil's CoC or is not explicitly stated in Thaioil's CoC, they should ask themselves the following questions:

- 1) Is this action against the law?
- 2) Is this action against Thaioil's policy, its CoC, or its image?
- 3) Is this action going to severely affect Thaioil and Subsidiaries' stakeholders?
- 4) Is this action socially acceptable and disclosable?

Compliance with the Law, Rules, and Regulations

Thaioil regularly audits and monitors performance of each operational unit to ensure compliance to relevant business law, rules, and regulations, by appointing the Compliance Working Team, with the roles of a regulatory body to steer and assure that all units within Thaioil systematically comply with the law, rules, regulations, and announcements of government agencies. The team also acts as Compliance Assurance, by commanding appropriate monitoring process, to strengthen confidence among the Board, executives, and all stakeholders in accordance to Thaioil's CG and CoC principles. Thaioil also officially launched Thaioil and Subsidiaries' Compliance Policy as guidelines for all employees to abide by during their operations.

In order to command a sound Governance, Risk, and Compliance (GRC) system, Thaioil established GRC Committee to develop and improve corporate governance, risk management, internal control, and compliance with internal and external law and regulations; thus to ensure the effectiveness of GRC program.

2.4 Whistle-Blowing Measures and Whistle-Blower Protection Mechanism

Thaioil established **whistle-blowing measures and whistle-blower protection mechanism** to receive complaints from stakeholders affected or risk of being affected by Thaioil's operations. They can also use it to report the performance of the Directors, executives, and employees in regards to unlawful or unethical conduct, as well as actions that may imply fraud. Thaioil published the whistle-blowing measures and whistle-blower protection mechanism in its CG and CoC Manual and the Company's website.

Those who experience violation of their rights or are affected by Thaioil and Subsidiaries' operations, stakeholders, employees, and relevant persons that come across or are aware of clues, are to filing a complaint or whistle-blowing report through the available channels below. Complainant must explicitly spell out "confidential" when filing matters through these channels.



**Chairman of the Board or
Chairman of the Corporate Governance Committee or
Chairman of the Audit Committee or
Chief Executive Officer and President or
Company Secretary**

Thai Oil Public Company Limited
555/1 Energy Complex Building A, 11th Floor
Viphavadi Rangsit Road, Chatuchak, Chatuchak,
Bangkok 10900



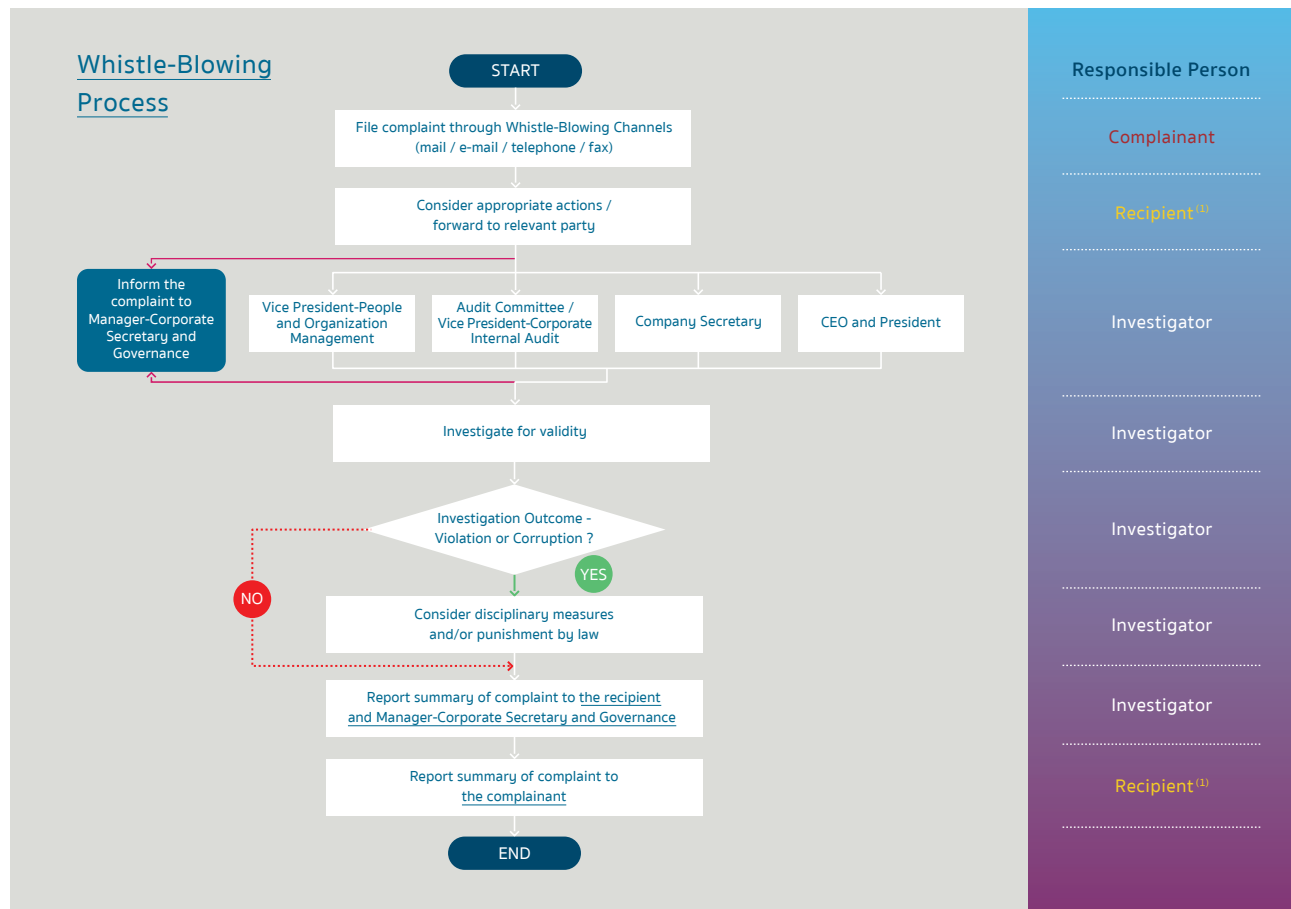
cgcoordinate@thaioilgroup.com
(Manager-Corporate Secretary and Governance
will acknowledge receipt of the matter and duly
forward it to responsible parties)



+66(0) -2797-2900, +66(0) -2797-2999,
+66(0) -2299-0000 ext. 7318-7319



+66(0) -2797-2973



Remark : ⁽¹⁾ Chairman of the Board, Chairman of the Corporate Governance Committee, Chairman of the Audit Committee, Chief Executive Officer and President, Company Secretary

Complainants, Whistle-Blowers, and Relevant Parties' Protection

Complainants or whistle-blowers are to be suitably and fairly protected by Thailoil, which implies no change in job titles, job nature, workplaces, job relief, threats, harassment, dismissal, or any unfair acts. Thailoil will keep their complaints confidential and not disclose them to unrelated parties, except when required by the law.

In 2019, Thailoil received three complaints from this whistle-blowing channel. Two of which concerned impacts

from the Company's operations, and the other concerned the Company's internal process. The complaints regarding impact of the Company's operations have been revised, put in place additional preventive measures, and notified the complainants on the outcome. In regards to complaint on the Company's internal process, Thailoil has appointed an investigation committee to investigate the facts. It was found that none of the complaints were concerned illegal act, with no fine or monetary liability, and no corruption case. Thailoil will take observations to improve internal control system and process to prevent further reoccurrence.

3. Compliance with the Good Corporate Governance Principles

3.1 Rights of Shareholders

Shareholders have the right to ownership, by appointing the Board of Directors to act on their behalf. Thailoil values the protection of shareholders' rights, thus provides opportunities for shareholders to exercise their fundamental rights as abide by law. In addition to fundamental rights, Thailoil promotes the exercise of shareholders' rights extensively by allowing them to propose agenda items for the AGM and to propose and nominate Director Candidates in advance of the AGM.

Annual General Meeting of Shareholders (AGM) 2019

Thailoil held its 2019 AGM on Wednesday, April 10, 2019 from 09.30 hours at Bangkok Convention Center, 5th Floor, Central Ladprao – a location for transportation convenience whether by car, underground subway (MRT), and public transport. The meeting was organized in accordance with the AGM Checklist, prepared by the Thai Investors Association (TIA), the Thai Listed Companies Association (TLCA), and Thailand Securities and Exchange Commission (SEC). In 2019, Thailoil received a full score of 100 points on AGM Checklist, reflecting its continual commitment in organizing its AGMs with highest CG standard. Furthermore, Thailoil provided AGM Quality Assessment for the shareholders during its AGM to acquire feedbacks and recommendations to efficiently improve the future AGMs.

Before the AGM

>> **Provided an opportunity for shareholders to propose meeting agenda and nominate Director Candidates**, in which the criteria and procedures are publicized on SET's electronic system and Thailoil's website, from September 28 to December 31, 2018. The proposed meeting agenda and the list of nominated Director

Candidates will be considered in accordance to criteria specified by Thailoil. The Company also provided an opportunity for the shareholders to submit questions prior to the AGM, as specified in the AGM invitation notice. In the 2019 AGM, none of the shareholders has proposed meeting agenda or nominate Director Candidate to be elected as Thailoil's Director. All of these information has been disclosed in the AGM invitation notice.

>> The Board passed the resolution to determine the date of Thailoil's 2019 AGM and the Company immediately submitted news releases to SET for shareholders' acknowledgement on February 15, 2019.

>> **Published the 2019 AGM invitation notice**, both in Thai and English language, through Thailoil's website for **more than 30 days prior to the date of AGM** (March 6, 2019). Thailoil also **distributed the invitation notice** along with the 2018 Annual Report and the 2018 Sustainability Report, in QR Code format, **21 days before the meeting** (March 18, 2019). Moreover, the Company announce the date of AGM in both Thai and English newspapers for more than three consecutive days and 22 days prior to the AGM; thus allowed shareholders adequate time to prepare themselves for the meeting.

For **institutional investors**, Thailoil facilitated the AGM registration process by contacting institutional investors to coordinate in the preparation of proxy forms prior to the date of AGM.

>> **If shareholders cannot attend the AGM in person, they may vote their shares by proxy by allowing someone else to cast votes on their behalf. The proxy forms are attached to the invitation notice.** Moreover, Thailoil attached all seven Independent Directors' CV along with work experiences and their conflict of interest

report in the invitation notice, to allow shareholders to consider a proxy for Independent Director to attend the AGM and cast votes for them.

On the Date of the AGM

- >> Thailoil assured that the AGM venue has adequate space to accommodate shareholders and has transportation convenience. To ensure the safety of all shareholders, a contingency plan is in place for emergencies. Additionally, surrounding the AGM venue were exhibitions displaying Thailoil's key information, Investor Relations (IR) Corner to facilitate the shareholders, and sufficient amount of snacks and beverages to accommodate shareholders upon arrival.
- >> Thailoil implemented the barcode system in the shareholders' registration process and the counting of votes for accuracy and convenience. Thailoil made the registration process available two hours prior to the meeting. Furthermore, Thailoil allowed shareholders to registered and attend the AGM after the meeting commenced.
- >> Thailoil values the shareholders' voting right of **one share equals one vote**. For greater convenience of voting and ballot counting, Thailoil prepared separate ballots for each agenda item. Specifically, on the agenda of new Directors' appointment, Thailoil provided separate ballot for each of the Director. To increase transparency for voting process, **Thailoil allowed shareholders, as volunteers, to witness the ballot counting process, along with having independent legal counselors to audit such process.**
- >> The Board Chairman, Chairman of Board-Committees, all 14 members of the Board, including executives, auditors, and independent legal counselors attended the AGM. At the meeting commencement, the Board Chairman, acts as Chairman of the meeting, will clarify

rules and criteria relating to the meeting, for instance, voting procedures, etc.

- >> **The AGM was organized in the orders of the agenda listed in the invitation notice** without changing any sequence. **Thailoil refrained from considering agenda that are not listed in the invitation notice** and does not have a policy to add agenda items to the AGM without prior notice to the shareholders.
- >> The Chairman of the meeting **encouraged all shareholders to equally exercise their rights by asking questions and expressing opinions** prior to voting and the announcement of resolution of each agenda. **Thailoil recorded questions and comments in the minutes of the AGM for shareholder's verification.**
- >> To facilitate foreign shareholders, Thailoil provided staff to translate questions, responses, and suggestions to ensure the unified understandings of all attendees.

After the AGM

- >> Thailoil disclosed the resolution of its AGM along with voting results on the same day after the meeting through SET's electronic system and Thailoil's website. The Company also prepared minutes of the AGM, in both Thai and English, comprising of the name of Directors, executives, and related persons attended the meeting, statement of claims to important agenda, questions and answers, meeting resolutions, and voting results, through SET's electronic system within 14 days after the AGM (April 24, 2019) and published in Thailoil's website.

3.2 Equitable Treatment of Shareholders

All shareholders are entitled to identical treatment and protection of fundamental rights. By recognizing such importance, Thailoil provides channels to ensure that the shareholders are treated equally and fairly as follows:

- >> A direct channel for all shareholders, including major shareholders, minor shareholders, institutional investors and analysts to request information, feedback, make suggestions through email at ir@thaioilgroup.com or by direct telephone at +66(0) 2797-2961. The Investor Relations Section is in charge of these channel and is responsible for providing information.
- >> Thaioil organized various activities to foster good relationship among the shareholders. These activities included a site-visit to Vidyasirimedhi Institute of Science and Technology (VISTEC), Wangchan District, Rayong Province. Thaioil also participated in events for shareholders organized by SET, such as SET in the City 2019 and Opportunity Day, which are normally organized after the announcement of the financial statements each quarter.

3.3 Roles toward the Stakeholders

Thaioil is committed to conduct its business with fairness and utmost regards to the impact and treat to all stakeholders, based on equality, to create sustainable benefits. Thaioil established policies and ethical guidelines for each group of stakeholders in its CG and CoC Manual, which can be downloaded from Thaioil's website.

In addition to this Annual Report, Thaioil publicized its Integrated Report in accordance with the International Integrated Reporting Council (IIRC) Report, together with the sustainability highlights of the Global Reporting Initiative (GRI) Framework and additional indicators from the GRI Oil and Gas Sector Disclosure. This is to demonstrate and assure that Thaioil is committed toward sustainable development, encompassing business strategy, management approach, and information on economic, social, and environment factors are evidently and transparently stated.

Policy and Practices for the Stakeholders

Throughout the year 2019, Thaioil conducted business in accordance with policies and plans for each group of stakeholders as follows:

Shareholders, Investors, and Analysts

In addition to the information in the "Rights of Shareholders" and "Equitable Treatment of Shareholders" sections, Thaioil organized various activities for the shareholders, investors and analysts, including the Strategic Direction Meeting, the Analyst Meeting, meet investors at SET's Opportunity Day each quarter. Thaioil regularly communicate important information through SET's electronic system, Thaioil Website, as well as the "TOP IR Mobile Application" to timely and conveniently provide all Stakeholders' access to information.

Customers

Thaioil is committed to strengthening customer satisfaction and confidence by delivering quality products based on their requirements along with honoring agreements and conditions made with customers on a fair, complete, prompt and factual basis, as well as foster a sustainable relationship between the customers and Thaioil. Thaioil provided "Customers Relations Management Section" to supervise and communicate directly to the customers. If the customers found that the Company is being unfair or become unsatisfied with its services, customers can file complaint directly through email at crm@thaioilgroup.com. In 2019, Thaioil conducted a wide range of activities to generate customers' satisfaction and confidence, for instance, applying Blockchain Technology in Letter of Guarantee; organized refinery site visit for customers; and regularly visit customers to build good relationship and received further suggestions for improvement. Each year, Thaioil launched customer satisfaction survey and organized workshops with relevant agencies to

brainstorm work process improvement, enhance customers' satisfaction, and create greater relationship with the customers through sports as well as CSR events.

Business Partners

Thaioil strictly observed the Procurement and Service policy and guidelines, by publishing Thaioil and Subsidiaries' Procurement Policy as tool to drive all Subsidiaries' businesses in the same strategic direction. This is also to ensure equal and fair adherence to the partners and that all Thaioil and Subsidiaries' procurement and selection process comply with Thaioil's regulations and criteria. The selection methods and outcomes were systematically recorded. Thaioil also published its Supplier Code of Conduct and the Code of Conduct on Purchasing, to ensure that all operations were carried out professionally, transparently, and fairly.

Moreover, Thaioil launched strategic partners' survey to obtain general overview of Thaioil and Subsidiaries' practices to business partners, thus to improve future collaborations. Thaioil set up "Suppliers Relationship Management Section" to directly supervise and communication with the business partners. This year, Thaioil organized many events to strengthen relationships with its partners, for instance, the 3rd ESG Plus Verification Project to ensure conformance to environmental, social, and governance aspects and the 2019 Suppliers Relationship Management Seminar (SRM Seminar 2019).

Employees

Thaioil strictly committed to actively administering human resources practice, in accordance with labor law and regulations, by fostering a good corporate culture and work environment, together with fair returns, to ensure and encourage employees to continue working with Thaioil and Subsidiaries' Companies. Thaioil also strictly complied

with the Universal Declaration of Human Rights on the basis of fairness and equality. To ensure corporate-wide coverage, Thaioil executed the following programs:

>> Thaioil strictly complied with the Universal Declaration of Human Rights at national and international levels, labor law, and regulations. Thaioil refrained from practicing unlawful labor; thus treated all employees equally with respect to human dignity and the rights of liberty, and equality, in which Thaioil established "**Human Rights in Workplace Policy**" to tangibly support the human rights principles. Furthermore, Thaioil established "**Human Rights Policy for Suppliers**" to enhance its business operations, covering society, community, and the supply chain across Thaioil and Subsidiaries.

>> **Thaioil has a fair remuneration and welfare policy** which is comparable to peers, appropriate with knowledge, capacity, responsibility, and related to the performance of each employee. That is why Thaioil annually reviewed the remuneration structure to assure that its remuneration remained in the industry's top quartile. To make sure that **employees' remuneration is aligned with short-term and long-term corporate performance**, Thaioil considered salary adjustment for the executives and employees once a year by utilizing the four dimensions of Balance Scorecard Concept, namely: sustainability, stakeholders, internal process, and learning and development to develop Corporate Key Performance Indicator (Corporate KPI), which is cascaded down to each employee's KPI (Individual KPI). This included current short-term performance and overall performance based on long-term strategies to lay the foundation for future business growth. Thanks to this evaluation, the remuneration of executives and employees is in line with both short-term and long-term

corporate performance. Furthermore, Thailoil defined variable bonus payment linked to yearly performance and employee performance (for Section Managers upward) to motivate them to achieve annual corporate goals.

In order to retain and motivate employees to work and drive the organization toward long-term goals, Thailoil established remuneration policies, which include annual-wage increase guidelines. Thailoil also contributes a certain rate to its **employees' provident fund**, based on their service duration with the Company. Moreover, Thailoil also provided medical benefits for employees and their families, housing allowances, accidental insurances, club memberships and leisure services, Thailoil Savings Cooperative, and Thailoil Consumers Cooperative.

>> Thailoil is committed to enhancing the abilities of its employees to support business growth, in which Thailoil promoted employees attendance in the in-house, local, and overseas training. Moreover, Thailoil provided academic scholarships for its employees to pursue Master Degrees abroad and provided educational support for its employees to study English language, in preparation to support further business expansion and in line with its vision and strategies. In 2019, Thailoil and Subsidiaries' employees spent an average of 67.30 training hours per person.

The information on human resources management can be found in the "Human Resources and Organizational Development" section on page 72

Creditors

Thailoil professionally and disciplinary operated its businesses in accordance with the mutual agreements with the creditors. It is our responsibility to issue guarantees

along with financial reports to our creditors with integrity and consistency. In case of failure to comply with terms and conditions, Thailoil will immediately inform the creditors on the solutions and in order to prevent possible damage.

Business Competitors

Thailoil complied with the rules of fair competition and treated business competitors fairly under the Competition Law Framework. Thailoil refrained from dishonesty or improperly seeking confidential information on business competitors. Thailoil refrained from defaming business competitors through slander. Additionally, Thailoil refrained from involving in any activities that may lead to set the limitation or reduction of business competition.

Community, Society, and Environment

Thailoil established policies on **Quality, Security, Safety, Occupational Health, Environment, Energy, and Social Responsibility Management** to bolster quality of lives for the community, the society, and the environment. This considered as factors to ethically and transparently drive Thailoil's businesses. The details of the "Quality, Security, Safety & Occupational Health, and Environment Management" can be found on page 58.

For Corporate Social Responsibility (CSR), Thailoil is determined to reduce risk and negative impact due to its operation. Thailoil also fosters good relationship with neighboring and remote communities and improves their quality of lives. Thailoil, therefore, implemented its social responsibility under four frameworks: education, energy and natural resources, environmental conservation, and quality of life.

(The detail of Thailoil and Subsidiaries' CSR implementation activities was disclosed in the Integrated Report 2019).

Policies and Practices of Non-Infringement of Intellectual Properties and Copyrights

Thaioil established the “**Code of Conduct: Intellectual Properties**”, in which all employees must comply with all laws and regulations in every countries it invested in. In addition to the respect of others’ intellectual property rights, Thaioil and Subsidiaries’ employees must maintain commercial secrets, formulae, product process and sensitive business procedures by ensuring the safest storage and preventing leaks, while refraining from exploiting these for personal gains without the owners’ prior approval or without giving them due compensation. Thaioil also has the “**Code of Conduct: Application of Information and Communication Technology**”, which strictly prohibited the installation and the use of illegal computer software in workplace.

Anti-Corruption

Thaioil is committed to basing its businesses on fairness, integrity, transparency, and responsibility to society and all stakeholders in accordance with Thaioil’s CG and CoC principles and international principles, in order to bolster confidence to all stakeholders and to support sustainable growth. Being aware that corruption is a major obstacle to business achievement and a problem to national economic and social development, Thaioil established an explicit “**Anti-Corruption Policy**” comprising of definitions, roles and responsibilities, implementations, and measures. The Board, executives, and employees are required to acknowledge and comply with this policy. The Anti-Corruption Policy has been annually reviewed to improve its development to keep pace with the changing circumstances. In 2019, Thaioil found that the rules, regulations, and the announcements from the regulatory authorities have no significant change; therefore, Thaioil’s Anti-Corruption Policy remained accurate, consistent, and appropriate.

In addition to this policy, Thaioil defined guidelines relating to anti-corruption matters in its CG and CoC Manual, such as conflicts of interest, giving or acceptance of gifts, assets, or other benefits, etc. The Anti-Corruption Policy and relevant code of conducts are also clearly written in the Manual. Thaioil distributed the Manual to all Directors, executives, and employees. The Manual can be viewed and downloaded from Thaioil’s website.

Thaioil applied a concrete anti-corruption policy and practices as follows:

>> Communication, Knowledge Sharing, and Continual Anti-Corruption Trainings

Internal Communication - Thaioil held employees’ orientation, promote Integrity the Series - a 6-episode short story to promote ethical conducts, internal event to promote anti-corruption practices, and participated in PTT Group CG Day 2019, organized under the theme “Digitalization : Challenge for the Governance.” This year, Thaioil also communicated the No Gift Policy to raise awareness on refraining from accepting gifts or hospitality of any types through internal communication channels, such as e-newsletters, Thaioil’s website, signage, articles in the AKANEE (an internal publication), and corporate e-newspapers to constantly cultivate knowledge and understanding for employees throughout the year.

External Communication - Thaioil published a conforming letter for customers, business partners, financial institutions, and relevant third party for their cooperation to refrain from offering gifts and hospitalities to Thaioil and Subsidiaries’ executives and employees. Thaioil also promoted the No Gift Policy, along with extending invitation to these parties to participate in anti-corruption and business conduct activities such as CAC SME Certification Project, PTT Group CG Day 2019, etc.

- >> **Encouraged employees to join workshops and seminars relating to anti-corruption** to review, adopt, and develop practical guideline for Thailoil and Subsidiaries' anti-corruption programs, including.
 - Corruption Risk & Control: Technical Update (CRC), organized by Thai Private Sector Collective Action against Corruption (CAC)
 - Fraud Risk Management, organized by PTT Plc and lectured by PricewaterhouseCoopers ABAS Ltd.
- >> **Established Corporate Strategic Risk Section to serve risk management for Thailoil and Subsidiaries**, comprising of strategic planning processes, investments and operations in all aspects, and anti-corruption. The Section focused on Thailoil and Subsidiaries' operations, under seven risk appetites, namely: performance and investment; compliance; safety, occupational health, and environment; reputation; fraud and anti-corruption; ICT Security; and the Clean Fuel Project (CFP). Furthermore, Thailoil also defined key risks and use key risk indicators to assess risks and as tools to transmit early warnings, by close monitoring and effective risk management.
- >> **Put in place an internal control system to prevent corruption risks** such as the establishment of Corporate Internal Audit Department with responsibilities to monitor and evaluate other units' operations as well as financial activities. This will assure that Thailoil and Subsidiaries' operations are in compliance with protocols, rules, and regulations. Thailoil also introduced the Procurement Policy to drive Thailoil and Subsidiaries' procurement standards toward the same strategic direction.
- >> Directly under the Audit Committee and independent from Thailoil and Subsidiaries' executives, the Corporate Internal Audit Department is responsible for **monitoring**

and evaluating the implementation of anti-corruption policy of other units' operations covering key issues such as commercial promotions, procurement, financial reports, etc. This Department also reviewed operations to assure that all employees follow protocols, rules, and regulations. After each evaluation, this Department provided recommendations for improvements of greater effectiveness and better internal control system in order to prevent potential fraud and corruption.

To demonstrate Thailoil's commitment in countering corruption, as a listed company, it is our responsibility to foster confidence among shareholders and stakeholders. Not only Thailoil held internal activities, Thailoil also received certification and joined external parties in countering corruption. This year, Thailoil participated in these following activities:

- >> Received the NACC Integrity Awards in the 8th NACC Integrity Awards, organized by the Office of the National Anti-Corruption Commission
- >> **Thailoil became a "Certified Company"** for the Private Sector Collective Action Coalition against Corruption (CAC) in April 4, 2014. **On March 9, 2017, Thailoil received re-certification from the CAC and submitted for CAC re-certification in Q4/2019.** This certification proved its commitment to transparently operate its businesses through continual improvement of its work processes, which promote good image and boost confidence among the stakeholders.
- >> Thailoil's executives and employees joined the "National Anti-Corruption Day 2019", under the concept of "Join Forces...Volunteer to Fight Corruption", organized by the Anti-Corruption Organization of Thailand on September 6, 2019. Thailoil also participated in the "International Anti-Corruption Day" under the concept of "Zero Tolerance for Corruption" organized by the

Government, the Office of the National Anti-Corruption Organization of Thailand, the Office of the Public Sector Anti-Corruption Commission, the Anti-Corruption Organization of Thailand, and other networks on December 9, 2019.

3.4 Disclosure and Transparency

Information Disclosure

Thaioil values disclosure of information to stakeholders on key matters both financial information and non-financial information. The information must be presented in an accurate, complete, simple, timely, and transparent manner, in both Thai and English languages, through accessible channels as follows:

- >> SEC and SET's electronic system
- >> Disclosure Report (Form 56-1) and Annual Report (Form 56-2)
- >> Thaioil's website at www.thaioilgroup.com
- >> Public channels such as newspapers, magazines, executive interviews, news scoop, and press releases
- >> Media Briefings, Analyst Meetings, and Press interviews

Investor Relations

Thaioil is dedicated to build strong relationship between the shareholders, investors and analysts in disclosing its information with correct, reliable, and adequate information in a fair, transparent, and comprehensive matter. Thaioil established Investor Relations Section, as a focal point, to facilitating effective communication with the shareholders and investors, including institutional shareholders, minor shareholders, analysts, and relevant regulatory authorities and to proactively conducting investor relations activities.

In 2019, Thaioil met and shared essential information to the shareholders, investors, and analysts in the following events:

Meeting with Investors/Shareholders

| | |
|---|--|
| Domestic Company Visit | 4 times |
| Domestic Conference Call | 5 times |
| Domestic Roadshow | 10 times |
| International Company Visit | 24 times |
| International Conference Call | 15 times |
| International Roadshow | 7 times |
| Opportunity Day organized by SET | 6 times |
| | (In Thai 4 times/ in English 2 times) |
| SET in the City | 1 time |
| Analyst Meeting | 4 times |
| Knowledge Sharing Session – ERU Project | 1 time |
| Information provided via telephone | 5 times |
| | (average per day) |

Meeting with Credit Rating Institutes

| | |
|---|-------------------------------------|
| Annual Review (S&P's, Moody's, Fitch Ratings) | 3 times |
| | (Once a year for each institute) |
| Conference Call | 15 times |
| | (5 times a year for each institute) |

Information Disclosure

| | |
|----------------------|-----------------|
| SET Community Portal | 30 times |
| Monthly Presentation | 12 publications |

Activities

| | |
|---|---------|
| Shareholders' Site-Visit to Vidyasirimedhi Institute of Science and Technology (VISTEC) | 3 times |
| Investors' Company Site-Visit | 2 times |

Interested parties, shareholders, or investors can request for information from Thailoil's Investor Relations Section via the following channels:



**Thai Oil Public Company Limited
Investor Relations**

555/1 Energy Complex Building A, 11th floor
Vibhavadi Rangsit Road, Chatuchak, Chatuchak,
Bangkok 10900



ir@thailoilgroup.com



+66(0) -2797-2961 (Direct) or
+66(0) -2797-2999 or
+66(0) -2299-0000 ext. 7370-4



+66(0) -2797-2977-8

Prevention of Conflict of Interest

Thailoil published a "Code of Conduct: Conflict of Interest" in the CG and CoC Manual. All Thailoil's employees are required to report their conflict of interest via an electronic system on their first day at Thailoil, the yearly report, or each time a suspected conflict exists. In 2019, Thailoil received 100 percent responses with two unsure cases of conflicts. After a careful investigation, these unsure cases were concluded that they are not in conflict with Thailoil and Subsidiaries' interests.

Moreover, the Board set a policy and guidelines for Directors in the Board Meeting, in which the Directors who have direct or potential conflict of interest shall leave the meeting. The Chairman may authorize such Directors to stay to provide information and allow other Directors to ask question. However, such Directors must abstain from voting on that particular agenda item. The Company Secretary or Secretaries to the Board-Committees must

record the relevance of Directors in minutes of meetings for the Board-Committees' consideration each time this happens.

Policies on the Board's Vested Interest Disclosure and the Purchase or Sell of Company's Shares

To comply with the Capital market Supervisory Board's Announcement, Tor Jor 2/2009, regarding the report on vested interests of Directors, executives, and related parties, Thailoil set a policy for the Directors and high-level executives (from Deputy Managing Directors upward, including Vice Presidents in Finance and Accounting Department) that they are required to report changes in their vested interests to Thailoil and Subsidiaries from the first time they took position, to review them quarterly, and update them annually. Such information is only used within Thailoil.

Thailoil required the Directors and executives, as defined by SEC, have a duty to report the intention to purchase or sell the Company's shares either by self, by spouse, or by cohabiting couples, and minor child to the Company Secretary at least one business day in advance and report the Company's securities holding changes to the SEC within three business days of the transaction date of purchase, sale, or transfer of Company's securities date according to the rules and regulations of SEC. Under section 59 of the Securities and Exchange Act, the Board required the Directors to inform their shareholding information at each Board Meeting, along with disclosing shareholding information of the Directors and executives at the beginning of the year and year-end, and at any time when there are changes in their shareholding information in the annual report. The detail of the 2019 Directors and executives' shareholding information is shown on page 106.

Use of Inside/Confidential Information

Thaioil is fully aware that the use of inside information is crucial and necessary for all listed companies. For that, Thaioil operates under cautious and preventive measures while using such information along with encouraging equality among the shareholders as follows:

- >> **Notified policies and guidelines relating to the use of inside information to the Board, the executives and employees** through various channels, for instance, the Board Chairman's notification at the Board Meeting, etc.
- >> Established **"Code of Conduct: Maintaining Confidential Information and Use of inside Information"** as detailed in the CG and CoC Manual
- >> Established a **"Personal Non-Disclosure Agreement"** between Thaioil, its executives, and employees, who have involved with ongoing projects and projects that have not yet disclosed information to the public, and to be cautious when using such information.
- >> In compliance with the CG principles on buying or selling shares and accessibility of information, **Thaioil sent a written notification to the Directors and executives, requesting their cooperation not to buy, sell, or transfer shares at least one month prior to the submission of the financial report to SET each quarter.**

3.5 Board Responsibilities

The Board, as representatives of the shareholders, plays a significant role in assuring that the Company's operations comply with law, regulations, policies, and ethical codes in a fair and transparent manner. The Board must be independent from the executives, in which Thaioil defined **separation of roles and responsibilities for the Board of Directors, the Board Chairman, and the Chief Executive Officer and President (CEO and President)** as seen on

page 110. The Board also plays significant roles in the following activities:

• Corporate Governance (CG) and Business Code of Conduct

The Board **established the CG Policy, Anti-Corruption Policy, and Business Code of Conduct** for all Directors, executives, and employees to strictly adhere to while operating businesses. This is to assure that businesses are conducted under good ethical standards, transparency, and justification. The Board assigns the Corporate Governance Committee to assure that all operations are in compliance with applicable law, rules, and regulations. This Committee also promotes compliance with CG Policy, Anti-Corruption Policy, the principles of Sustainable Development, etc.

• Define Business Strategies, Policies, and Directions

The Board considers and approves Thaioil's vision, mission, corporate value, business strategies, financial target, budgets, and operational plans. **The Board reviews and approves Thaioil's vision, mission, and business strategies in the Annual Strategic Thinking Session (STS)**, where the Board and the executives jointly review vision, mission, short-term and long-term business strategies against business direction and future trends. In addition, Thaioil's executives are responsible for reporting progress every quarter to the Board during Board meetings. This will allow the Board to keep track of the progress and review appropriate actions to cope with evolving business environment.

• Prevention of Conflict of Interest

The Board plays an important role in monitoring and resolving conflict of interest that may occur among Thaioil's stakeholders. The Board established guidelines regarding conflict of interest transactions. Parties with vested interest should play no part in the decision-making process and must disclose information on conflict of interest in a correct

and complete manner. The details can be found in the “Prevention of Conflict of Interest” section on page 151.

Board's Approval Authority

The Board is authorized to approve Thailoil's businesses under the scopes given by law and in accordance to Thailoil's Articles of Association and the Shareholders' resolutions. An approval framework has been clearly defined for the Board and the executives on various matters, including human resources administration, finance, accounting, etc.

Board Composition

Appointed by the Shareholders' votes at the AGMs, the Board must be qualified, capable, accountable, and generally-accepted and must not have prohibited characteristics specified by the Public Company Limited Act. **Thailoil set a policy for the Board's diversity in genders, skills, professions, and specializations (Competency Matrix);** namely, energy, petroleum, petrochemical, engineering, financial accounting, security, information technology and digital, business management, organization management, corporate governance, innovation and environment. To date, the number of Thailoil's Independent Directors exceeded that required by law. Independent Directors must also be fully qualified by the requirements of the Capital Market Supervisory Board as well as Thailoil's Independent Directors' Qualification, which is in consistent and stricter than the requirement of the Capital Market Supervisory Board. The details can be found in this annual report on page 154. Moreover, the Board must consists of Independent Directors of at least one-third of all Directors and the number must be at least three.

To assure that the Board devotes their time and effort to perform their duties for the highest benefit of the Company, the Board approved the amendment of the criteria of

the number of directorship in listed companies, in which **Thailoil's Directors can serve no more than three listed companies, stricter from the previous criteria of no more than five listed companies.** This amendment constituted the improvement of Thailoil's corporate governance practices and in accordance with good corporate governance principles.

Presently, Thailoil's Board of Directors consisted of 15 Directors, with one executive Director and 14 non-executive Directors, six of whom were Independent Directors. The names of members of the Board can be found on page 76. Additionally, Thailoil established four separate Board-Committees, namely: the Audit Committee; the Nomination and Remuneration Committee; the Corporate Governance Committee; and the Risk Management Committee. The names of members and responsibilities of each Committee can be found in the “Board-Committees” section on page 154. Thailoil also disclosed the number of meeting and Directors' meeting attendance in the “Meeting Attendance” section on page 112.

Nomination and Appointment of the Board

Nomination Criteria

In selecting and considering an appropriate Director Candidate, Thailoil invited minor and major shareholders to nominate a Director Candidate, which must obtain an approval from Thailoil's Board. **The Directors must be fully qualified with the Public Company Limited Act, in which Thailoil will not bring diversity factors such as gender, race, ethnicity, country of origin, or nationality as Directors' qualification restrictions.** Thailoil also values independence of the Directors, their conflict of interest, and their expertise. Thailoil developed **Board Skill Matrix in accordance with the Board Diversity Policy** to create a wide range of expertise in line with Thailoil's strategic

directions. Thailoil also searched and selected qualified Directors through the State Enterprise Policy Office's Directors Pool and the IOD Chartered Directors. As of December 31, 2019, seven out of 15 Thailoil Directors' name were included in the State Enterprise Policy Office's Directors Pool.

Independent Directors' Qualifications

Independent Directors shall be independent from major shareholders and Thailoil's executives. They shall also have adequate access to financial and business information in order to provide a free opinion to protect the best interest of all shareholders. They must also attend the Board's meeting regularly.

Thailoil clearly defined Independent Directors' qualification that is in consistent and more intense than the requirement of the Capital Market Supervisory Board, for instance, shareholding of no more than 0.5 percent of the total number of shares with voting rights of Thailoil, its parent company, subsidiary, affiliate, major shareholder or controlling person, including shares held by their related persons. These qualifications can also be found in Thailoil's CG and CoC Manual, which is publicly disclosed via Thailoil's website. Additionally, Thailoil defined Independent Directors' term of office, in which each Independent Director shall serve no more than six consecutive years from the date of the appointment.

Appointment of New Directors

- **To appoint Directors to replace those who have completed their terms**, Thailoil provides an opportunity for shareholders to propose qualified Directors Candidates, in accordance with relevant laws and Thailoil's requirements, by announcement through Thailoil's website well before the AGM meeting. Afterward, the Nomination and Remuneration Committee selects and proposes to the Board for

consideration of the names of qualified candidates prior to the Shareholders' approval in the AGM. After the Board's endorsement, the list of qualified candidates is proposed to the AGM, individually, to approve the election by majority votes, whereas one shareholder has one vote per share. Shareholders may exercise all the votes they have to elect one or several persons as Director or Directors, however, they cannot divide their votes to any person in any number.

- **To appoint Directors in case of vacancy due to reasons other than expiration of term**, the Nomination and Remuneration Committee considers criteria and nominates qualified persons, in accordance with the law and regulations, to fill the vacant posts and proposes them to the Board for consideration. With votes of no less than three-fourths of the remaining Directors, a selected Director will serve only the remainder of the term of the replaced Director.

- **The appointment of Director as Member of the Board-Committees**, the Nomination and Remuneration Committee considers qualified Director as a Member of the Board-Committee to fill vacancies. This must be done in accordance with the Board-Committees' Charters. The names of selected Directors are to be proposed to the Board for consideration and approval.

Board-Committees

The Board appointed Board-Committees to scrutinize and supervise the Company's operations, in accordance to assigned roles and responsibilities. The Board also defined qualifications, terms of office, roles and responsibilities, reporting, and evaluation of each of the Board-Committee's Charter. Additionally, the Board required each Board-Committee to report their progress on a regular basis.

1) The Audit Committee

Appointed by the Board, the Audit Committee consisted of fully qualified members against the SEC and SET Requirements with a minimum of three Independent Directors and at least one of whom must be adequately qualified and experienced in reviewing the credibility of financial statements.

The Audit Committee, as of December 31, 2019, consisted of three Directors as follows:

| Name | Position |
|--------------------------------------|---|
| 1. Mr. Kanit Si | Chairman (Independent) with qualified knowledge and experience in accounting and finance to review the reliability of financial statement |
| 2. Assoc. Prof. Dr. Pasu Decharin | Member (Independent) |
| 3. Mr. Praphaisith Tankeyura | Member (Independent) with qualified knowledge and experience in accounting and finance to review the reliability of financial statement |

Mrs. Prapin Thongnium, Vice President Corporate Internal Audit, the Chief of Thailoil's Internal Audit Section, serves as Secretary to the Audit Committee

The Audit Committee reviews the efficiency and effectiveness of corporate governance, risk management, and internal control processes; reviews the Company's financial reporting process to ensure accuracy, credibility, and sufficient information and in compliance with the Thai Financial Accounting Standards; reviews the connected transactions or transactions that may lead to conflict of interest and information disclosure as required by law, rules, and regulations of the Stock Exchange of Thailand; considers to select, nominate, re-elect, and terminate the

Company's external auditors and to propose the auditors fee; reviews and provides opinions on internal audit plan and system to meet internationally accepted standard; considers the independence of the Corporate Internal Audit Department including the adequacy of the budget and workforce of this Department; and approves the appointment, rotation, and evaluates the annual performance of Vice President - Corporate Internal Audit Department.

In 2019, the Audit Committee performed its duties under the aforementioned roles as shown in the Audit Committee Report on page 14.

2) The Nomination and Remuneration Committee

Appointed by the Board, the Nomination and Remuneration Committee consisted of at least three Directors, most of whom must be Independent Directors and must not be the Company's executive. All of the members are fully qualified as Directors in accordance with the Nomination and Remuneration Committee Charter.

The Nomination and Remuneration Committee, as of December 31, 2019, consisted of three Directors as follows:

| Name | Position |
|-----------------------------------|---------------------------|
| 1. ACM Suttipong Inseeyong | Chairman (Independent) |
| 2. Assoc. Prof. Dr. Pasu Decharin | Member (Independent) |
| 3. Mr. Attapol Rerkpiboon | Member |

Mr. Viroj Meenaphant, Executive Vice President Corporate Governance and Affairs and Company Secretary, serves as Secretary to the Nomination and Remuneration Committee

The roles and responsibilities of the Nomination and Remuneration Committee are as follows:

Nomination Role - considers the Board's composition and qualifications of individual Director for the Board; selects

qualified Directors to take position in the Board-Committees and table their names to the Board for consideration and approval in case of vacancy; considers the qualifications of the CEO and President to suit the Company's business management in order to achieve its objectives; develops and reviews the succession plan of CEO and President as continuous preparation plan for readiness and successor to ensure business continuity of management and operations.

Remuneration Role - reviews and proposes remuneration form and criteria to suit the responsibilities of the Board by taking the Company's overall performance into consideration to motivate and retain Directors with competency, quality, and potentiality prior to table them to the AGM for shareholders' approval; and conducts the performance evaluation and considers an appropriate remuneration for the CEO and President before proposing to the Board for approval.

In 2019, the Nomination and Remuneration Committee performed its duties under the aforementioned roles as shown in the Nomination and Remuneration Committee Report on page 20.

3) The Corporate Governance Committee

Appointed by the Board, the Corporate Governance Committee consisted of at least three Non-Executive Directors, most of whom must be Independent Directors. All of the members are fully qualified as Directors in accordance with the Corporate Governance Committee Charter.

The Corporate Governance Committee, as of December 31, 2019, consisted of three Directors as follows:

| Name | Position |
|-----------------------------|------------------------|
| 1. Pol. Gen. Aek Angsanant | Chairman (Independent) |
| 2. Gen. Kukiart Srinaka | Member (Independent) |
| 3. Mr. Yongyut Jantararotai | Member |

Mr. Viroj Meenaphant, Executive Vice President Corporate Governance and Affairs and Company Secretary, serves as Secretary to the Corporate Governance Committee

The Corporate Governance Committee defines corporate governance policies, practices, and related operations including sustainability management and corporate social responsibility aspects to conform to principles, standards, and requirements stipulated by the SET, SEC, and other recognized institutions domestically and internationally; supervises and monitors the Company's operations to ensure compliance with established policies and practices, in order for continuous CG development; promotes CG culture; provides advice in the participation of CG-related assessment and rating; and considers the Board's performance evaluation form and approves the overall evaluation before proposing to the Board.

In 2019, the Corporate Governance Committee performed its duties under the aforementioned roles as shown in the Corporate Governance Committee Report on page 17.

4) The Risk Management Committee

Appointed by the Board, the Risk Management Committee consisted of a minimum of three Directors, with the CEO and President serving a member. All of the members are fully qualified as Directors in accordance with the Risk Management Committee Charter.

The Risk Management Committee, as of December 31, 2019, consisted of four Directors as follows:

| Name | Position |
|--------------------------------|---|
| 1. Mr. Attapol Rerkpiboon | Chairman |
| 2. Ms. Chularat Suteethorn | Member |
| 3. Ms. Phannalin Mahawongtikul | Member |
| 4. Mr. Wirat Uanarumit | Member / Chief Executive Office and President |

Mr. Pongpun Amornvivat, Executive Vice President Strategy serves as Secretary to the Risk Management Committee

The Risk Management Committee defines and reviews risk management framework, the Risk Management Charter, risk management policies and process; as well as suitably and effectively suggests guidelines to risk management relating to the Company's business to correspond with business strategies, business plans, and volatile circumstances; continuously promotes and develops risk management and tools in all levels across the organization to encourage risk management culture in organization; supervises, monitors, and reviews key risk management plans and report.

In 2019, the Risk Management Committee performed duties under the aforementioned roles as shown in the Risk Management Committee Report on page 22.

Board Meetings

Board meetings are scheduled in advance each year so that the Directors can schedule themselves to attend. The Board have been informed of the 2020 Board Meetings schedule in November 2019. **Meeting invitations, draft of minutes of the previous meeting, and current meeting documents are delivered to Directors** at least seven days or at least five business days **in advance of the Board meeting date**, with exception to urgent matters. In the Board meetings, Chairman of the Board serves as the Chairman of the meeting, encouraging all Directors to openly discusses and express their opinions. High-level executives are invited to attend Board meetings to provide additional relevant information and allow the Board to get to know them, which will be useful for the review of succession plans.

The Board sets a policy that requires no less than two-thirds of the current Board members in attendance and vote counts to make a quorum, unless where there is an urgent need to conduct a meeting which may otherwise jeopardize Thailoil's operation, or in the event of an urgent call for a meeting, or any other reasons where the Board deems appropriate.

In 2019, Thailoil managed a total of 12 Board Meetings, including one Strategic Thinking Session (STS). This year, the average percentage meeting attendance stands at 96%. Additionally, Thailoil managed one Non-Executive Directors Meeting without the executives and one Independent Directors Meetings to encourage the Directors to independently discuss, recommend, and openly express their opinions during these meetings without the Company's executives. The details on the Board's meeting attendance can be found on page 112.

Directors' Remuneration

It is Thailoil's policy to compensate Directors reasonably to motivate and retain quality Directors, or at levels comparable to industrial practices. Directors' compensation is linked to each Director's performance and responsibilities as well as Thailoil's performance and benefits to the shareholders. Directors tasked with greater responsibilities are paid more accordingly, and the Chairman of the Board and Chairman of the Board-Committees may likewise receive higher compensation than others. The Nomination and Remuneration Committee sets the remuneration principles and payment method, and present it to the Board and the AGM for approval, respectively. The 2019 AGM reviewed compensation for the Board and Board-Committees is disclosed in the "Director's Remuneration" section on page 122 and the individual Director's compensation can be found in the "2019 Remuneration of Directors" section on page 124.

Directors' Development

Orientation of New Directors

Thaioil encourages high-level executives to personally provide information on the nature of Thaioil and Subsidiaries' businesses along with essential data that are beneficial to the performance of the Directors. In addition, Thaioil prepares a welcoming package for new Directors to provide essential information, including the Board meeting schedule, business overview, business structures, and strategic plans and other information such as the CG and CoC Manual, Board-Committees' Charters, Independent Director Handbook (for Independent Directors), etc.

Performance Development of the Board

Thaioil promotes the development of Directors by encouraging Directors to attend trainings conducted by the Thai Institutes of Directors (IOD), other courses and seminars as part of continuous development to support their duties as members of the Board. In addition, Thaioil invites external experts to the Board meetings to share their knowledge and experience with the Directors and organizes a Board meeting and/or site visit at the Thaioil Refinery to visit and oversee refinery operations as well as to keep track of its performance. The details on Board Training Courses can be found on page 162.

Board's Performance Assessment

Annually, Thaioil conducts the Board's performance assessment in three parts, namely:

- 1) Board and Board-Committees Assessment
- 2) Individual Director Assessment (Self-Assessment)
- 3) Peer Assessment (Cross-Assessment)

In 2019, the Corporate Governance Committee appointed an independent and external consultant, namely, AON Hewitt (Thailand) Ltd., to facilitate this year's Board Assessment.

This practice is in accordance to the guidelines of Corporate Governance Code for Listed Companies 2017, published by the Securities and Exchange Commission, Thailand (SEC). The guidelines suggested that this shall be done at least once every three years. The opinions and recommendations derived from the assessment will be used to develop future Board's performance improvement program.

Board's Performance Assessment Process

Assigned by the Board, the Corporate Governance Committee is tasked to review and endorse all three Board's performance assessment forms to assure that they are complete and align with prevailing circumstances. This year, the Committee approved the 2019 Board's performance assessment form, arranged by external consultant. After the Committee's approval, the assessments are distributed all Directors. To provide greater efficiency to assessment and analysis process, the consultant conducted personal interview with each Director to extract opinions and information for effective and accurate analysis. The Board's assessment outcomes were summarized to the Corporate Governance Committee for approval and to the Board of Directors for acknowledgment, respectively.

Board's Performance Assessment Criteria

The Board's performance assessment covered comprehensive range of significant issues, such as Board's composition, qualifications, and performance; Board's roles and responsibilities; Board's supervision and monitoring; reporting and information disclosure; risk management and internal control; Board's development; etc. The evaluation criteria are divided into 5 levels as follows:

- Level 1 - Need significant improvement
- Level 2 - Partially meet expectations
- Level 3 - Meet expectations
- Level 4 - Exceed expectations
- Level 5 - Exemplary

The 2019 Board's Performance Assessment can be summarized as follows:

| Evaluation | 2019 Rating |
|--|-------------|
| Part 1 : Board and Board-Committees Assessment | 4.8 |
| - Audit Committee | 5.0 |
| - Corporate Governance Committee | 4.9 |
| - Nomination and Remuneration Committee | 5.0 |
| - Risk Management Committee | 4.9 |
| Part 2 : Individual Director Assessment (Self-Assessment) | 4.6 |
| Part 3 : Peer Assessment (Cross-Assessment) | 4.6 |
| Average Rating (Part 1-3) | 4.7 |

Remark: The above evaluation results are conducted by independent and external consultant. The assessment forms used in the assessment is different from the previous year, therefore, the results should not be used in comparison to existing historical rating.

The overall result of the 2019 Board Assessment indicated an average rating with an average score of "4.7".

Nomination, Appointment, Position-Holding Policy, and Succession Plan for Chief Executive Officer and President

To nominate and appoint qualified persons to fill the vacant position of the highest level of executives (the Chief Executive Officer and President), the Nomination and Remuneration Committee is to consider the qualifications, experiences, and potential conflicts of qualified persons that will prove beneficial to Thaioil and submit them to the Board for consideration and approval.

Additionally, in order to bolster shareholders' and investors' confidence that Thaioil and Subsidiaries' business will continue its excellence, Thaioil has established a succession plan for this position. A qualified person must meet the criteria and is ready for the position in the future. Thaioil annually reviewed on its succession plan.

The Board allowed the CEO and President to serve as Director of subsidiary companies to ensure a unity and to mutually support Thaioil and Subsidiaries' operations for maximum efficiency and effectiveness. The Board defined **guidelines for Thaioil's executives and employees that were invited to serve in other companies, agencies, or entities** in Thaioil's CG and CoC Manual. It states that, if the CEO and President is to be appointed as a member of a committee, he or she is to inform or seek endorsement from the Board before assuming the position. If the matter applies to executives or employees, the matter is to be raised to the Assistant Managing Directors Meeting (AMM) for acknowledgment or endorsement.

CEO and President's Performance Assessment

Thaioil executed CEO and President's Performance Assessment annually. The Nomination and Remuneration Committee is in charge of the annual performance

assessment of the CEO and President. The Committee is to forward the assessment outcome to the Board for endorsement. The CEO and President's performance assessment has two parts (each part has a different weight percentage) as follows:

Part 1 - Corporate Key Performance Indicators

Part 2 - Leadership Competency

The performance appraisal outcome influences the salary raise for the CEO and President and is to be presented to the Board for further approval.

Compensation for the CEO and President

Thaioil defined a clear criteria in regards to the remuneration of the CEO and President and is agreed by the CEO and President in advance. **Each year, the Nomination and Remuneration Committee appraises the CEO and President's annual performance.** The Committee then recommends its findings to the Board for endorsement, and the Chairman then informs the CEO and President on the decision. The compensation policy also links the CEO and President's performance to overall short-term performance and long-term operating performance in line with strategic directions. Additionally, Thaioil utilizes the four dimensions of Balance Scorecard concept: namely, sustainability, stakeholders, internal process, and learning and development, to develop Corporate Key Performance Indicators (Corporate KPI), which is also linked to the CEO and President's Performance.

However, in some cases, Thaioil set guidelines to the appropriateness of its business nature and environment, for instance, **the Cumulative Voting**, where Thaioil's Articles of Association indicates that the nomination of Director requires shareholders' resolution by majority vote

and that each shareholder has voting counts equivalent to their shareholdings, Thaioil constantly protects the rights of minor shareholders by providing them the opportunities to nominate Director candidate in advance. Additionally, based on good governance practice, **the number of Directors on the Board** should consist of 5-12 directors. As of December 31, 2019, Thaioil's Board consisted of 15 Directors. This follows Thaioil's Article of Association, which indicates that the Board is to contain no less than five and no more than 15 Directors to enable the Board to command a proper size for its complexity.

4. Supervision of Thaioil and Subsidiaries' Operations

Thaioil defined the Thaioil Group Affiliates Management (TAM) Policy with explicit roles and responsibilities of assigned representatives to manage all subsidiaries, in order to assure that they conform with strategic directions. This would in-turn lead to the achievements of long-term goals and sustainable growth. The TAM Policy includes Subsidiaries' management, duties and responsibilities of assigned representatives. **The Corporate Governance and Anti-Corruption Policies are parts of this TAM Policy, in which Thaioil and Subsidiaries are required to adhere to such policies while managing businesses.**

Connected Transactions or Acquisition or Disposal of Assets

Thaioil established its Connected Transaction Policy on a fair and at arm's length basis and in compliance with the rules and regulations of the SEC and accounting standards. **The Audit Committee then provided opinions on the suitability of connected transactions.** If the Audit Committee lacked expertise to consider such matter, Thaioil will secure the opinions from a qualified person. **Afterward, these opinions will be proposed to the Board or AGM for case-by-case approval.**

In case of Thaioil or its subsidiaries* involves in a connected transaction or an activity in which substantial assets of Thaioil are acquired or disposed of, according to SET's principles, Thaioil must take action stipulated by SET. This requires approval from the shareholders to enter a connected transaction or to acquire or dispose of substantial assets of Thaioil, with a majority vote of no less than three-fourths of all votes of the shareholders or proxies attending the meeting, and eligible to vote without counting the votes of shareholders involved in the conflicts of interest.

(* Companies in which Thaioil, directly or indirectly, has a shareholding of more than 50 percent of the registered paid-up capital)

Thai Institute of Directors Association (IOD) Courses attended by Directors

| Director | Position | Director Certification Program (DCP) | Director Accreditation Program (DAP) | Audit Committee Program (ACP) | Role of the Compensation Committee (RCC) | Role of the Nomination and Governance Committee (RNG) | Role of the Chairman Program (RCP) | Financial Statements for Directors (FSD) | Others |
|------------------------------------|--|--------------------------------------|--------------------------------------|-------------------------------|--|---|------------------------------------|--|--|
| 1 Prof. Dr. Thosaporn Sirisumphanh | Director and Chairman of the Board | DCP 80/2006 | | | | | | | FND 30/2006 DCPU 4/2015 |
| 2 Mr. Kanit Si | Independent Director and Chairman of the Audit Committee | DCP 28/2003 | | | | | | | FND 5/2003 ELP 16/2019 AAP 35/2019 |
| 3 Ms. Chularat Suteethorn | Director and Member of the Risk Management Committee | DCP 72/2006 | DAP 40/2005 | ACP 39/2012 | RCC 20/2015 | RNG 3/2012 | RCP 28/2012 | FSD 10/2010 | FND 28/2006 FCP 4/2012 ACEP 10/2014 AAP 15/2014 DCPU 4/2015 ELP 7/2017 BNCP 1/2017 BMT 6/2018 |
| 4 Assoc. Prof. Dr. Pasu Decharin | Independent Director, Member of the Audit Committee and Member of the Nomination and Remuneration Committee | DCP 280/2019 | DAP 121/2015 | | | | | | |
| 5 Mr. Praphaisith Tankeyura | Independent Director and Member of the Audit Committee | DCP 249/2017 | | | | | RCP 43/2018 | | AACP 29/2018 BMT 7/2019 BNCP 7/2019 |
| 6 ACM Suttipong Inseeyong | Independent Director and Chairman of the Nomination and Remuneration Committee | DCP 267/2018 | DAP 114/2015 | | | | | FSD 37/2018 | AACP 31/2018 |
| 7 Mr. Auttapol Rerkpiboon | Director, Chairman of the Risk Management Committee and Member of the Nomination and Remuneration Committee | DCP 173/2013 | | | | | | | CSP 14/2005 |
| 8 Pol. Gen. Aek Angsanant | Independent Director and Chairman of the Corporate Governance Committee | DCP 111/2008 | | | | | RCP 42/2018 | | BMT 4/2017 ELP 16/2019 CGI 22/2019 AAP 34/2019 |
| 9 Mr. Yongyut Jantaradai | Director and Member of the Corporate Governance Committee | DCP 237/2017 | | | | | | FSD 31/2016 | CGE 5/2015 BMT 5/2018 ELP 16/2019 |
| 10 Gen. Kukiat Srnaka | Independent Director and Member of the Corporate Governance Committee | DCP 275/2019 | | | | | | | |
| 11 Mr. Praphon Wongtharua | Director | DCP 218/2016 | | | | | | FSD 31/2016 | BMD 4/2017 RCL 13/2018 ITG 8/2018 AAP 32/2019 SFE 31/2019 |
| 12 Ms. Phannalin Mahawongtikul | Director and Member of the Risk Management Committee | DCP 279/2019 | | | | | | | |
| 13 Mr. Preecha Pocatanaawat | Director | DCP 261/2018 | | | | | | | |
| 14 Ms. Duangporn Thiangwanatham | Director | DCP 135/2010 | | | | | | FSD 8/2010 | BMT 8/2019 DDP 1/2019 (PTT In-house course) |
| 15 Mr. Wirat Unanarut | Director, Member of the Risk Management Committee, Chief Executive Officer and President, Secretary to the Board | DCP 8/2001 | | | | | | | ACP 38/2012 DCPU 5/2015 ELP 7/2017 |

| Director | Position | Director Certification Program (DCP) | Director Accreditation Program (DAP) | Audit Committee Program (ACP) | Role of the Compensation Committee (RCC) | Role of the Nomination and Governance Committee (RNG) | Role of the Chairman Program (RCP) | Financial Statements for Directors (FSD) | Others |
|---|--|---|---|--|---|---|---|---|---|
| Directors who resigned during the year 2019 | | | | | | | | | |
| 1 Mr. Suchalee Sumamal | Director (Resigned on January 1, 2019) | DCP 255/2018 | DAP 142/2017 | | | | | | |
| 2 Mr. Noppadol Pinsupa | Director and Member of the Risk Management Committee (Resigned on January 31, 2019) | DCP 146/2011 | | | | | | FSD 12/2011 | |
| 3 Mr. Chen Namchaisiri | Independent Director and Member of the Audit Committee (Resigned on May 10, 2019) | DCP 138/2010 | DAP 11/2004 | | | | | | EXAM 30/2011 AACP 32/2019 RCL 17/2019 |
| 4 Mr. Atikom Terbsiri | Director, Member of the Risk Management Committee, Chief Executive Officer and President, Secretary to the Board (Resigned on September 1, 2019) | DCP 125/2009 | | | | | RCP 41/2017 | | RCL 4/2016 |

Director's Training Course in year 2019

| No. | Name - Surname | Position | Training Course in year 2019 |
|-----|----------------------------------|---|--|
| 1 | Prof. Dr. Thosaporn Sirisumphand | Director and Chairman of the Board | >> Seminar: "How to Transform Your Business to Become an Exponential Company in a Digital Era", Faculty of Commerce and Accountancy, Chulalongkorn University |
| 2 | Mr. Kanit Si | Independent Director and Chairman of the Audit Committee | >> Ethical Leadership Program (ELP 16/2019) >> Advanced Audit Committee Program (AACP 35/2019) >> Audit Committee Forum: "Strategic Audit Committee: Beyond Figure and Compliance" |
| 3 | Ms. Chularat Suteethorn | Director and Member of the Risk Management Committee | >> Independent Director Forum 1/2019: "Tips and Tricks for Dealing with Questions in AGM" >> IOD National Director Conference 2019: "Board of the Future" >> Thailand Insurance Leadership Program, Class 9, Office of Insurance Commission |
| 4 | Assoc. Prof. Dr. Pasu Decharin | Independent Director, Member of the Audit Committee and Member of the Nomination and Remuneration Committee | >> Director Certification Program (DCP 280/2019) >> Audit Committee Forum: "Strategic Audit Committee: Beyond Figure and Compliance" |
| 5 | Mr. Praphaisith Tankeyura | Independent Director and Member of the Audit Committee | >> Board Matters and Trends (BMT 7/2019) >> Board Nomination and Compensation Program (BNCP 7/2019) |
| 6 | ACM Suttipong Inseeyong | Independent Director and Chairman of the Nomination and Remuneration Committee | >> The Executive Program in Energy Literacy for a Sustainable Future, Class 13, Thailand Energy Academy >> Advanced Master of Management (AMM), Class 3, Graduate School of Public Administration, >> National Institute of Development Administration >> Independent Director Forum 1/2019: "Tips and Tricks for Dealing with Questions in AGM" |
| 7 | Pol. Gen. Aek Angsanant | Independent Director and Chairman of the Corporate Governance Committee | >> Ethical Leadership Program (ELP 16/2019) >> Corporate Governance for Capital Market Intermediaries (CGI 22/2019) >> Advanced Audit Committee Program (AACP 34/2019) >> Independent Director Forum 1/2019: "Tips and Tricks for Dealing with Questions in AGM" >> Thailand's 10 th National Conference 2019: Collective Action against Corruption "Innovation in the Fight against Corruption" |

| No. | Name - Surname | Position | Training Course in year 2019 |
|-----|--------------------------------|---|---|
| 8 | Mr. Yongyut Jantarotai | Director and Member of the Corporate Governance Committee | >> Ethical Leadership Program (ELP 16/2019) |
| 9 | Gen. Kukiart Srinaka | Independent Director and Member of the Corporate Governance Committee | >> Director Certification Program (DCP 275/2019) |
| 10 | Mr. Praphon Wongtharua | Director | >> Advanced Audit Committee Program (AAP 32/2019) >> Successful Formulation & Execution of Strategy (SFE 31/2019) >> 2019 PTIT Special Lecture: "Revisiting the Resource Revolution Arsenal & Defining Thailand's Destiny" >> Top Executive Program in Commerce and Trade (TEPCoT), Class 12, Commerce Academy, University of the Thai Chamber of Commerce |
| 11 | Ms. Phannalin Mahawongtikul | Director and Member of the Risk Management Committee | >> Director Certification Program (DCP 279/2019) >> IOD National Director Conference 2019: "Board of the Future" |
| 12 | Mr. Preecha Pocatanaawat | Director | >> IOD National Director Conference 2019: "Board of the Future" |
| 13 | Ms. Duangporn Thiengwatanatham | Director | >> Board Matters and Trends (BMT 8/2019) >> Director Development Program (DDP 1/2019) (PTT In-house Course) >> 2019 PTIT Special Lecture: "Revisiting the Resource Revolution Arsenal & Defining Thailand's Destiny" |

Directors who resigned during the year 2019

| | | | |
|---|-------------------------------------|---|---|
| 1 | Mr. Noppadol Pinsupa ⁽¹⁾ | Director and Member of the Risk Management Committee | >> The Executive Program in Energy Literacy for a Sustainable Future, Class 14, Thailand Energy Academy |
| 2 | Mr. Chen Namchaisiri ⁽²⁾ | Independent Director and Member of the Audit Committee | >> Advanced Audit Committee Program (AAP 32/2019) >> Risk Management Program for Corporate Leaders (RCL 16/2019) |
| 3 | Mr. Atikom Terbsiri ⁽³⁾ | Director, Member of the Risk Management Committee, Chief Executive Officer and President and Secretary to the Board | >> PTIT Public Lecture on "Global Oil & Gas Markets in Turmoil-Implications for Thailand" |

Remarks :

⁽¹⁾ Mr. Noppadol Pinsupa resigned from directorship on January 31, 2019.

⁽²⁾ Mr. Chen Namchaisiri resigned from directorship on May 10, 2019.

⁽³⁾ Mr. Atikom Terbsiri resigned from directorship on September 1, 2019.

THAIOIL AND SUBSIDIARIES' SOCIAL RESPONSIBILITY



Thaioil and Subsidiaries' performance concerning social and environmental responsibility was disclosed in the 2019 Integrated Report.

In preparing the 2019 Integrated Report, Thaioil followed the Integrated Reporting Framework of the International Integrated Reporting Council (IIRC) and selected material issues in line with the Materiality Assessment Process under the core level of Global Reporting Initiative Standards (GRI Standards) with additional indicators for the GRI Oil and Gas Sector Disclosure. Thaioil also presented the progress of the implementation of the United Nations Global Compact's (UNGC's) 10 principles as well as the United Nations Sustainable Development Goals (UN SDGs).

Materiality Assessment of Thaioil and Subsidiaries' Sustainability

01 | Identification

The 2019 material sustainability issues of the business were analyzed by both internal and external drivers. Internal drivers reflect results of SWOT analysis, corporate risk profile, short-term, medium-term and long-term business strategic direction, and materiality assessment results from the previous year. External drivers reflect issues of interest communicated by the Dow Jones Sustainability Indices (DJSI), UN SDGs, national and global mega trends, and the identified sustainability issues derived from the interview of six groups of key stakeholders.

02 | Prioritization

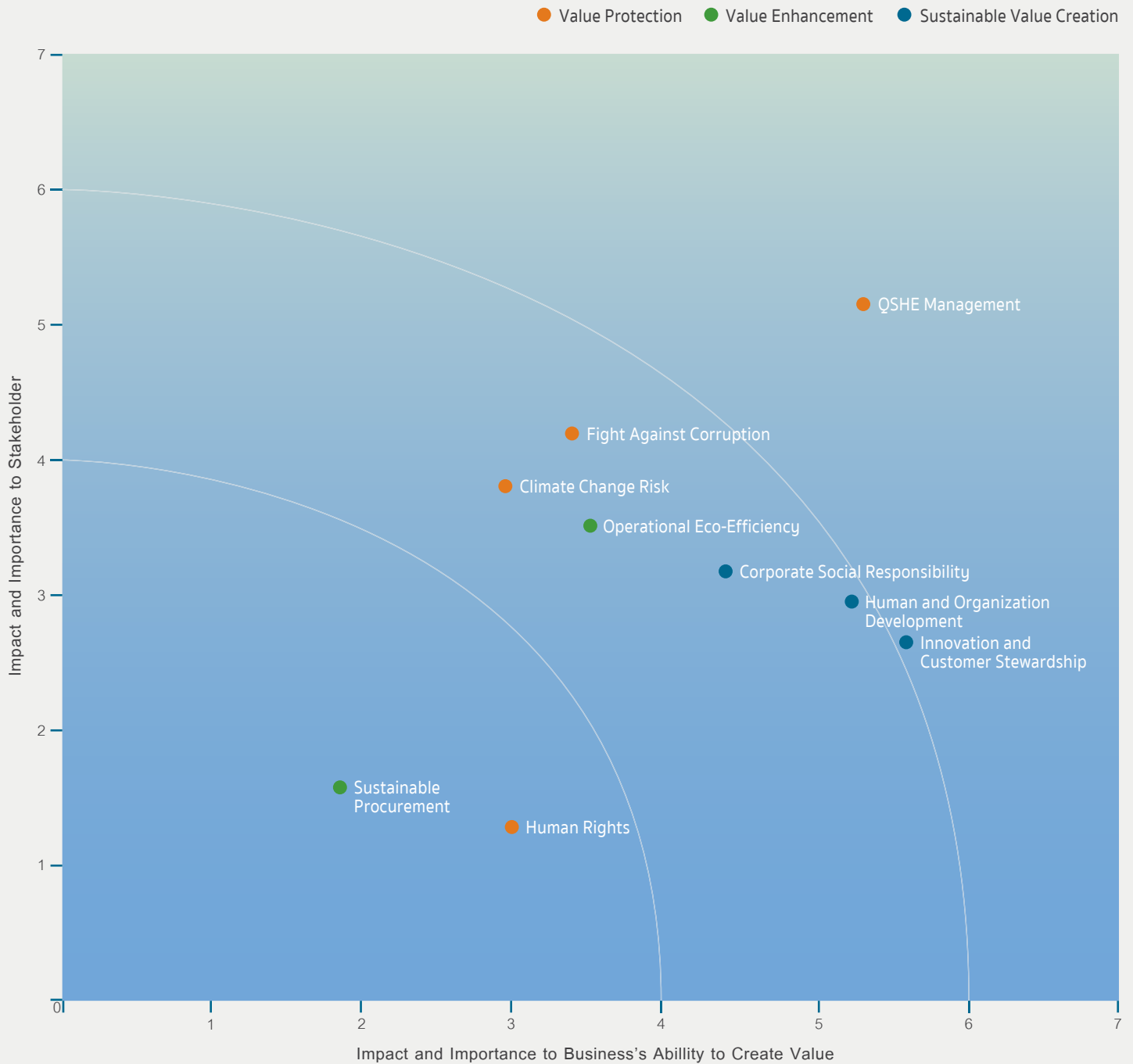
The 2019 material sustainability issues were prioritized by interviewing six groups of key stakeholders, and the executives of Thaioil and Subsidiaries. Each material issue was assessed on a scale of 1-7 based on two dimensions: 1) impacts and importance to Thaioil's ability to create value and 2) impacts and importance to stakeholders.

03 | Validation

Sustainable development function was the first line to review and validate the completeness and appropriateness of the prioritized material issues. Then, the results were presented to the top executives of Thaioil and Subsidiaries, chaired by the CEO and President, for a final review and endorsement of the material sustainability issues under the scope of impacts inside and outside the corporation.

In addition, the materiality assessment process, including the stakeholder engagement process, and the collection and compilation of data related to our safety and the environment performance were all assured by an external independent verifier in order to ensure accuracy, transparency and completeness.

2019 Materiality Assessment Results





CORPORATE INFORMATION

Thai Oil Public Company Limited

| | |
|--|---|
| Monogram | TOP |
| Registration Number | 0107547000711 |
| Business | <p>Thaioil is Thailand's largest refinery and supplier of petroleum products. Founded in 1961, we operate one of the most efficient refineries in Asia Pacific with the current capacity of 275,000 barrels per day.</p> <p>Thaioil operates under the Operational Excellence principle, operating as an integrated group of businesses in oil refinery, petrochemicals and lube base oil with supporting businesses, e.g. power generation, solvents, marine and pipeline transportation, renewable energy generation, LAB: an intermediate in the production of surfactants, business in the area of International Business Center and Treasury Center, as well as recruitment services for Thaioil and Subsidiaries. Thaioil leads the Thai refinery industry through a well-planned and integrated production process, yielding optimum efficiency. Our product quality are high, rated in the top quartile of refineries in Asia Pacific at lower production costs, giving Thaioil a recognized competitive advantage.</p> |
| Registered Capital | <p>20,400,278,730 Baht</p> <p>Comprising 2,040,027,873 fully paid-up common shares of 10 Baht per share</p> |
| Number of Employees (As of December 31, 2019) | <p>658 persons under Thai Oil Public Company Limited</p> <p>980 persons under Thaioil Energy Services Company Limited</p> |
| Address | <p>Bangkok Office</p> <p>555/1 Energy Complex Building A, 11th Floor, Vibhavadi Rangsit Road, Chatuchak, Chatuchak, Bangkok 10900, Thailand</p> <p>Telephone : +66(0) -2797-2999, +66(0) -2797-2900, +66(0) -2299-0000</p> <p>Fax : +66(0) -2797-2970</p> <p>Sriracha Office and Refinery</p> <p>42/1 Moo 1, Sukhumvit Road Km.124, Tungsukla, Sriracha, Chonburi 20230, Thailand</p> <p>Telephone : +66(0) -3840-8500, +66(0) -3835-9000</p> <p>Fax : +66(0) -3835-1554, +66(0) -3835-1444</p> |
| Website | www.thaioilgroup.com |
| Investor Relations | <p>Telephone : +66(0) -2797-2961</p> <p>e-mail : ir@thaioilgroup.com</p> |

General Information of the Subsidiaries

| Company Name and Address | Registration Number | Business | Registered Capital (Baht) | Type of Shares | Number of Shares (Issued) | Value of Share (Baht per share) | Shareholding (%) |
|---|---------------------|--|---------------------------|----------------|---------------------------|---------------------------------|--|
| Lube Base Oil Business | | | | | | | |
| Thai Lube Base Public Company Limited 555/1 Energy Complex Building A, 11 th Floor, Vibhavadi Rangsit Road, Chatuchak Chatuchak, Bangkok 10900, Thailand Tel : +66(0) -2299-0000, +66(0) -2797-2999 Fax : +66(0) -2797-2970 | 0107539000090 | Lube base oil manufacturer and distributor | 1,757,890,730 | Common | 175,789,073 | 10 | 100 |
| Petrochemical Business | | | | | | | |
| Thai Paraxylene Company Limited 105/12 Moo 2 Sukhumvit Road, Tungskula, Sriracha, Chonburi 20230, Thailand Tel : +66(0) -3835-1317-9, +66(0) -3835-1878 Fax : +66(0) -3835-1320 | 0105539103288 | Upstream petrochemical manufacturer and distributor | 2,572,414,160 | Common | 257,241,416 | 10 | 100 |
| Labix Company Limited 555/1 Energy Complex Building A, 11 th Floor, Vibhavadi Rangsit Road, Chatuchak, Chatuchak, Bangkok 10900, Thailand Tel : +66(0) -2299-0000, +66(0) -2797-2999 Fax : +66(0) -2797-2974 | 0105556110246 | LAB (an intermediate in the production of surfactants such as detergents) manufacturer and distributor | 4,654,965,000 | Common | 465,496,500 | 10 | 75 (Shareholding through Thai Paraxylene Co., Ltd.) |
| Thaioil Solvent Company Limited 555/1 Energy Complex Building A, 11 th Floor, Vibhavadi Rangsit Road, Chatuchak, Chatuchak, Bangkok 10900, Thailand Tel : +66(0) -2299-0000, +66(0) -2797-2999 Fax : +66(0) -2797-2970 | 0105551116050 | Investment in solvent and petrochemical manufacturing and distributor business | 1,250,000,000 | Common | 125,000,000 | 10 | 100 |

| Company Name and Address | Registration Number | Business | Registered Capital (Baht) | Type of Shares | Number of Shares (Issued) | Value of Share (Baht per share) | Shareholding (%) |
|--|---|--|---------------------------|----------------|---------------------------|---------------------------------|--|
| TOP Solvent Company Limited 555/1 Energy Complex Building A, 11 th Floor, Vibhavadi Rangsit Road, Chatuchak, Chatuchak, Bangkok 10900, Thailand Tel : +66(0) -2299-0000, +66(0) -2797-2999 Fax : +66(0) -2797-2983 | 0105551116491 | Solvent and Chemical distributor | 1,200,000,000 | Common | 120,000,000 | 10 | 100 (Shareholding through Thaioil Solvent Co., Ltd.) |
| Sak Chaisidhi Company Limited 555/1 Energy Complex Building A, 11 th Floor, Vibhavadi Rangsit Road, Chatuchak, Chatuchak, Bangkok 10900, Thailand Tel : +66(0) -2299-0003, +66(0) -2797-2993 Fax : +66(0) -2797-2983 | 0105527011880 | Hydrocarbon solvent manufacturer and distributor | 180,000,000 | Common | 1,800,000 | 100 | 80.52 (Shareholding through TOP Solvent Co., Ltd.) |
| TOP Solvent (Vietnam) Limited Liability Company Go Dau Industrial Zones, Long Thanh District, Dong Nai Province, Vietnam Tel : +84-83827-9030-4 Fax : +84-83827-9035 | 472043000745 (Registered in Vietnam) | Solvent and Chemical distributor in Vietnam | 373,520,000,000 VND | Common | - | - | 100 (Shareholding through TOP Solvent Co., Ltd.) |
| PT. Tirta Surya Raya Synergy Building Lt. 12 unit 09 Jl. Jalur Sutera Barat No.17, Kel. Panunggangan Timur, Kec. Pinang, Kota Tangerang, Banten Province, Indonesia Tel : +62-21808-21308 Fax : +62-21808-21307 | 9120102163812 (Registered in Indonesia) | Solvent and Chemical distributor in Indonesia | 23,000,000,000 IDR | Common | 23,000 | 1,000,000 IDR per share | 67 (Shareholding through TOP Solvent Co., Ltd.) |

| Company Name and Address | Registration Number | Business | Registered Capital (Baht) | Type of Shares | Number of Shares (Issued) | Value of Share (Baht per share) | Shareholding (%) |
|--|---------------------|---|---------------------------|----------------|---------------------------|---------------------------------|---|
| Power Generation Business Thaioil Power Company Limited 555/1 Energy Complex Building A, 11 th Floor, Vibhavadi Rangsit Road, Chatuchak Chatuchak, Bangkok 10900, Thailand Tel : +66(0) -2299-0000 +66(0) -2797-2999 Fax : +66(0) -2797-2970 | 0105539103296 | Power and steam generator and distributor | 2,810,000,000 | Common | 281,000,000 | 10 | 73.99 |
| Global Power Synergy Public Company Limited 555/2 Energy Complex Building B, 5 th Floor, Vibhavadi Rangsit Road, Chatuchak Chatuchak, Bangkok 10900, Thailand Tel : +66(0) -2140-4600 Fax : +66(0) -2140-4601 | 0107557000411 | Operate power generation business, including invest and develop future projects in power business | 28,197,293,710 | Common | 2,819,729,367 | 10 | 8.91 and 20.78 (Shareholding through Thaioil Power Co., Ltd.) |
| TOP SPP Company Limited 555/1 Energy Complex Building A, 11 th Floor, Vibhavadi Rangsit Road, Chatuchak Chatuchak, Bangkok 10900, Thailand Tel : +66(0) -2299-0000, +66(0) -2797-2999 Fax : +66(0) -2797-2974 | 0105556198933 | Power and steam generator and distributor | 3,500,000,000 | Common | 350,000,000 | 10 | 100 |
| Transportation Business Thaioil Marine Company Limited 223/97 Country Complex Building A, 22 nd Floor, Sanphawut Road, Bangna, Bangkok 10260, Thailand Tel : +66(0) -2361-7500 Fax : +66(0) -2361-7498-9 | 0105541047578 | Provide marine transportation of petroleum and petrochemical products | 970,000,000 | Common | 97,000,000 | 10 | 100 |

| Company Name and Address | Registration Number | Business | Registered Capital (Baht) | Type of Shares | Number of Shares (Issued) | Value of Share (Baht per share) | Shareholding (%) |
|---|---|--|---------------------------|----------------|---------------------------|---------------------------------|---|
| Thaioil Marine International Private Limited 391A Orchard Road #12-01104, #12-05 & 12-10, Ngee Ann City Tower A, Singapore 238873 Tel : +65-6734-6540 Fax : +65-6734-3397, +65-6734-5801 | 201021606H (Registered in Singapore) | Investment in marine transportation of crude oil and petroleum products | 9,000,000 USD | Common | 9,000,000 | 1 USD per share | 100 (Shareholding through Thaioil Marine Co., Ltd.) |
| TOP-NYK MarineOne Private Limited 1 Harbourfront Place #13-01, Harbourfront Tower One, Singapore 098633 Tel : +65-6290-8405 Fax : +65-6293-2080 | 201104774G (Registered in Singapore) | Marine transportation of crude oil and petroleum products | 18,000,000 USD | Common | 18,000,000 | 1 USD per share | 50 (Shareholding through Thaioil Marine International Pte. Ltd.) |
| TOP Maritime Service Company Limited 223/97 Country Complex Building A, 22 nd Floor, Sanphawut Road, Bangna, Bangkok 10260, Thailand Tel : +66(0) -2361-7500 Fax : +66(0) -2361-7498-9 | 0115554017087 | Marine transportation services for crew and supplies | 520,000,000 | Common | 5,200,000 | 100 | 100 (Shareholding through Thaioil Marine Co., Ltd.) |
| T.I.M. Ship Management Company Limited 223/18-20 Country Complex Building A, 8 nd Floor, Sanphawut Road, Bangna, Bangkok 10260, Thailand Tel : +66(0) -2745-7711 Fax : +66(0) -2745-7713 | 0105551087343 | Ship management and international-standard fleet development services as well as crew development consultation (technical operation and marine transportation quality) | 3,000,000 | Common | 30,000 | 100 | 33.3 (Shareholding through Thaioil Marine Co., Ltd.) |

| Company Name and Address | Registration Number | Business | Registered Capital (Baht) | Type of Shares | Number of Shares (Issued) | Value of Share (Baht per share) | Shareholding (%) |
|--|---|---|---------------------------|----------------|---------------------------|---------------------------------|---|
| TOP-NTL Private Limited 6 Temasek Boulevard #32-03 Suntec Tower Four, Singapore 038986 Tel : +65-6361-0382 Fax : +65-6361-0377 | 201202478W (Registered in Singapore) | Trustee management | 20,000 SGD | Common | 20,000 | 1 SGD per share | 50 (Shareholding through Thailoil Marine Co., Ltd.) |
| TOP-NTL Shipping Trust 6 Temasek Boulevard #32-03 Suntec Tower Four, Singapore 038986 Tel : +65-6361-0382 Fax : +65-6361-0377 | 2012002 (Registered in Singapore) | Trust business primarily involved in managing and providing ship management services | 1,894,000 SGD | Common | 1,894,000 | 1 SGD per share | 50 (Shareholding through Thailoil Marine Co., Ltd.) |
| TOP Nautical Star Company Limited 88 Soi Bangna-Trad 30, Bangna-Trad Road, Bangna, Bangna, Bangkok, 10260, Thailand Tel : +66(0) -2331-0080-5 Fax : +66(0) -2331-0086 | 0105556123275 | Large vessels provider for storage and transportation of crude oil, feedstock, and petroleum products | 150,000,000 | Common | 1,500,000 | 100 | 35 (Shareholding through Thailoil Marine Co., Ltd.) 30 (Shareholding through TOP-NTL Shipping Trust) |
| Thai Petroleum Pipeline Company Limited 2/8 Moo 11, Lumlukka Road, Ladsawai, Lumlukka, Pathumthani 12150, Thailand Tel : +66(0) -2034-9199 Fax : +66(0) -2533-2687 | 0105534002696 | Pipeline transportation of petroleum products | 8,479,000,000 | Common | 84,790,000 | 100 | 9.19 |

| Company Name and Address | Registration Number | Business | Registered Capital (Baht) | Type of Shares | Number of Shares (Issued) | Value of Share (Baht per share) | Shareholding (%) |
|--|---------------------|---|---------------------------|----------------|---------------------------|---------------------------------|---|
| Other Business | | | | | | | |
| Thaioil Energy Services Company Limited 555/1 Energy Complex Building A, 11 th Floor, Vibhavadi Rangsit Road, Chatuchak, Chatuchak, Bangkok 10900, Thailand Tel : +66(0) -2299-0000, +66(0) -2797-2999 Fax : +66(0) -2797-2970 | 0105550078006 | Recruiting management service | 40,000,000 | Common | 4,000,000 | 10 | 100 |
| Thaioil Ethanol Company Limited 555/1 Energy Complex Building A, 11 th Floor, Vibhavadi Rangsit Road, Chatuchak Chatuchak, Bangkok 10900, Thailand Tel : +66(0) -2299-0000, +66(0) -2797-2999 Fax : +66(0) -2797-2970 | 0105551121754 | Investment in ethanol business and alternative energy | 1,450,000,000 | Common | 145,000,000 | 10 | 100 |
| Sapthip Company Limited 68 Soi Santipap, Sap Road, Sipraya, Bangrak, Bangkok 10500, Thailand Tel : +66(0) -2233-0444-5 Fax : +66(0) -2233-0441 | 0105539017543 | Cassava-based ethanol manufacturer and distributor | 800,000,000 | Common | 8,000,000 | 100 | 50 (Shareholding through Thaioil Ethanol Co., Ltd.) |
| Sapthip Green Energy Company Limited 49 Moo 6, Nikomlamnlai, Chaibadan Lopburi 15130, Thailand Tel : +66(0) -3646-2438 Fax : +66(0) -3846-2475 | 0165561000615 | Power from biogas, generator and distributor | 25,000,000 | Common | 2,500,000 | 10 | 50 (Shareholding through Sapthip) Co., Ltd.) |

| Company Name and Address | Registration Number | Business | Registered Capital (Baht) | Type of Shares | Number of Shares (issued) | Value of Share (Baht per share) | Shareholding (%) |
|---|---------------------|---|---------------------------|----------------|---------------------------|---------------------------------|---|
| Ubon Bio Ethanol Public Company Limited 333 Moo 9, Nadee, Navear, Ubonratchatani 34160, Thailand Tel : +66(0) -4525-2777 Fax : +66(0) -4525-2776 | 0345550000315 | Cassava-based and molasses-based ethanol manufacturer and distributor | 2,740,000,000 | Common | 2,740,000 | 1,000 | 21.28 (Shareholding through Thailoil Ethanol) Co., Ltd.) |
| PTT Digital Solutions Company Limited 555/1 Energy Complex Building A, 4 th - 5 th Floor, Vibhavadi Rangsit Road, Chatuchak, Chatuchak, Bangkok 10900, Thailand Tel : +66(0) -2140-2000 Fax : +66(0) -2140-2999 | 0105549076496 | IT and communication services | 150,000,000 | Common | 15,000,000 | 10 | 20 |
| PTT Energy Solutions Company Limited 888 Green Building, Mapchalood-Leamson Road, Huai Pong, Mueng Rayong, Rayong 21150, Thailand Tel : +66(0) -3897-8300 Fax : +66(0) -3897-8333 | 0105554075621 | Engineering technique consultation and other services | 150,000,000 | Common | 1,500,000 | 100 | 20 |
| Thailoil Treasury Center Company Limited 555/1 Energy Complex Building A, 11 th Floor, Vibhavadi Rangsit Road, Chatuchak, Chatuchak, Bangkok 10900, Thailand Tel : +66(0) -2299-0000, +66(0) -2797-2999 Fax : +66(0) -2797-2974 | 0105560167273 | The engaging in treasury center for Thailoil and Subsidiaries | 956,200,000 | Common | 46,939,000 | 10 | 100 |

| Company Name and Address | Registration Number | Business | Registered Capital (Baht) | Type of Shares | Number of Shares (Issued) | Value of Share (Baht per share) | Shareholding (%) |
|--|---|---|---------------------------|----------------|---------------------------|---------------------------------|---|
| TOP Ventures Company Limited 555/1 Energy Complex Building A, 11 th Floor, Vibhavadi Rangsit Road, Chatuchak, Chatuchak, Bangkok 10900, Thailand Tel : +66(0) -2299-0000, +66(0) -2797-2999 Fax : +66(0) -2797-2974 | 0105562147342 | Investments in Corporate Venture Capital and/or Startup Business | 35,000,000 | Common | 875,000 | 10 | 100 (Shareholding through Thaioil Treasury Center Co., Ltd.) |
| TOP Ventures Hong Kong Limited 18 th Floor, One Exchange Square 8 Connaught Place, Central, Hong Kong Tel : +852-2582-2912 Fax : +852-2912-2600 | 2860983 (Registered in Hong Kong) | Investments in Corporate Venture Capital and/or Startup Business | 1 HKD | Common | 1 | 1 HKD per share | 100 (Shareholding through Thaioil Treasury Center Co., Ltd.) |
| TOP Ventures America Limited Liability Company The Corporation Trust Company 1209 Orange Street, Wilmington, Delaware 19801 Tel : +1(888)-724-9870 | 7559091 (Registered in USA) | Investments in Corporate Venture Capital and/or Startup Business | 1 USD | Common | 1 | 1 USD per share | 100 (Shareholding through TOP Ventures Hong Kong Limited) |
| Sarn Palung Social Enterprise Company Limited 555/1 Energy Complex Building A, 10 th Floor, Vibhavadi Rangsit Road, Chatuchak, Chatuchak, Bangkok 10900, Thailand Tel : +66(0) -2537-2971 Fax : +66(0) -2537-2978 | 0105560151628 | Support execution of social enterprise of PTT Group | 10,000,000 | Common | 1,000,000 | 10 | 15 |

Reference

Securities Registrar

Thailand Securities Depository Company Limited (TSD)
The Stock Exchange of Thailand Building,
93 Ratchadaphisek Road, Dindaeng,
Bangkok 10400, Thailand
Tel : +66(0) -2009-9000,
+66(0) -2009-9999 (Call center)
Fax : +66 0) -2009-9991

Debenture Registrar and Principal Paying Agent

Thai Military Bank Public Company Limited
Securities Services and Fund Operations
3000 Head Office, Floor 5 A, Phahonyothin Road,
Chompon, Chatuchak, Bangkok 10900, Thailand
Tel : +66(0) -2299-1830
Fax : +66(0) -2242-3270

Bangkok Bank Public Company Limited

The Registrar and Debenture Holders' Representative
333 Head Office, 1st Floor, Trinity Building,
Silom Road, Silom, Bangrak, Bangkok 10500, Thailand
Tel : +66(0) -2230-1478, +66(0) -2230-2895
Fax : +66(0) -2230-1893

Auditor

PricewaterhouseCoopers ABAS Limited
179/74-80, 15th Floor, Bangkok City Tower,
1 South Sathorn Road, Bangkok 10120, Thailand
Tel : +66(0) -2844-1000
Fax : +66(0) -2286-2666

Other Services (Loss of Share Certificate, Change of Particulars in Securities Register and Other Services)

Counter Service

The Stock Exchange of Thailand Building, 1st Floor,
93 Ratchadaphisek Road, Dindaeng,
Bangkok 10400, Thailand
Tel : +66(0) -2009-9999 (Call center)

or

Office of Registration Services

Thailand Securities Depository Company Limited (TSD)
The Stock Exchange of Thailand Building,
93 Ratchadaphisek Road, Dindaeng,
Bangkok 10400, Thailand
Tel : +66(0) -2009-9000,
+66(0) -2009-9999 (Call center)
Fax : +66(0) -2009-9991

THAIOIL AND SUBSIDIARIES' BUSINESS STRUCTURE

Oil Refinery



Thai Oil Plc

Capacity:
275,000 barrels/day

Platformate
1.8 million tons/annum

Petrochemical & Lube Base Oil

100%



Thai Paraxylene Co., Ltd.

Aromatics
Capacity:
Paraxylene
527,000 tons/annum
Mixed Xylene
52,000 tons/annum
Benzene
259,000 tons/annum
Total
838,000 tons/annum

25% Mitsui & Co., Ltd.

75%

Labix Co., Ltd.

LAB Producer and Distributor
Capacity: 120,000 tons/annum

100% **Thaioil Solvent Co., Ltd.**

100%

TOP Solvent Co., Ltd.

Solvent Distributor in Thailand

80.5%

100%

67%

Sak Chaisidhi Co., Ltd.

Solvent Manufacturer
Capacity:
141,000 tons/annum

TOP Solvent (Vietnam) LLC.

Solvent and Chemical Distributor
in Vietnam

PT. Tirta Surya Raya (TSR)

Solvent and Chemical Distributor
in Indonesia

Thaioil is Thailand's largest refinery and supplier of petroleum products. Founded in 1961, we operate one of the most efficient refineries in Asia Pacific with the current capacity of 275,000 barrels per day.

Thaioil operates under the Operational Excellence principle, operating as an integrated group of businesses in oil refinery, petrochemicals and lube base oil with supporting businesses, e.g. power generation, solvents, marine and pipeline transportation, renewable energy generation, LAB: an intermediate in the production of surfactants, business in the area of International Business Center and Treasury Center, as well as recruitment services for Thaioil and Subsidiaries. Thaioil leads the Thai refinery industry through a well-planned and integrated production process, yielding optimum efficiency. Our product quality are high, rated in the top quartile of refineries in Asia Pacific at lower production costs, giving Thaioil a recognized competitive advantage.

Power Generation

74% 26% PTT Plc



Thaioil Power Co., Ltd.

Sells Electricity/Steam to Thaioil and Subsidiaries

Small Power Producer (SPP)
3-on-1 Combined Cycle
Capacity:
Electricity: 118 megawatts
Steam: 216 tons/hour

100% TOP SPP Co., Ltd.

2 Small Power Producer (SPP)
Capacity:
Electricity: 239 megawatts
Steam: 497 tons/hour

22.6% PTT Plc
22.7% PTT Global Chemical Plc
25% Free Float in SET

20.8%

Global Power Synergy Plc

Principal power plant of PTT Group
Capacity:
Electricity: 5,026 megawatts
Steam: 2,876 tons/hour
Industrial water: 7,372 cubic meters/hour
Chilled water: 15,400 refrigeration tons

Earning Stability

Transportation & Others

100%



Thaioil Marine Co., Ltd.

5 Oil & Chemical Tankers

Capacity: 22,800 deadweight tonnage

3 Crude Tankers VLCCs

Capacity: 881,050 deadweight tonnage

13 Crew & Utility Boats

Capacity: 120 deadweight tonnage each

2 Large Vessels for Crude, Feedstock & Product Storage and Transportation Services

Capacity: 200,000 deadweight tonnage

Ship Management Services

40.4% PTT Oil and Retail Business Plc
50.4% Others

9.2% Thai Petroleum Pipeline Co., Ltd.

Multi-product Pipeline
Capacity: 26,000 million litres/annum

100%



Thaioil Ethanol Co., Ltd.

50%

Sapthip Co., Ltd.

Cassava Based Ethanol
Capacity: 200,000 litres/day

57.4% 21.3%
Others — Bangkok Corporation Plc

21.3%

Ubong Bio Ethanol Plc

Cassava and Molasses Based Ethanol
Capacity: 400,000 litres/day

Thaioil Energy Services Co., Ltd.

Provides Recruitment
Service for Thaioil and Subsidiaries

40% PTT Plc
20% PTT Global Chemical Plc
20% IRPC Plc

PTT Energy Solutions Co., Ltd.

Provides engineering
technique consulting services
80% PTT Group

PTT Digital Solutions Co., Ltd.

IT and communication services
85% PTT Group

Sarn Palung Social Enterprise Co., Ltd.

Supports execution of
social enterprise of PTT Group

Thaioil Treasury Center Co., Ltd.

Increases financial efficiency of
Thaioil and Subsidiaries and
Investment in Corporate Venture
Capital (CVC) and Startup Business

Marketing/IT Support

REVENUE STRUCTURE

Thaioil's core earnings were derived from our oil refinery business. Other revenue contributors were the lube base oil refinery, petrochemical, power generation, marine transportation service, solvent, ethanol and other businesses.

(Million Baht)

| | | | For the year ended December 31 | | | | | |
|--|------------------------|--------|--------------------------------|------|--------------------|------|--------------------|------|
| | | | 2019 | | 2018 | | 2017 | |
| | | | | | (Reclassification) | | (Reclassification) | |
| Operator ⁽¹⁾ | Ownership Interest (%) | | Amount | % | Amount | % | Amount | % |
| A. Net Sales | | | | | | | | |
| 1. Oil refinery | TOP | - | 377,547 | 102 | 407,952 | 104 | 352,356 | 102 |
| 2. Lube base oil refinery | TLB | 100 | 18,243 | 5 | 20,959 | 5 | 18,662 | 5 |
| 3. Petrochemical | TPX | 100 | 52,198 | 14 | 66,701 | 17 | 57,881 | 17 |
| 4. Power generation | TP/TOP SPP | 74/100 | 11,770 | 4 | 11,734 | 3 | 10,929 | 4 |
| 5. Marine transportation services | TM | 100 | 660 | - | 621 | - | 801 | - |
| 6. Solvent | TOS | 100 | 9,102 | 3 | 9,992 | 3 | 9,182 | 3 |
| 7. Ethanol | TET | 100 | 1,473 | - | 1,477 | - | 1,620 | - |
| 8. Other | TES/TTC | 100 | 4,925 | 1 | 1,925 | - | 985 | - |
| Less: Eliminations | | | (110,962) | (30) | (129,195) | (33) | (112,501) | (33) |
| Total | | | 364,326 | 99 | 392,166 | 99 | 339,915 | 98 |
| B. Net Derivative Gain on Hedging ⁽²⁾ | | | | | | | | |
| 1. Oil refinery | TOP | - | - | - | - | - | - | - |
| 2. Petrochemical | TPX | 100 | 569 | - | - | - | - | - |
| Total | | | 569 | - | - | - | - | - |
| C. Net Foreign Exchange Gain | | | | | | | | |
| 1. Oil refinery | TOP | - | 1,847 | - | 430 | - | 2,882 | 1 |
| 2. Lube base oil refinery | TLB | 100 | 1 | - | 14 | - | - | - |
| 3. Petrochemical | TPX | 100 | 22 | - | 159 | - | 333 | - |
| 4. Power generation | TP/TOP SPP | 74/100 | 4 | - | 3 | - | 1 | - |
| 5. Marine transportation services | TM | 100 | - | - | 10 | - | - | - |
| 6. Solvent | TOS | 100 | - | - | 11 | - | - | - |
| 7. Ethanol | TET | 100 | 2 | - | - | - | 1 | - |
| 8. Other | TES/TTC | 100 | 8 | - | - | - | - | - |
| Total | | | 1,884 | - | 627 | - | 3,217 | 1 |

(Million Baht)

| | | | For the year ended December 31 | | | | | |
|-----------------------------------|------------------------|--------|--------------------------------|-----|----------------------------|-----|----------------------------|-----|
| | | | 2019 | | 2018 (Reclassification) | | 2017 (Reclassification) | |
| Operator ⁽¹⁾ | Ownership Interest (%) | | Amount | % | Amount | % | Amount | % |
| D. Other Revenues ⁽³⁾ | | | | | | | | |
| 1. Oil refinery | TOP | - | 3,467 | 1 | 3,705 | 1 | 3,272 | 1 |
| 2. Lube base oil refinery | TLB | 100 | 83 | - | 87 | - | 93 | - |
| 3. Petrochemical | TPX | 100 | 316 | - | 299 | - | 235 | - |
| 4. Power generation | TP/TOP SPP | 74/100 | 31 | - | 26 | - | 21 | - |
| 5. Marine transportation services | TM | 100 | 26 | - | 45 | - | 32 | - |
| 6. Solvent | TOS | 100 | 19 | - | 16 | - | 14 | - |
| 7. Ethanol | TET | 100 | 3 | - | 6 | - | 6 | - |
| 8. Other | TES/TTC | 100 | 1 | - | 2 | - | 1 | - |
| Less: Eliminations | | | (2,369) | - | (2,467) | - | (2,484) | - |
| Total | | | 1,577 | 1 | 1,719 | 1 | 1,190 | 1 |
| Total revenues (A-D) | | | 368,356 | 100 | 394,512 | 100 | 344,322 | 100 |

Remarks:

⁽¹⁾ TOP is Thai Oil Plc

TLB is Thai Lube Base Plc

TPX is Thai Paraxylene Co., Ltd. having respective interests in Labix Co., Ltd.

TP is Thailoil Power Co., Ltd.

TOP SPP is TOP SPP Co., Ltd.

TM is Thailoil Marine Co., Ltd. having respective interests in Thailoil Marine International Pte. Ltd. and TOP Maritime Service Co., Ltd.

TOS is Thailoil Solvent Co., Ltd. having respective interests in TOP Solvent Co., Ltd., Sak Chaisidhi Co., Ltd., TOP Solvent (Vietnam) LLC. and PT. Tirta Surya Raya

TET is Thailoil Ethanol Co., Ltd. having respective interests in Sapthip Co., Ltd.

TES is Thailoil Energy Services Co., Ltd.

TTC is Thailoil Treasury Center Co., Ltd.

⁽²⁾ Petrochemical have net derivative gain on hedging in 2019 but oil refinery and petrochemical have net derivative loss on hedging in 2017 and 2018.

⁽³⁾ Comprises received interests, export tax subsidy, revenues from services provided to subsidiary companies, land lease, single buoy mooring service fee, oil storage tank lease, gain on disposal of investments, reversal of impairment loss on property, plant and equipment, etc.

MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL POSITION AND OPERATING RESULTS

Operating Results-Consolidated Financial Results

| | | 2019 | 2018 | +/(−) |
|--|--------------|---------------|---------------|----------------|
| Gross Integrated Margin (GIM) | | | | |
| <u>excluding</u> Stock Gain/(Loss) ⁽¹⁾ | USD/barrel | 4.7 | 6.9 | (2.2) |
| Gross Integrated Margin (GIM) | | | | |
| <u>including</u> Stock Gain/(Loss) ⁽¹⁾ | " | 5.2 | 6.6 | (1.4) |
| Sales revenue ⁽²⁾ | Million Baht | 362,179 | 389,042 | (26,863) |
| Hedging Gain/(Loss) | " | 359 | (821) | 1,180 |
| EBITDA | " | 13,833 | 20,239 | (6,406) |
| Foreign Exchange Gain/(Loss) ⁽³⁾ | " | 1,775 | 627 | 1,148 |
| Finance Costs | " | (3,307) | (3,942) | 635 |
| Reversal of Income Tax/(Expense) | " | (1,239) | (1,983) | 744 |
| Net Profit/(Loss) ⁽⁴⁾ | " | 6,277 | 10,149 | (3,872) |
| Basic Earnings/(Loss) per Share | Baht | 3.08 | 4.97 | (1.89) |
| Stock Gain/(Loss) | Million Baht | 1,581 | (1,315) | 2,896 |
| Reversal/(Write-Down) on | | | | |
| Crude and Petroleum Product Inventory ⁽⁵⁾ | " | 659 | (449) | 1,108 |

Remark

⁽¹⁾ Gross Integrated Margin is the integrated gross margin among Thailoil Refinery, Thai Lube Base Plc, Thai Paraxylene Co., Ltd. and Labix Co., Ltd.

⁽²⁾ The comparative figures have been adjusted due to reclassification.

⁽³⁾ Including foreign exchange gain/(loss) on foreign currency assets and liabilities in year 2019 and 2018 of THB 1,607 million and THB 890 million, respectively.

⁽⁴⁾ Including dividends received from Thai Petroleum Pipeline Co., Ltd. of THB 160 million for 2019 and THB 154 million for 2018.

⁽⁵⁾ Including reversal/(write-down) of allowance for decline in value of crude inventories adjusted to net realisable value and reversal/(write-down) of petroleum product at cost, and excluding reversal/(write-down) of allowance for decline in value of product inventories adjusted to net realisable value.

For the year 2019, Thailoil and Subsidiaries maintained elevated level of outputs. Thailoil refinery had a 107% in utilization rate. The production rate of aromatics business, Linear Alkyl Benzene (LAB) business and lube base oil business, were 70%, 113%, and 83%, respectively. For the operating results comparing the year 2019 with 2018, Thailoil and Subsidiaries reported sales revenue of THB 362,179 million, a dip of THB 26,863 million, primarily

from lower product sales volume from major turnaround and lower product selling prices tracking lower crude oil price. Besides, weakened petroleum product spreads, aromatics spreads (both paraxylene and benzene spreads over ULG95), and lube base oil spreads over fuel oil from surplus supply led to lower GIM excluding stock gain/(loss) by 2.2 USD per barrel to 4.7 USD per barrel. Nevertheless, Thailoil and Subsidiaries had stock

gain of THB 1,581 million from higher crude oil price. Thus, Thailoil and Subsidiaries reported EBITDA of THB 13,833 million, a decrease of THB 6,406 million, which included major turnaround expenses of THB 1,066 million and a net derivative gain on hedging instruments of THB 359 million. Thailoil and Subsidiaries had net foreign exchange gain of THB 1,775 million, which increased by THB 1,148 million from Thai Baht appreciation, and finance costs of THB 3,307 million, which lowered by THB 635 million because there was a capitalization of borrowing costs into a part of asset costs while there were higher finance costs in 2018 because of debenture repurchase transactions. Additionally, Thailoil and Subsidiaries recorded severance expense of THB 384 million due to the recognition of provision for employee benefits in accordance with the new Labour Protection Act, which stipulated additional compensation rates for employees who have worked for 20 years or more to have the right to receive compensation not less than the final 400 days of wage from the original of 300 days. Therefore, in 2019, Thailoil and Subsidiaries reported net profit of THB 6,277 million, decreased by THB 3,872 million.

In October 2019, Thailoil Treasury Center Co., Ltd. (TTC) issued a fully guaranteed senior unsecured debentures of USD 565 million with the tenor of 30 years to foreign institutional investors for capital expenditures, general corporate purposes and accommodating future growth of Thailoil and Subsidiaries.

Results by Company for the year 2019 compared to 2018

Thailoil Refinery (Thailoil) had a 107% throughput while had almost the same level of total product sales volume as last year. It had petroleum product sales proportion of 88% for domestic, 9% for Indochina, and the rest 3% for export. Thailoil had sales revenue of THB 375,401 million, dropped by THB 29,428 million following lower average product selling prices. Thailoil reported Gross Refining

Margin (GRM) excluding stock gain/(loss) of 3.1 USD per barrel, significantly dropped by 1.6 USD per barrel, mainly because of the reductions in product spreads. However, Thailoil had stock gain of 0.5 USD per barrel or THB 1,581 million compared with stock loss of THB 1,315 million in 2018. Moreover, there was the reversal on crude and petroleum product inventory of THB 659 million, compared with the write-down on crude and petroleum product inventory of THB 449 million from last year. It also had the dip in net derivative loss on hedging instruments of THB 26 million to THB 211 million. Offsetting with major turnaround expenses, Thailoil had EBITDA of THB 5,902 million, dropped by THB 4,148 million. In addition, Thailoil had net foreign exchange gain of THB 1,847 million, lifted by THB 1,417 million mainly from unrealised net foreign exchange gain on foreign currency assets and liabilities. Besides, there was a drop in finance costs of THB 634 million owing to capitalization on some finance costs to assets costs and finance costs from repurchase of debentures in 2018. Nevertheless, in 2019, Thailoil recorded higher expenses by THB 305 million owing to the provision for employee benefits according to the new Labour Protection Act. Offsetting with depreciation and income tax expense, Thailoil earned net profit of THB 2,161 million, decreased by THB 1,822 million (including dividend income in 2019, it had net profit of THB 4,655 million).

Thai Paraxylene Co., Ltd. (TPX) had aromatics utilization rate of 70%, decreased by 19% due to its major turnaround from mid-June to late July 2019. Therefore, TPX reported sales revenue of THB 35,598 million, dropped by THB 13,145 million mainly because of lower sales volume and lower selling prices. Besides, TPX booked Product-to-Feed margin of 81 USD per ton, lowered by 40 USD per ton because of a decline in aromatics spreads over ULG95 due to excess supply from the new paraxylene plant. Nevertheless, TPX

reported net derivative gain on hedging instruments of THB 566 million while it booked net derivative loss of THB 546 million in 2018. Offsetting with major turnaround expenses, TPX then reported EBITDA of THB 2,692 million, reduced by THB 2,085 million. Furthermore, TPX had net foreign exchange loss of THB 2 million, compared with the net foreign exchange gain of THB 93 million in 2018. Offsetting with depreciation, finance costs, and income tax expense, TPX posted net profit of THB 1,009 million, decreased by THB 1,655 million from 2018.

Labix Co., Ltd. (Labix) had LAB production rate of 113%, increase by 9% and had higher LAB sales volume. However, it had lower LAB price tracking lower feedstock prices. Consequently, Labix reported sales revenue of THB 17,473 million, lower by THB 1,643 million. However, the increase of gross margin and other income resulted in Labix to reported EBITDA of THB 772 million, increased by THB 63 million. Labix also had foreign exchange gain of THB 24 million, decreased by THB 42 million, together with offsetting depreciation and finance costs, Labix reported net loss of THB 131 million, compared with net loss of THB 178 million in 2018.

For the year 2019, aromatics group had consolidated sales revenue of THB 52,198 million, consolidated EBITDA of THB 3,464 million and consolidated net profit of THB 911 million.

Thai Lube Base Plc (TLB) had sales revenue of THB 18,243 million, decreased by THB 2,716 million mainly because of both lower average product selling price and total product sales volume. However, TLB had Product-to-Feed margin of 89 USD per ton, boosted by 5 USD per ton mainly to better bitumen spread over fuel oil because of a growing in regional demand and lower fuel oil price. Therefore, TLB had EBITDA of THB 1,443 million, reduced by THB 4 million. Offsetting with depreciation and income tax expense, TLB posted net profit of THB 1,067 million, dropped by THB 12 million from last year.

Thaioil Power Co., Ltd. (TP) reported sales revenue of THB 4,391 million, a decrease of THB 18 million. This was because of a decline in sales volume from the major turnaround of Thaioil and Subsidiaries and an increase in natural gas price (main feedstock) leading TP to report EBITDA of THB 681 million, dropped by THB 85 million. Offsetting with depreciation, increases in finance costs and income tax expense, TP reported net profit, excluding share of profit from the investment in Global Power Synergy Plc (GPSC), of THB 253 million, which dropped by THB 150 million from previous year.

TOP SPP Co., Ltd. (TOP SPP) had sales revenue of THB 7,379 million, surged by THB 54 million due to higher average selling prices of electricity and steam following higher natural gas price. Nevertheless, sales volume declined from the major turnaround of Thaioil and Subsidiaries and TOP SPP's maintenance shutdown. Moreover, the hike in natural gas price (main feedstock) and maintenance costs caused TOP SPP to report EBITDA of THB 1,723 million, a decrease of THB 163 million. Offsetting with depreciation, finance costs and income tax expense, TOP SPP posted net profit of THB 865 million, decreased by THB 204 million from previous year.

Besides, Thaioil and Subsidiaries recognized, without non-controlling interests, share of profit from the investment in GPSC of THB 986 million, which increased by THB 170 million. Thaioil and Subsidiaries, however, recognized net profit from power generation business of THB 2,036 million, reduced by THB 147 million from last year.

Thaioil Solvent Co., Ltd. (TOS) had a 118% solvent utilization rate and had a rise in solvent sales volume by approximately 8,000 tons. However, lower average solvent selling price per unit tracking crude oil price led TOS to record sales revenue of THB 9,102 million, decreased by THB 890 million, and to have EBITDA of THB 430 million, reduced by THB 7 million. In

addition, TOS had net foreign exchange loss of THB 106 million mainly because of the adjustment to other components of equity relating to short-term loan repayment from TOP Solvent (Vietnam) LLC. of THB 82 million compared with net foreign exchange gain of THB 11 million in prior year. Offsetting with depreciation, finance costs, income tax expense, and non-controlling interests, TOS posted net profit of THB 25 million, dipped by THB 98 million from last year.

Thaioil Marine Co., Ltd. (TM) recorded services revenue of THB 660 million (include revenue from TOP Maritime Service Co., Ltd., 100% owned by TM) rose by THB 39 million, from the acquisition of 1 additional vessel started operating since January 2019. However, the increase in services cost and vessel operating expenses, partly due to dry-docking of some TM fleets, caused TM to have a reduction in EBITDA of THB 10 million to THB 68 million. Additionally, TM recorded a drop in share of profit by THB 38 million from TOP-NYK MarineOne Pte. Ltd. and reported lower shares of profits from the investments in TOP-NTL Pte. Ltd., TOP-NTL Shipping Trust, TOP Nautical

Star Co., Ltd., and T.I.M. Ship Management Co., Ltd. total by THB 51 million, combined with the increase in recognized loss from sales of asset on TOP Maritime Service Co., Ltd. by THB 38 million. Offsetting with depreciation, finance costs, and income tax expense, TM recorded consolidated net loss of THB 216 million, an increase in loss by THB 172 million from previous year.

Thaioil Ethanol Co., Ltd. (TET) had consolidated sales revenue of THB 1,473 million, reduced by THB 4 million by the reason of lower ethanol selling price since the beginning of 2019. However, TET presented higher gross profit margin from using alternative feedstock, together with lower expenses from less maintenance shutdown days. TET consequently reported EBITDA of THB 160 million, rose by THB 17 million. However, TET had share of loss of by THB 9 million from the investment in Ubon Bio Ethanol Plc, from the pressure of low ethanol selling price, compared with share of profit of THB 14 million in 2018. Therefore, TET posted net loss of THB 10 million, compared with net profit of THB 4 million from last year.

Analysis of Consolidated Financial Position

| Financial Position (Million Baht) | Dec 31, 2019 | Dec 31, 2018 | +/(−) |
|-----------------------------------|--------------|--------------|---------|
| Total Assets | 283,445 | 268,613 | 14,832 |
| Total Liabilities | 159,521 | 142,141 | 17,380 |
| Total Equity | 123,924 | 126,472 | (2,548) |

Total Assets

As of December 31, 2019, Thaioil and Subsidiaries had total assets of THB 283,445 million, increased by THB 14,832 million or 5.5% from December 31, 2018 due to cash, cash equivalents and short-term investments dipped by THB 30,325 million because of due THB-denominated debenture redemption, finance costs paid, dividends paid, and project investments as

planned. In addition, trade accounts receivable reduced by THB 1,894 million tracking lower average product sales volume in December 2019. However, inventory increased by THB 1,554 million following an increase in average crude oil price in December 2019. Furthermore, non-current assets climbed by THB 44,899 million because property, plant, and equipment had a net increase of THB 26,630 million mainly from

several project investments according to a business plan and increase in the investment in associates by THB 18,126 million due mainly to purchasing of newly-issued ordinary shares in proportion of GPSC's shareholding.

Total Liabilities

As of December 31, 2019, Thailoil and Subsidiaries had total liabilities of THB 159,521 million, increased by THB 17,380 million or 12.2% from December 31, 2018 due to an increase in trade accounts payable of THB 3,171 million tracking higher crude oil price and crude purchase volume in December 2019 than December 2018. In addition, trade accounts payable increased by THB 5,234 million mainly from accounts payable of Clean Fuel Project (CFP) construction. However, excise duty payables reduced by THB 3,397 million due to the reduction of excise duty tax. Besides, income tax payable dropped by THB 334 million following a decrease in net profit. Furthermore, long-term borrowings and debentures (including current portions) increased by THB 11,955 million mainly because TTC issued debentures with the tenor of 30 years to foreign institutional investors for the total amount of USD 565 million in October 2019. These debentures was fully guaranteed by Thailoil. In addition, TP had THB-denominated borrowings of THB 3,999 million from PTT Plc for purchasing of newly-issued ordinary shares of GPSC in October 2019. However, USD-denominated debentures of Thailoil and TTC reduced by THB 888 million and THB 3,334 million, respectively owing to THB appreciation from the end of 2018 and Thailoil repaid its due THB-denominated debenture of THB 3,000 million in March 2019. Nevertheless, Labix (shares indirectly held by TPX) and TOP SPP repaid their due THB-denominated borrowings of THB 540 million and THB 295 million, respectively.

Total Equity

As of December 31, 2019, Thailoil and Subsidiaries had total equity of THB 123,924 million, decreased by THB 2,548 million or 2.0% from December 31, 2018. This resulted from total comprehensive income for the year 2019 of THB 6,545 million, together with non-controlling interests from a merger and acquisition activity of THB 13 million, deducted by dividends paid from Thailoil and Subsidiaries of THB 4,626 million and deficit from the change in the net assets in an associate of THB 4,481 million.

Analysis of Cash Flow and Financial Ratios

As of December 31, 2019, Thailoil and Subsidiaries had cash flows provided by operating activities of THB 13,087 million from net profit for the year 2019. In addition, Thailoil and Subsidiaries had cash flows provided by investing activities of THB 23,343 million as a consequence of net disposal of short-term investments of THB 72,285 million. However, there were purchases of property, plant, and equipment of THB 27,531 million which Thailoil spent THB 26,017 million in main projects such as Thailoil Sriracha Buildings Project, TOP Crude Oil Tank Project, Jetty Expansion Project, and Clean Fuel Project. The rest of THB 1,514 million was used by subsidiaries for various purposes such as the purchase of absorbent for aromatics production units which was scheduled for a maintenance shutdown. Besides, cash payment from acquisition of investment in an associate of THB 21,972 million mainly came from payment of Thailoil and Subsidiaries for capital raising plan of GPSC.

In addition, cash flows provided by financing activities were THB 8,129 million. These were mainly attributable to net proceeds from long-term borrowings of THB 2,845 million and debenture issuance of THB 13,982 million. However, there were finance costs paid and dividends paid of THB 3,257 million and THB 4,626 million, respectively, also with net repayment of short-term borrowings was THB 816 million.

According to the mentioned cash flows activities, Thaioil and Subsidiaries reported cash and cash equivalents increased by THB 44,560 million from December 31, 2018. Furthermore, Thaioil and Subsidiaries recorded loss on effect of exchange rate changes of THB 3,447 million. Hence, as of December 31, 2019, Thaioil and Subsidiaries

had cash and cash equivalents of THB 74,854 million, including with deposits at a financial institution used as collateral and short-term investments of THB 325 million and THB 1,757 million, respectively, Therefore, Thaioil and Subsidiaries had cash, cash equivalents, and short-term investments of THB 76,937 million.

Financial Ratios

| | | 2019 | 2018 | +/(−) |
|--|-------|------|------|-------|
| Profitability Ratios | | | | |
| Quality of Earnings ratio | % | 4 | 5 | (1) |
| Gross Profit Margin ratio | " | 4 | 6 | (2) |
| Net Profit Margin ratio | " | 2 | 3 | (1) |
| Liquidity Ratios | | | | |
| Current ratio | times | 3.5 | 4.3 | (0.8) |
| Quick ratio | " | 2.6 | 3.5 | (0.9) |
| Financial Policy Ratios | | | | |
| Total Liabilities/Total Equity | times | 1.3 | 1.1 | 0.2 |
| Net Debt/Equity | " | 0.3 | - | 0.3 |
| Long-term loan/Total Equity | " | 0.9 | 0.8 | 0.1 |
| Interest Coverage ratio ⁽¹⁾ | " | 4.2 | 5.1 | (0.9) |
| Long-term loan/Total Capitalization | % | 48 | 45 | 3 |

Financial Ratios Calculation

| | |
|---|---|
| Quality of Earnings ratio (%) | = EBITDA/Sales Revenue |
| Gross Profit Margin ratio (%) | = Gross Profit ⁽²⁾ /Sales Revenue |
| Net Profit Margin ratio (%) | = Net Profit for the period/Total Revenue |
| Current ratio (times) | = Current Assets/Current Liabilities |
| Quick ratio (times) | = (Cash and Cash equivalent + Short-term Investments + Accounts Receivable)/Current Liabilities |
| Total Liabilities/Total Equity (times) | = Total Liabilities/Total Equity |
| Net Debt/Equity (times) | = Net Debt/Total Equity |
| Long-term loan/Total Equity (times) | = Long-term loan/Total Equity |
| Long-term loan | = Long-term borrowings from financial institutions + Debentures (includes current portion) |
| Interest Coverage ratio (times) | = EBITDA/Interest Expenses (Finance Costs) ⁽³⁾ |
| Long-term loan/Total Capitalization (%) | = Long-term loan/Total Capitalization |
| Total Capitalization | = Long-term loan + Total Equity |
| Net Debt | = Interest bearing debt - Cash and Cash Equivalent - Short-term Investments |

Remark

⁽¹⁾ Including capitalization adjustment of borrowing costs to asset costs since January 1, 2019.

⁽²⁾ Excluding depreciation and amortization.

⁽³⁾ Including finance costs that Thaioil Treasury Center Co., Ltd. paid to bondholders.

CONNECTED TRANSACTIONS

For Fiscal Year 2019, Thairoil and/or Subsidiaries entered into significant business transactions with subsidiaries and related parties with common major shareholders and/or directors, as seen in the notes to its financial statements. Connected transactions were based on market prices or, in the absence of reference market prices, the prices agreed in previous contracts. The details of the relationships with these companies are as follows:

| Company | Relationship with Thairoil as of December 31, 2019 |
|--|--|
| PTT Plc (PTT) | >> Major shareholder, with 47.53% of Thairoil's shares |
| Thai Paraxylene Co., Ltd. (TPX) | >> Wholly owned by Thairoil >> Common director: Mr. Wirat Uanarumit >> Thairoil executives on TPX's Board: Mr. Bandhit Thamprajamchit and Mr. Saranyu Limwongse |
| Thai Lube Base Plc (TLB) | >> Wholly owned by Thairoil >> Common director: Mr. Wirat Uanarumit >> Thairoil executives on TLB's Board: Mr. Bandhit Thamprajamchit, Mr. Chatapong Wungtanagorn, Ms. Rungtip Maneesarachun and Mr. Saranyu Limwongse |
| Thairoil Power Co., Ltd. (TP) | >> 26.01% owned by PTT Plc >> 73.99% owned by Thairoil >> Common director: Mr. Wirat Uanarumit >> Thairoil executives on TP's Board: Mr. Bandhit Thamprajamchit, Mr. Jeerawat Pattanasomsit, Mr. Viroj Meenaphant and Mr. Udom Wongsirinopphakhun |
| TOP SPP Co., Ltd. (TOP SPP) | >> Wholly owned by Thairoil >> Common director: Mr. Wirat Uanarumit >> Thairoil executives on TOP SPP's Board: Mr. Nikom Kongnok and Mr. Udom Wongsirinopphakhun |
| TOP Solvent Co., Ltd. (TS) | >> Wholly owned by Thairoil Solvent Co., Ltd. >> Thairoil executives on TS's Board: Mr. Chatapong Wungtanagorn, Mr. Pongpun Amornvivat, Mr. Viroj Meenaphant, Ms. Rungtip Maneesarachun and Ms. Acharee Tiyaabhorn |

| Company | Relationship with Thailoil as of December 31, 2019 |
|--|--|
| Sak Chaisidhi Co., Ltd. (SAKC) | <ul style="list-style-type: none"> >> 80.52% owned by TOP Solvent Co., Ltd. >> Thailoil executives on SAKC's Board: Mr. Jeerawat Pattanasomsit, Mr. Chatapong Wungtanagorn, Mr. Pongpun Amornvivat, Mr. Surachai Saengsamran, Mr. Nikom Kongnok and Ms. Acharee Tiyaabhorn |
| TOP Solvent (Vietnam) LLC. (TSV) | <ul style="list-style-type: none"> >> Wholly owned by TOP Solvent Co., Ltd. >> Thailoil executives on TSV's Board: Ms. Rungtip Maneesarachun, Ms. Sudarat Orrattanasakul and Ms. Acharee Tiyaabhorn |
| Sapthip Co., Ltd. (SAP) | <ul style="list-style-type: none"> >> 50% owned by Thailoil Ethanol Co., Ltd. >> Thailoil executives on SAP's Board: Mr. Bandhit Thamprajamchit, Mr. Pongpun Amornvivat, Ms. Pattaralada Sa-NGasang and Ms. Torsang Chaipravat |
| TOP Maritime Service Co., Ltd. (TMS) | <ul style="list-style-type: none"> >> Wholly owned by Thailoil Marine Co., Ltd. >> Thailoil executives on TMS's Board: Ms. Pattaralada Sa-NGasang, Mr. Pongpun Amornvivat, Mr. Viroj Meenaphant and Mr. Nitas Krongvanitchayakul |
| Labix Co., Ltd. (Labix) | <ul style="list-style-type: none"> >> 75% owned by Thai Paraxylene Co., Ltd. >> Common director: Mr. Wirat Uanarumit >> Thailoil executives on Labix's Board: Ms. Pattaralada Sa-NGasang, Mr. Saranyu Limwongse and Ms. Duangporn Teerapabpaisit |
| Thai Petroleum Pipeline Co., Ltd. (THAPPLINE) | <ul style="list-style-type: none"> >> 40.4% owned by PTT Oil and Retail Business Plc >> 9.19% owned by Thailoil >> Thailoil executives on THAPPLINE's Board: Mr. Pongpun Amornvivat |
| PTT Digital Solutions Co., Ltd. (PTT Digital) | <ul style="list-style-type: none"> >> 20% owned by PTT Plc >> 20% owned by Thailoil >> Thailoil executives on PTT Digital's Board: Mr. Pongpun Amornvivat |
| PTT Oil and Retail Business Plc (PTTOR) | <ul style="list-style-type: none"> >> Wholly owned by PTT Plc >> Common director: Mr. Auttapol Rerkpiboon |
| PTT International Trading Pte. Ltd. (PTTT) | <ul style="list-style-type: none"> >> Wholly owned by PTT Plc |
| PTT Exploration and Production Plc (PTTEP) | <ul style="list-style-type: none"> >> 65.29% owned by PTT Plc |

| Company | Relationship with Thairoil as of December 31, 2019 |
|---------------------------------|--|
| PTT Global Chemical Plc (GC) | >> 47.68% owned by PTT Plc |
| IRPC Plc (IRPC) | >> 48.05% owned by PTT Plc |
| PTT Phenol Co., Ltd. | >> Wholly owned by PTT Global Chemical Plc |
| Global Green Chemical Plc (GGC) | >> 72.29% owned by PTT Global Chemical Plc |

Connected Transactions between Thairoil and/or Subsidiaries with Major Shareholders

Connected Transactions between Thairoil and PTT Plc

| Company | Transactions | Value in 2019 (Million Baht) |
|---------------|--|---------------------------------|
| PTT Plc (PTT) | <p>>> Revenue from sale of oil products: Thairoil entered into a Product Offtake and Crude Supply Agreement (POCSA) with PTT, under which both parties agreed on the sale and purchase of petroleum products at market prices and agreed to follow certain procedures to reach an agreed volume as well as other terms and conditions stipulated in the contract.</p> <p>On May 10, 2018, PTT entered into deed of novation to transfer partial rights, duties, and responsibilities to PTT Oil and Retail Business Plc effective from July 1, 2018.</p> | 1,929 |
| | <p>>> Expenses on the purchase of crude oil, petroleum products and natural gas: Thairoil entered into a POCSA with PTT. Both parties agreed on the sale and purchase of crude oil and petroleum products at market prices and agreed to follow certain procedures to reach an agreed volume as well as other terms and conditions stipulated in the contract.</p> | 116,149 |
| | <p>>> Thairoil entered into a 10-year (2014-2023) and 15-year (2007-2022) agreements with PTT for the supply of natural gas for the refinery at an agreed volume based on market prices, considered normal business practice.</p> | |

Connected Transactions between Subsidiaries and PTT Plc

| Company | Transactions | Value in 2019 (Million Baht) |
|------------------------------|--|---------------------------------|
| Thai Lube Base Plc (TLB) | >> TLB entered into a natural gas supply contract of nine years and nine months (2017-2026) with PTT for an agreed volume based on market prices, considered normal business practice. | 495 |
| Thaioil Power Co., Ltd. (TP) | >> TP entered into a 25-year natural gas sale and purchase agreement (1998-2022) with PTT at an agreed volume based on market prices, considered normal business practice. | 2,717 |
| TOP SPP Co., Ltd. (TOP SPP) | >> TOP SPP entered into a 25-year natural gas sale and purchase agreement (2016-2041) with PTT at an agreed volume based on market prices, considered normal business practice. | 4,661 |
| Labix Co., Ltd. (Labix) | >> Labix entered into a 10-year natural gas sale and purchase agreement (2015-2025) with PTT at an agreed volume based on market prices, considered normal business practice. | 673 |

Connected Transactions between Thailoil and Subsidiaries (Less than 100% Shareholding) or Other Related Companies

| Company | Transactions | Value in 2019 (Million Baht) |
|--|---|---------------------------------|
| Thailoil Power Co., Ltd. (TP) | >> Thailoil entered into a 24-year contract, starting on April 1, 1998, with TP to provide maintenance and other supporting services as well as supply of feedstock, parts, and reserved fuels. The service charge is based on cost-plus pricing, considered normal business practice. | 851 |
| | >> Thailoil entered into a 24-year infrastructure sharing contract with TP, starting April 1, 1998. TP agreed to pay for the consumption at 2% of its monthly revenue. | |
| | >> Thailoil entered into a 25-year contract (1998-2022) with TP for the supply of power and steam at an agreed volume based on market prices. | 1,730 |
| PTT Oil and Retail Business Plc (PTTOR) | >> Revenue from sale of oil products: Thailoil entered into a deed of novation under POCSA, the agreement signed with PTT and PTTOR. And PTTOR agreed on the sale and purchase of petroleum products at market prices and agreed to follow certain procedures to reach an agreed volume as well as other terms and conditions stipulated in the contract. | 164,543 |
| | >> Expenses on occasional purchase of oil products from PTTOR, considered normal business practice. | 259 |
| Thai Petroleum Pipeline Co., Ltd. (THAPPLINE) | >> Revenue from THAPPLINE's dividends | 160 |
| PTT Digital Solutions Co., Ltd. (PTT Digital) | >> Expenses for ICT services as agreed in a two-year contract (2019-2020) | 229 |
| PTT Global Chemical Plc (GC) | >> Expenses on occasional purchase of oil products from GC, considered normal business practice. | 484 |

| Company | Transactions | Value in 2019 (Million Baht) |
|--|---|---------------------------------|
| Global Green Chemicals Plc (GGC) | >> Expenses on occasional purchase of oil products from GGC, considered normal business practice. | 1,225 |
| PTT International Trading Pte. Ltd. (PTTT) | >> Revenue from occasional sale of oil products to PTTT, considered normal business practice. | 325 |
| | >> Expenses on occasional purchase of oil products from PTTT, considered normal business practice. | 11,133 |
| IRPC Plc (IRPC) | >> Expenses on crude oil tank service as indicated in a contract with IRPC. The agreed service charge was stipulated in the two-year contract, which ended in 2019. | 177 |
| | >> Purchase and sale of crude oil for legal reserve. | 2,240 |

Connected Transactions between Subsidiaries and Related Companies

| Company | Related Company | Transactions | Value in 2019 (Million Baht) |
|---------------------------------|--|---|---------------------------------|
| Thaioil Power Co., Ltd. (TP) | Thai Paraxylene Co., Ltd. (TPX) | >> TP entered into a 25-year contract to supply TPX with power and steam at market prices. The contract will end in 2022. | 1,094 |
| | Thai Lube Base Plc (TLB) | >> TP entered into a 25-year contract to supply TLB with power and steam at market prices. The contract will end in 2022. | 651 |
| Thai Lube Base Plc (TLB) | IRPC Plc (IRPC) | >> Occasional purchase of by-products, considered normal business practice. | 192 |
| | PTT Oil and Retail Business Plc (PTTOR) | >> Revenue from occasional sale of lube base oil to PTTOR, considered normal business practice | 2,690 |
| Thai Paraxylene Co., Ltd. (TPX) | IRPC Plc (IRPC) | >> Occasional sale of aromatics, considered normal business practice. | 596 |
| | PTT International Trading Pte. Ltd. (PTTT) | >> Occasional sale of aromatics, considered normal business practice. | 4,496 |

| Company | Related Company | Transactions | Value in 2019 (Million Baht) |
|--------------------------------------|--|---|---------------------------------|
| TOP Solvent Co., Ltd. (TS) | IRPC Plc (IRPC) | >> Occasional purchase of solvents, considered normal business practice. | 1,100 |
| | PTT Global Chemical Plc (GC) | > Occasional sale of solvents, considered normal business practice. | 174 |
| | PTT Phenol Co., Ltd. | >> Occasional purchase of solvents, considered normal business practice. | 119 |
| Sak Chaisidhi Co., Ltd. (SAKC) | IRPC Plc (IRPC) | >> SAKC entered into a feedstock purchase contract with IRPC at an agreed volume based on reference market prices. The one-year contract ended in 2019. | 324 |
| | PTT Global Chemical Plc (GC) | >> SAKC entered into a feedstock purchase contract with GC at an agreed volume based on reference market prices. The contract will end upon a written notice from either party. | 2,104 |
| TOP Solvent (Vietnam) LLC. (TSV) | IRPC Plc (IRPC) | >> Occasional purchase of solvents, considered normal business practice. | 680 |
| Sapthip Co., Ltd. (SAP) | PTT Oil and Retail Business Plc (PTTOR) | >> SAP entered into a 10-year ethanol sale agreement with PTTOR at an agreed volume and prices as stipulated in the contract. The contract will end in June 2021. | 720 |
| TOP Maritime Service Co., Ltd. (TMS) | PTT Exploration and Production Plc (PTTEP) | >> TMS provided transportation services for PTTEP crews and supplies in the Gulf of Thailand. | 111 |

BOARD OF DIRECTORS' RESPONSIBILITY FOR FINANCIAL REPORTING

The accompanying financial statements of Thai Oil Public Company Limited and the consolidated financial statements of Thai Oil Public Company Limited and its subsidiaries have been prepared in conformity with the requirements of the Public Company Act B.E. 2535 (1992), the Securities and Exchange Act B.E. 2559 (2016), the Announcement of the Department of Business Development (No. 2) dated October 11, 2016 issued in accordance with Section 11, Paragraph 3 of the Accounting Act B.E. 2543 (2000), and the Financial Reporting Standards prescribed by the Federation of Accounting Professions under the Royal Patronage of His Majesty the King.

The Board of Directors is responsible for the financial statements which have been prepared to provide

assurance that the financial position, results of operations and cash flows are presented accurately, an effective internal control system has been established, accounting records have been properly and adequately maintained to safeguard assets and prevent fraud and other irregularities with material implications, suitable accounting policies have been selected in the preparation of the financial statements and consistently applied in accordance with Financial Reporting Standards, and key information has been adequately disclosed in the notes to the financial statements. The independent auditor has expressed opinion on the financial statements of Thai Oil Public Company Limited and the consolidated financial statements of Thai Oil Public Company Limited and its subsidiaries in the Auditor's Report.



(Professor Dr. Thosaporn Sirisumphand)
Chairman of the Board



(Mr. Wirat Uanarumit)
Chief Executive Officer and President

INDEPENDENT AUDITOR'S REPORT

To the shareholders and the Board of Directors of Thai Oil Public Company Limited

My opinion

In my opinion, the consolidated financial statements of Thai Oil Public Company Limited (the Company) and its subsidiaries (the Group) and the separate financial statements of the Company present fairly, in all material respects, the consolidated and separate financial position of the Group and of the Company as at 31 December 2019, and its consolidated and separate financial performance and its consolidated and separate cash flows for the year then ended in accordance with Thai Financial Reporting Standards (TFRSs).

What I have audited

The consolidated financial statements and the separate financial statements comprise:

- the consolidated and separate statements of financial position as at 31 December 2019;
- the consolidated and separate statements of income for the year then ended;
- the consolidated and separate statements of comprehensive income for the year then ended;
- the consolidated and separate statements of changes in equity for the year then ended;
- the consolidated and separate statements of cash flows for the year then ended; and
- the notes to the consolidated and separate financial statements, which include a summary of significant accounting policies.

Basis for opinion

I conducted my audit in accordance with Thai Standards on Auditing (TSAs). My responsibilities under those standards are further described in the Auditor's responsibilities for the audit of the consolidated and separate financial statements section of my report. I am independent of the Group and the Company in accordance with the Federation of Accounting Professions under the Royal Patronage of his Majesty the King's Code of Ethics for Professional Accountants together with the ethical requirements that are relevant to my audit of the consolidated and separate financial statements, and I have fulfilled my other ethical responsibilities in accordance with these requirements. I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my opinion.

Key audit matters

Key audit matters are those matters that, in my professional judgment, were of most significance in my audit of the consolidated and separate financial statements of the current period. These matters were addressed in the context of my audit of the consolidated and separate financial statements as a whole, and in forming my opinion thereon, and I do not provide a separate opinion on these matters.

Key audit matter

Goodwill impairment assessment

Refer to note 4.1 - Estimation of impairment of goodwill and note 17 - Goodwill.

The Group had goodwill of Baht 546.44 million arose from the historical acquisition of the solvent and petrochemical distribution business in Socialist Republic of Vietnam.

The management tested the impairment of goodwill annually at the level of a cash generating unit (CGU) and assessed its recoverable amount by applying the value-in-use model which involves significant management judgements in respect to the future operating results of business, projected cash flows and the discount rate applied to the projected cash flows. Key assumptions applied in assessing the value-in-use model are:

- revenue growth rates, expected changes to working capital, overhead costs and long-term growth rate in the business.
- discount rates calculated from capital structure, market risk and beta from available information in its industry.

From the result of impairment testing, the management determined that no impairment was recognised against this balance in the 2019 financial year.

I focused on the valuation of goodwill due to the significant value and the fact that the determination of value-in-use depends on a number of assumptions (e.g. revenue growth rates, expected changes to working capital and overhead costs to the businesses, and the discount rates). These assumptions involve significant judgement made by the management in assessing the possibility of future business plans.

How my audit addressed the key audit matter

I carried out the following audit procedures to assess the impairment test of goodwill prepared by management.

- Satisfied myself as to the appropriateness of management's identification of the CGUs.
- Held discussions with the management to understand the basis for the assumptions applied and evaluated whether the goodwill impairment testing process and assumptions had been applied consistently across the Group.
- Challenged management's significant assumptions used in goodwill impairment testing, especially in respect to the revenue growth rates, expected changes to working capital, overhead costs and long-term growth rate to the business. My procedures included comparing those assumptions to the external sources and management's approved business plan.
- Assessed the reasonableness of the business plan by comparing the plans of 2019 with actual results.
- Assessed the discount rate by considering and comparing with the independence data obtained from available public information of companies in the same industry sector to see whether the discount rate used by the management was within the acceptable range.
- Tested the sensitivity analysis of the key assumptions used in the discounted cash flows projection, such as long-term growth rate and discount rate, to assess the sensitivity impact and the impact from changes in these key assumptions.

As a result of the procedures performed, I did not found any irregularity of the management's assessment of the impairment and noted that the key assumptions used by management in assessing the possibility of future business plans are within the reasonable range.

Key audit matter

Impairment assessment in marine transportation services business

Refer to note 4.2 - Impairment of property, plant and equipment, note 4.3 - Impairment of investment in subsidiaries, note 13 - Investment in subsidiaries and note 16 - Property, plant and equipment, net

As of 31 December 2019, the Group's subsidiaries have certain vessels and crew boats which are not fully utilised in operation due to the slowdown in the exploration business which resulted in low freight charge and lower demand in marine transportation services. Management considered this as impairment indicators of vessels and crew boats of marine transportation services segment, which had net book value at Baht 2,455 million in consolidated financial statements. This also triggered the impairment indicator of loan to and investment in Thairoil Marine Co., Ltd., a direct subsidiary, amounting to Baht 590 million and Baht 970 million, respectively, in the separate financial statements. The management did not recognise provision for impairment during the year ended 2019.

Management performed impairment testing on vessels and crew boats in consolidated financial statements, and loan to a subsidiary and investment in a subsidiary in the separate financial statements and calculated the recoverable amount by comparing between the higher of the fair value less costs to sell and value-in-use. Management assessed its recoverable amount by applying value-in-use model. This value-in-use model involves significant judgements made by management in respect to the future operating results of business, projected cash flows and the discount rate applied to the projected cash flows. Key assumptions applied in the value-in-use model were:

How my audit addressed the key audit matter

I carried out the following audit procedures to assess the impairment assessment in marine transportation services business prepared by management.

- Assessed the appropriateness of management's identification of the indicators for impairment of vessels and crew boats, loan to a subsidiary and investment in a subsidiary.
- Held discussions with the management to understand the basis for the assumptions applied to the cash flow projections.
- Challenged management's significant assumptions used in impairment testing, especially in respect to the freight rate, utilisation rate, expected changes to working capital, overhead costs and long-term growth rate to the business. My procedures included comparing those assumptions to the external sources and management's approved business plan.
- Assessed the reasonableness of the business plan by comparing the plans of 2019 with actual results.
- Assessed the discount rate by considering and comparing with the independence data obtained from available public information of companies in the same industry sector to see whether the discount rate used by the management was within the acceptable range.
- Tested the sensitivity analysis of the key assumptions used in the discounted cash flows projection, such as forecasted revenue and discount rate, to assess the sensitivity impact and the impact from changes in these key assumptions.

Key audit matter

**Impairment assessment in marine
transportation services business**

- freight rate, utilisation rate, expected changes to working capital, operating expenditures in the business and long-term growth rate.
- discount rates calculated from capital structure, market risk and beta from available information in its industry.

I focused on the recoverable amount of vessels and crew boats, loans to a subsidiary and investment in a subsidiary due to its significant value and the determination of value-in-use depends on a number of assumptions. Those assumptions involve management's significant judgements in assessing the feasibility of future business plans.

How my audit addressed the key audit matter

As a result of the procedures performed, I did not find any irregularity of the management's assessment of the impairment and noted that the key assumptions used by management in assessing the possibility of future business plans are within the reasonable range.

Other information

The directors are responsible for the other information. The other information comprises the information included in the annual report, but does not include the consolidated and separate financial statements and my auditor's report thereon. The annual report is expected to be made available to me after the date of this auditor's report.

My opinion on the consolidated and separate financial statements does not cover the other information and I will not express any form of assurance conclusion thereon.

In connection with my audit of the consolidated and separate financial statements, my responsibility is to read the other information identified above when it becomes available and, in doing so, consider whether the other information is materially inconsistent with the consolidated and separate financial statements or my knowledge obtained in the audit, or otherwise appears to be materially misstated.

When I read the annual report, if I conclude that there is a material misstatement therein, I am required to communicate the matter to the audit committee.

**Responsibilities of the directors for the consolidated
and separate financial statements**

The directors are responsible for the preparation and fair presentation of the consolidated and separate financial statements in accordance with TFRSs, and for such internal control as the directors determine is necessary to enable the preparation of consolidated and separate financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated and separate financial statements, the directors are responsible for assessing the Group and the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of

accounting unless the directors either intend to liquidate the Group and the Company or to cease operations, or has no realistic alternative but to do so.

The audit committee assists the directors in discharging their responsibilities for overseeing the Group and the Company's financial reporting process.

Auditor's responsibilities for the audit of the consolidated and separate financial statements

My objectives are to obtain reasonable assurance about whether the consolidated and separate financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes my opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with TSAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated and separate financial statements.

As part of an audit in accordance with TSAs, I exercise professional judgment and maintain professional scepticism throughout the audit. I also:


- Identify and assess the risks of material misstatement of the consolidated and separate financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for my opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Group and the Company's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the directors.
- Conclude on the appropriateness of the directors' use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group and the Company's ability to continue as a going concern. If I conclude that a material uncertainty exists, I am required to draw attention in my auditor's report to the related disclosures in the consolidated and separate financial statements or, if such disclosures are inadequate, to modify my opinion. My conclusions are based on the audit evidence obtained up to the date of my auditor's report. However, future events or conditions may cause the Group and the Company to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated and separate financial statements, including the disclosures, and whether the consolidated and separate financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. I am responsible for the direction, supervision and performance of the group audit. I remain solely responsible for my audit opinion.

I communicate with the audit committee regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that I identify during my audit.

I also provide the audit committee with a statement that I have complied with relevant ethical requirements regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on my independence, and where applicable, related safeguards.

From the matters communicated with the audit committee, I determine those matters that were of most significance in the audit of the consolidated and separate financial statements of the current period and are therefore the key audit matters. I describe these matters in my auditor's report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, I determine that a matter should not be communicated in my report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

PricewaterhouseCoopers ABAS Ltd.



Boonrueng Lerdwiseswit

Certified Public Accountant (Thailand) No. 6552

Bangkok

14 February 2020

STATEMENT OF FINANCIAL POSITION

Thai Oil Public Company Limited

As at 31 December 2019

| (Baht) | | | | | |
|--|-------|--------------------------------------|------------------------|----------------------------------|------------------------|
| | | Consolidated financial statements | | Separate financial statements | |
| | Notes | 2019 | 2018 | 2019 | 2018 |
| Assets | | | | | |
| Current assets | | | | | |
| Cash and cash equivalents | 7 | 74,854,227,157 | 33,741,253,152 | 71,042,494,404 | 29,868,078,023 |
| Deposits at a financial institution used as collaterals | 8 | 325,490,108 | 300,217,881 | - | - |
| Short-term investments | 9 | 1,757,198,402 | 73,220,568,315 | 1,757,147,380 | 73,027,317,304 |
| Trade accounts receivable, net | 10 | 22,465,507,253 | 24,359,024,864 | 23,633,527,215 | 25,193,925,665 |
| Other receivables | 11 | 1,287,783,429 | 1,381,634,279 | 1,173,423,156 | 1,443,680,409 |
| Short-term loans to related parties | 39 | - | - | 3,220,801,950 | 4,274,000,000 |
| Short-term loans to a third party | | - | 45,000,000 | - | - |
| Inventories, net | 12 | 30,292,424,978 | 28,738,502,329 | 26,657,406,141 | 24,423,642,318 |
| Prepaid corporate income tax | | 1,268,667,630 | 937,573,494 | 1,146,450,472 | 860,134,701 |
| Value added tax receivables | | 752,487,659 | 630,751,760 | 243,487,143 | 36,760,012 |
| Receivables from oil fuel fund | | 1,672,503,239 | 1,388,932,491 | 1,672,503,239 | 1,388,932,491 |
| Total current assets | | 134,676,289,855 | 164,743,458,565 | 130,547,241,100 | 160,516,470,923 |
| Non-current assets | | | | | |
| Available-for-sale investments | 9 | 382,545,317 | 360,515,845 | 382,545,317 | 360,515,845 |
| Investments in subsidiaries | 13 | - | - | 15,014,809,002 | 14,555,419,002 |
| Investments in joint ventures | 14 | 617,494,075 | 624,895,464 | - | - |
| Investments in associates | 14 | 32,441,826,592 | 14,315,601,209 | 7,852,111,863 | 1,260,604,927 |
| Other long-term investments | 9 | 820,475,807 | 779,871,900 | 820,475,807 | 779,871,900 |
| Long-term loans to related parties | 39 | - | - | 11,781,334,798 | 400,000,000 |
| Investment properties, net | 15 | 102,520,270 | 102,520,270 | 1,141,368,248 | 1,100,443,418 |
| Property, plant and equipment, net | 16 | 106,559,156,720 | 79,929,021,500 | 68,321,456,357 | 39,989,649,341 |
| Goodwill | 17 | 765,013,432 | 790,085,313 | - | - |
| Intangible assets, net | 18 | 2,386,881,501 | 2,254,956,610 | 649,079,255 | 529,008,978 |
| Deferred tax assets | 19 | 670,855,534 | 629,338,970 | 556,743,979 | 515,758,780 |
| Deferred land lease arrangement, net | | 3,217,652,692 | 3,244,406,394 | 3,154,138,346 | 3,169,006,005 |
| Other non-current assets | | 803,815,608 | 838,281,436 | 649,600,879 | 668,319,370 |
| Total non-current assets | | 148,768,237,548 | 103,869,494,911 | 110,323,663,851 | 63,328,597,566 |
| Total assets | | 283,444,527,403 | 268,612,953,476 | 240,870,904,951 | 223,845,068,489 |

The accompanying notes are an integral part of these consolidated and separate financial statements.

STATEMENT OF FINANCIAL POSITION

Thai Oil Public Company Limited

As at 31 December 2019

(Baht)

| | | Consolidated financial statements | | Separate financial statements | |
|---------------------------------------|-------|--------------------------------------|------------------------|----------------------------------|------------------------|
| | Notes | 2019 | 2018 | 2019 | 2018 |
| Liabilities and equity | | | | | |
| Current liabilities | | | | | |
| Short-term loans from | | | | | |
| financial institutions | 20 | 1,576,140,678 | 2,391,675,227 | - | - |
| Trade accounts payable | 21 | 25,015,153,158 | 21,844,262,665 | 27,134,381,690 | 23,516,749,444 |
| Other payables | 22 | 9,106,115,537 | 3,871,803,863 | 8,530,649,715 | 3,575,377,315 |
| Short-term loans from related parties | 39 | - | - | 2,467,426,531 | 1,506,552,107 |
| Current portion of long-term loans | | | | | |
| from financial institutions, net | 23 | 1,335,895,120 | 1,548,627,370 | - | - |
| Current portion of debentures, net | 24 | - | 3,000,000,000 | - | 3,000,000,000 |
| Excise duty payables | | 1,417,726,777 | 4,814,818,139 | 1,417,726,777 | 4,814,818,139 |
| Income tax payables | | 215,015,835 | 548,624,898 | - | - |
| Other current liabilities | | 652,238 | 238,733 | 652,238 | 238,733 |
| Total current liabilities | | 38,666,699,343 | 38,020,050,895 | 39,550,836,951 | 36,413,735,738 |
| Non-current liabilities | | | | | |
| Long-term loans from | | | | | |
| financial institutions, net | 23 | 13,884,311,639 | 14,837,873,738 | - | - |
| Long-term loans from a third party | 23 | 219,437,500 | 216,437,500 | - | - |
| Long-term loans from related parties | 39 | 3,998,847,362 | - | 65,366,055,503 | 52,028,386,444 |
| Debentures, net | 24 | 97,184,200,848 | 85,065,238,416 | 32,129,435,098 | 33,008,687,149 |
| Deferred tax liabilities | 19 | 124,916,226 | 37,020,089 | - | - |
| Employee benefit obligations | 25 | 4,586,029,274 | 3,586,980,032 | 3,954,907,138 | 3,183,164,072 |
| Other non-current liabilities | | 856,576,209 | 376,974,231 | 1,149,139,617 | 524,495,928 |
| Total non-current liabilities | | 120,854,319,058 | 104,120,524,006 | 102,599,537,356 | 88,744,733,593 |
| Total liabilities | | 159,521,018,401 | 142,140,574,901 | 142,150,374,307 | 125,158,469,331 |

The accompanying notes are an integral part of these consolidated and separate financial statements.

STATEMENT OF FINANCIAL POSITION

Thai Oil Public Company Limited

As at 31 December 2019

| | | | | | (Baht) |
|---|----------|--------------------------------------|------------------------|----------------------------------|------------------------|
| | | Consolidated financial statements | | Separate financial statements | |
| | Notes | 2019 | 2018 | 2019 | 2018 |
| Liabilities and equity (Continued) | | | | | |
| Equity | | | | | |
| Share capital | 26 | | | | |
| Authorised share capital | | | | | |
| - 2,040,027,873 ordinary shares | | | | | |
| at par value of Baht 10 each | | 20,400,278,730 | 20,400,278,730 | 20,400,278,730 | 20,400,278,730 |
| Issued and paid-up share capital | | | | | |
| - 2,040,027,873 ordinary shares | | | | | |
| paid-up of Baht 10 each | | 20,400,278,730 | 20,400,278,730 | 20,400,278,730 | 20,400,278,730 |
| Share premium on ordinary shares | 26 | 2,456,261,491 | 2,456,261,491 | 2,456,261,491 | 2,456,261,491 |
| Other surpluses (deficits) | | (3,361,230,760) | 303,596,612 | - | - |
| Retained earnings | | | | | |
| Appropriated | | | | | |
| - Legal reserve | 27 | 2,040,027,873 | 2,040,027,873 | 2,040,027,873 | 2,040,027,873 |
| - Other reserves | | 244,500,000 | 244,500,000 | 244,500,000 | 244,500,000 |
| Unappropriated | | 97,996,594,207 | 96,400,250,174 | 73,513,426,297 | 73,487,768,327 |
| Other components of equity | | 196,306,468 | (132,892,315) | 66,036,253 | 57,762,737 |
| Equity attributable to the | | | | | |
| owners of the parent | | 119,972,738,009 | 121,712,022,565 | 98,720,530,644 | 98,686,599,158 |
| Non-controlling interests | 13.3, 28 | 3,950,770,993 | 4,760,356,010 | - | - |
| Total equity | | 123,923,509,002 | 126,472,378,575 | 98,720,530,644 | 98,686,599,158 |
| Total liabilities and equity | | 283,444,527,403 | 268,612,953,476 | 240,870,904,951 | 223,845,068,489 |

The accompanying notes are an integral part of these consolidated and separate financial statements.

STATEMENT OF INCOME

Thai Oil Public Company Limited
For the year ended 31 December 2019

(Baht)

| | Notes | Consolidated financial statements | | Separate financial statements | |
|---|-------|--------------------------------------|------------------------|----------------------------------|------------------------|
| | | 2019 | 2018 | 2019 | 2018 |
| Revenue from sales and services | 6 | 362,179,344,650 | 389,042,328,430 | 375,400,619,826 | 404,829,381,359 |
| Subsidy from oil fuel fund | | 2,147,366,790 | 3,123,231,734 | 2,147,366,790 | 3,123,231,734 |
| Total revenue | | 364,326,711,440 | 392,165,560,164 | 377,547,986,616 | 407,952,613,093 |
| Cost of sales of goods and services | | (355,756,268,016) | (375,950,002,159) | (374,844,362,993) | (401,030,476,222) |
| Gross profit | | 8,570,443,424 | 16,215,558,005 | 2,703,623,623 | 6,922,136,871 |
| Dividend income | | 167,106,044 | 157,371,998 | 2,493,896,889 | 4,257,840,783 |
| Net derivative gain (loss) | | | | | |
| on hedging instruments | | 358,864,902 | (820,524,349) | (210,628,354) | (236,862,872) |
| Net foreign exchange gain | | 1,775,101,504 | 626,683,439 | 1,847,435,026 | 430,095,814 |
| Other income | 29 | 1,576,664,491 | 1,718,921,457 | 3,466,515,162 | 3,704,131,833 |
| Selling expenses | | (404,947,419) | (423,970,790) | (60,645,947) | (72,892,487) |
| Administrative expenses | | (2,279,280,408) | (2,357,752,867) | (2,398,584,521) | (2,435,738,911) |
| Share of profit of joint ventures and associates, net | 14 | 1,299,352,036 | 1,192,891,937 | - | - |
| Profit before finance costs and income tax expense | | 11,063,304,574 | 16,309,178,830 | 7,841,611,878 | 12,568,711,031 |
| Finance costs | | (3,307,491,913) | (3,510,847,618) | (2,660,072,989) | (2,942,417,762) |
| Finance costs from repurchase of debentures | | - | (431,099,841) | - | (431,099,841) |
| Profit before income tax expense | | 7,755,812,661 | 12,367,231,371 | 5,181,538,889 | 9,195,193,428 |
| Income tax expense | 32 | (1,239,408,164) | (1,982,789,060) | (526,174,798) | (954,711,119) |
| Net profit for the year | | 6,516,404,497 | 10,384,442,311 | 4,655,364,091 | 8,240,482,309 |
| Profit attributable to: | | | | | |
| Owners of the parent | | 6,276,681,543 | 10,149,038,048 | 4,655,364,091 | 8,240,482,309 |
| Non-controlling interests | | 239,722,954 | 235,404,263 | - | - |
| Net profit for the year | | 6,516,404,497 | 10,384,442,311 | 4,655,364,091 | 8,240,482,309 |
| Basic earnings per share | 34 | 3.08 | 4.97 | 2.28 | 4.04 |

The accompanying notes are an integral part of these consolidated and separate financial statements.

STATEMENT OF COMPREHENSIVE INCOME

Thai Oil Public Company Limited
For the year ended 31 December 2019

| (Baht) | | | | |
|---|--------------------------------------|-----------------------|----------------------------------|----------------------|
| Notes | Consolidated financial statements | | Separate financial statements | |
| | 2019 | 2018 | 2019 | 2018 |
| Net profit for the year | 6,516,404,497 | 10,384,442,311 | 4,655,364,091 | 8,240,482,309 |
| Other comprehensive income (expense) | | | | |
| Items that will be reclassified subsequently to profit or loss | | | | |
| Net changes in fair value of available-for-sale investments, net of tax | 8,273,516 | (11,147,085) | 8,273,516 | (11,147,085) |
| Exchange difference on translation of financial statements | 350,031,914 | (30,790,007) | - | - |
| Share of other comprehensive income (expense) of an associate accounted for using the equity method, net of tax | (35,645,251) | 5,355,995 | - | - |
| Total items that will be reclassified subsequently to profit or loss | 322,660,179 | (36,581,097) | 8,273,516 | (11,147,085) |
| Items that will not be reclassified subsequently to profit or loss | | | | |
| Remeasurements of post-employment benefit obligations, net of tax | (291,305,681) | (412,747) | (243,658,190) | - |
| Share of other comprehensive expense of associates accounted for using the equity method, net of tax | (3,254,228) | (17,600,081) | - | - |
| Total items that will not be reclassified subsequently to profit or loss | (294,559,909) | (18,012,828) | (243,658,190) | - |
| Other comprehensive income (expense) for the year, net of tax | 28,100,270 | (54,593,925) | (235,384,674) | (11,147,085) |
| Total comprehensive income for the year | 6,544,504,767 | 10,329,848,386 | 4,419,979,417 | 8,229,335,224 |
| Total comprehensive income attributable to: | | | | |
| Owners of the parent | 6,311,590,747 | 10,096,673,404 | 4,419,979,417 | 8,229,335,224 |
| Non-controlling interests | 232,914,020 | 233,174,982 | - | - |
| Total comprehensive income for the year | 6,544,504,767 | 10,329,848,386 | 4,419,979,417 | 8,229,335,224 |

The accompanying notes are an integral part of these consolidated and separate financial statements.

STATEMENT OF CHANGES IN EQUITY

Thai Oil Public Company Limited

For the year ended 31 December 2019

| Consolidated financial statements | | | | | | | | | | | | | | | (Baht) |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--------|
| Equity attributable to the owners of the parent | | | | | | | | | | | | | | | |
| Other components of equity | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

The accompanying notes are an integral part of these consolidated and separate financial statements.

STATEMENT OF CHANGES IN EQUITY

Thai Oil Public Company Limited

For the year ended 31 December 2019

| | Separate financial statements | | | | | | | (Baht) | |
|--|-------------------------------|--|------------------|---------------------------------|----------------------------------|------------------|---|------------------|--|
| | Note | Issued and paid-up share capital | Share premium | Retained earnings | | | Other components of equity | | |
| | | | | Appropriated - legal reserve | Appropriated - other reserves | Unappropriated | Other comprehensive income (expense) | | Fair value changes in available-for-sale investments |
| | | | | | | | | | |
| Opening balance as at 1 January 2018 | | 20,400,278,730 | 2,456,261,491 | 2,040,027,873 | 244,500,000 | 75,955,969,926 | 68,909,822 | 101,165,947,842 | |
| Dividend | | - | - | - | - | (10,708,683,908) | - | (10,708,683,908) | |
| Total comprehensive income (expense) for the year | | | | | | | | | |
| Net profit for the year | | - | - | - | - | 8,240,482,309 | - | 8,240,482,309 | |
| Other comprehensive expense for the year | | - | - | - | - | - | (11,147,085) | (11,147,085) | |
| Closing balance as at 31 December 2018 | | 20,400,278,730 | 2,456,261,491 | 2,040,027,873 | 244,500,000 | 73,487,768,327 | 57,762,737 | 98,686,599,158 | |
| Opening balance as at 1 January 2019 | | 20,400,278,730 | 2,456,261,491 | 2,040,027,873 | 244,500,000 | 73,487,768,327 | 57,762,737 | 98,686,599,158 | |
| Dividend | 35 | - | - | - | - | (4,386,047,931) | - | (4,386,047,931) | |
| Total comprehensive income for the year | | | | | | | | | |
| Net profit for the year | | - | - | - | - | 4,655,364,091 | - | 4,655,364,091 | |
| Other comprehensive income (expense) for the year | | - | - | - | - | (243,658,190) | 8,273,516 | (235,384,674) | |
| Closing balance as at 31 December 2019 | | 20,400,278,730 | 2,456,261,491 | 2,040,027,873 | 244,500,000 | 73,513,426,297 | 66,036,253 | 98,720,530,644 | |

The accompanying notes are an integral part of these consolidated and separate financial statements.

STATEMENT OF CASH FLOWS

Thai Oil Public Company Limited
For the year ended 31 December 2019

(Baht)

| | | Consolidated financial statements | | Separate financial statements | |
|--|-------|--------------------------------------|-----------------|----------------------------------|-----------------|
| | Notes | 2019 | 2018 | 2019 | 2018 |
| Cash flows from operating activities | | | | | |
| Net profit for the year | | 6,516,404,497 | 10,384,442,311 | 4,655,364,091 | 8,240,482,309 |
| Adjustments to reconcile profit (loss) to cash: | | | | | |
| (Reversal of) Allowance for decline in value of inventories adjusted to net realisable value | 12 | (1,255,176,302) | 1,350,443,972 | (1,312,869,399) | 1,313,858,368 |
| Depreciation and amortisation | 31 | 7,084,549,254 | 7,263,783,285 | 3,747,128,900 | 3,787,642,038 |
| Finance costs | | 3,307,491,913 | 3,510,847,618 | 2,660,072,989 | 2,942,417,762 |
| Finance costs from repurchase of debentures | | - | 431,099,841 | - | 431,099,841 |
| Unrealised (gain) loss on foreign exchange | | (1,807,557,284) | 428,191,957 | (1,792,848,621) | 427,512,032 |
| Share of profit of joint ventures and associates, net | | (1,299,352,036) | (1,192,891,937) | - | - |
| Dividend income | | (167,106,044) | (157,371,998) | (2,493,896,889) | (4,257,840,783) |
| Gain on disposal of investments | | (3,781,987) | (1,523,522) | (3,781,987) | (1,523,522) |
| Loss from the change in the ownership interests in an associate | | 2,919,431 | - | - | - |
| Reversal of impairment loss on property, plant and equipment and investment property | 15,16 | (11,656,205) | - | (11,656,205) | - |
| Impairment loss on non-current assets classified as held-for-sale | | 43,807,963 | - | - | - |
| Gain on disposal of non-current assets classified as held-for-sale | | (5,568,040) | - | - | - |
| Loss on disposal of property, plant and equipment | | 65,561,345 | 2,808,995 | 14,131,797 | 1,622,872 |
| Amortisation of advance receipts for land lease and others | | (23,617,059) | (24,758,209) | (149,412,722) | (147,874,075) |
| Income tax expense | | 1,239,408,164 | 1,982,789,060 | 526,174,798 | 954,711,119 |
| | | 13,686,327,610 | 23,977,861,373 | 5,838,406,752 | 13,692,107,961 |

The accompanying notes are an integral part of these consolidated and separate financial statements.

STATEMENT OF CASH FLOWS

Thai Oil Public Company Limited
For the year ended 31 December 2019

| (Baht) | | | | |
|--|--------------------------------------|-----------------|----------------------------------|-----------------|
| | Consolidated financial statements | | Separate financial statements | |
| Notes | 2019 | 2018 | 2019 | 2018 |
| Changes in operating assets and liabilities | | | | |
| Trade accounts receivable | 1,919,573,276 | (2,061,153,981) | 1,557,142,564 | (963,003,532) |
| Other receivables | (270,545,044) | (559,425,087) | (119,831,888) | (630,982,298) |
| Inventories | (294,655,513) | 2,751,955,346 | (920,894,425) | 2,356,965,271 |
| Value added tax receivables | (121,735,899) | 120,836,623 | (206,727,131) | (36,760,012) |
| Receivables from oil fuel fund | (283,570,748) | (359,879,008) | (283,570,748) | (359,879,008) |
| Other non-current assets | (52,878,187) | (2,951,945,960) | (34,583,680) | (2,977,634,638) |
| Trade accounts payable | 3,102,215,624 | 2,977,035,656 | 3,562,917,307 | 2,550,746,871 |
| Other payables | (519,542,174) | 142,307,634 | (401,256,824) | 1,050,028,233 |
| Excise duty payables | (3,397,091,362) | 29,922,874 | (3,397,091,362) | 29,922,874 |
| Other non-current liabilities | 1,121,296,638 | 220,682,015 | 1,108,784,005 | 68,138,049 |
| Cash generated from operating activities | 14,889,394,221 | 24,288,197,485 | 6,703,294,570 | 14,779,649,771 |
| Income tax paid | (1,802,196,337) | (5,975,151,623) | (809,070,284) | (4,736,444,150) |
| Net cash generated from operating activities | 13,087,197,884 | 18,313,045,862 | 5,894,224,286 | 10,043,205,621 |

The accompanying notes are an integral part of these consolidated and separate financial statements.

STATEMENT OF CASH FLOWS

Thai Oil Public Company Limited
For the year ended 31 December 2019

(Baht)

| | | Consolidated financial statements | | Separate financial statements | |
|--|--------|--------------------------------------|------------------|----------------------------------|------------------|
| | Notes | 2019 | 2018 | 2019 | 2018 |
| Cash flows from investing activities | | | | | |
| Dividends received | | 763,067,614 | 772,443,637 | 2,493,896,889 | 4,257,840,783 |
| Payments for deposits at a financial institution used as collaterals | | (25,272,227) | (300,217,881) | - | - |
| Proceeds from (repayment of) disposal of short-term investments, net | | 72,284,629,882 | (21,597,119,763) | 72,091,429,893 | (21,824,510,133) |
| Purchase of available-for-sale investments | | - | (5,010,249) | - | (5,010,249) |
| Proceeds from disposal of available-for-sale investments | | - | 2,737,427,082 | - | 2,737,427,082 |
| Purchase of other long-term investments | | (40,603,906) | - | (40,603,907) | - |
| Payments for short-term loans to related parties | 39 | - | - | (1,029,395,550) | (310,000,000) |
| Proceeds from short-term loans to related parties | 39 | - | - | 2,078,500,000 | 11,686,500,000 |
| Proceeds from short-term loans to a third party | | 45,000,000 | 45,000,000 | - | - |
| Payments for long-term loans to related parties | 39 | - | - | (11,381,334,798) | (400,000,000) |
| Proceeds from long-term loans to savings co-operative of employees | | 11,799,334 | 45,991,743 | 11,799,334 | 45,991,743 |
| Proceeds from disposal of property, plant and equipment | | 63,691,076 | 128,649,619 | 523,832 | 16,400 |
| Purchase of property, plant and equipment | | (27,530,693,950) | (7,863,692,892) | (26,016,560,982) | (6,975,873,167) |
| Purchase of intangible assets | | (217,724,051) | (130,835,947) | (213,474,741) | (82,816,383) |
| Net cash payment from acquisition of investments in subsidiaries | 13, 40 | (38,779,966) | - | (459,390,000) | - |
| Payments for investment in an associate | 14 | (21,971,689,097) | - | (6,591,506,936) | - |
| Net cash from (used in) investing activities | | | | | |
| | | 23,343,424,709 | (26,167,364,651) | 30,943,883,034 | (10,870,433,924) |

The accompanying notes are an integral part of these consolidated and separate financial statements.

STATEMENT OF CASH FLOWS

Thai Oil Public Company Limited
For the year ended 31 December 2019

| | | | | | (Baht) |
|--|----------|--------------------------------------|-----------------------|----------------------------------|-----------------------|
| | | Consolidated financial statements | | Separate financial statements | |
| | Notes | 2019 | 2018 | 2019 | 2018 |
| Cash flows from financing activities | | | | | |
| Finance costs paid | | (3,256,810,814) | (3,371,009,367) | (2,703,069,927) | (3,374,795,938) |
| Finance costs paid for repurchase of debentures | | - | (56,631,225) | - | (56,631,225) |
| Dividends paid to the shareholders of the parent | | (4,386,047,931) | (10,708,683,908) | (4,386,047,931) | (10,708,683,908) |
| Dividends paid to non-controlling interests | | (239,969,054) | (297,032,038) | - | - |
| Proceeds from short-term loans from financial institutions | 20 | 6,990,241,219 | 29,126,652,825 | - | 18,990,292,661 |
| Repayment of short-term loans from financial institutions | 20 | (7,805,775,768) | (27,622,780,554) | - | (18,990,292,661) |
| Proceeds from short-term loans from related parties | 39 | - | - | 960,874,423 | 1,003,334,040 |
| Proceeds from long-term loans from related parties | 39 | 3,998,847,362 | - | 17,061,833,572 | 51,606,332,137 |
| Proceeds from long-term loans from financial institutions | 23 | 111,889,243 | 14,943,975,491 | - | - |
| Repayment of long-term loans from financial institutions | 23 | (1,265,388,254) | (8,006,998,447) | - | - |
| Proceeds from debenture | 24 | 17,037,010,000 | 51,634,496,961 | - | - |
| Payment for debentures financing fee | 24 | (54,750,129) | - | - | - |
| Redemption of debenture | 24 | (3,000,000,000) | (20,076,405,723) | (3,000,000,000) | (20,076,405,723) |
| Net cash from financing activities | | 8,129,245,874 | 25,565,584,015 | 7,933,590,137 | 18,393,149,383 |
| Net increase in cash and cash equivalents | | | | | |
| Cash and cash equivalents at the beginning of the year | | 33,741,253,152 | 15,623,426,718 | 29,868,078,023 | 11,914,509,851 |
| Effect of exchange rate changes | | (3,446,894,462) | 406,561,208 | (3,597,281,076) | 387,647,092 |
| Cash and cash equivalents at the end of the year | 7 | 74,854,227,157 | 33,741,253,152 | 71,042,494,404 | 29,868,078,023 |
| Non-cash transactions | | | | | |
| Payables on purchase of property, plant and equipment | | 6,224,952,259 | 567,076,652 | 6,035,121,780 | 496,162,798 |
| Payables on purchase of intangible assets | | 344,437,751 | 243,155,260 | 3,800 | |

The accompanying notes are an integral part of these consolidated and separate financial statements.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

1 General information

Thai Oil Public Company Limited (the Company) is a public limited company which is incorporated and domiciled in Thailand and is listed on the Stock Exchange of Thailand. The address of the Company's registered offices and refinery plant as follows:

| | |
|------------------------------------|---|
| Head office | 555/1 Energy Complex Building A, 11th Floor, Vibhavadi Rangsit Road, Kwang Chatuchak, Khet Chatuchak, Bangkok 10900, Thailand |
| Sriracha office and refinery plant | 42/1 Moo 1, Sukhumvit Road Km. 124, Tambol Tungsukla, Amphur Sriracha, Chonburi 20230, Thailand |

For reporting purposes, the Company and its subsidiaries are referred to as the Group.

The principal business operations of the Group is oil refinery and distributions, petrochemicals, lube base oil and other businesses in domestic and overseas.

These Group consolidated financial statements were authorised for issue by the board of directors on 14 February 2020.

2 Accounting policies

The principal accounting policies applied in the preparation of these consolidated and separate financial statements are set out below:

2.1 Basis of preparation

The consolidated and separate financial statements have been prepared in accordance with Thai generally accepted accounting principles under the Accounting Act B.E. 2543, being those Thai Financial Reporting Standards issued under the Accounting Profession Act B.E. 2547, and the financial reporting requirements of the Securities and Exchange Commission under the Securities and Exchange Act.

The consolidated and separate financial statements have been prepared under the historical cost convention except as disclosed in the accounting policies below.

The preparation of financial statements in conformity with Thai generally accepted accounting principles requires the Group to use certain critical accounting estimates. It also requires management to exercise its judgement in the process of applying the Group's accounting policies. The areas involving a higher degree of judgment or complexity, or areas where assumptions and estimates are significant to the consolidated and separate financial statements are disclosed in note 4.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

An English version of the consolidated and separate financial statements have been prepared from the statutory financial statements that are in the Thai language. In the event of a conflict or a difference in interpretation between the two languages, the Thai language statutory financial statements shall prevail.

2.2 New and amended financial reporting standards that are relevant and have significant impacts to the Group

2.2.1 The Group has applied standard and amendments for the first time for their annual reporting commencing 1 January 2019.

Starting from 1 January 2019, the Group has applied standard and amendments which are effective for annual periods beginning on or after 1 January 2019 and are relevant to the Group. The adoption of these standards do not have significant impact on the Group.

2.2.2 New and amended financial reporting standards that are effective for accounting period beginning or after 1 January 2020. The Group has not yet early adopted these standards.

a) Financial instruments

The new financial reporting standards relate to financial instruments are:

| | |
|----------|---|
| TAS 32 | Financial instruments: Presentation |
| TFRS 7 | Financial Instruments: Disclosures |
| TFRS 9 | Financial Instruments |
| TFRIC 16 | Hedges of a Net Investment in a Foreign Operation |
| TFRIC 19 | Extinguishing Financial Liabilities with Equity Instruments |

These new standards address the classification, measurement, derecognition of financial assets and financial liabilities, impairment of financial assets, hedge accounting, and presentation and disclosure of financial instruments.

The Group's management is in the process of evaluating the impact from implementing such financial reporting standards.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

b) TFRS 16, Leases

Where the Group is a lessee, TFRS 16, Leases will result in almost all leases being recognised on the statement of financial position as the distinction between operating and finance leases is removed. A right-of-use asset and a lease liability will be recognised, with exception on short-term and low-value leases.

The Group's management is in the process of evaluating the impact from implementing such financial reporting standards.

2.3 Group accounting - investments in subsidiaries and associates and in joint arrangements

2.3.1 Subsidiaries

Subsidiaries are all entities (including structured entities) over which the Group has control. The Group controls an entity when the Group is exposed to, or has rights to, variable returns from its involvement with the entity and has the ability to affect those returns through its power over the entity. Subsidiaries are fully consolidated from the date on which control is transferred to the Group. They are deconsolidated from the date that control ceases.

The Group applies the acquisition method to account for business combinations except business combination under common control. The consideration transferred for the acquisition of a subsidiary is the fair value of the assets transferred, the liabilities incurred to the former owners of acquiree and the equity interests issued by the Group. The consideration transferred includes the fair value of any asset or liability resulting from a contingent consideration arrangement. Acquisition-related costs are expensed as incurred. Identifiable assets acquired and liabilities and contingent liabilities assumed in a business combination are measured initially at their fair values at the acquisition date. On an acquisition-by-acquisition basis, the Group recognises any non-controlling interest in the acquiree either at fair value or at the non-controlling interest's proportionate share of the acquiree's net assets.

If the business combination is achieved in stages, the acquisition date carrying value of the acquirer's previously held equity interest in the acquiree is re-measured to fair value at the acquisition date; any gains or losses arising from such re-measured are recognised in profit or loss.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Any contingent consideration to be transferred by the Group is recognised at fair value at the acquisition date. Subsequent changes to the fair value of the contingent consideration that is deemed to be an asset or liability is recognised in profit or loss. Contingent consideration that is classified as equity is not re-measured, and its subsequent settlement is accounted for within equity.

The excess of the consideration transferred, the amount of any non-controlling interest in the acquiree and the acquisition date fair value of any previous equity interest in the acquiree over the fair value of the identifiable net assets acquired is recorded as goodwill. If the total of consideration transferred, non-controlling interest recognised and previously held interest measured is less than the fair value of the net assets of the subsidiary acquired in the case of a bargain purchase, the difference is recognised directly in profit or loss.

Intercompany transactions, balances and unrealised gains on transactions between group companies are eliminated. Unrealised losses are also eliminated unless the transaction provides evidence of an impairment of the transferred asset. Accounting policies of subsidiaries have been changed where necessary to ensure consistency with the policies adopted by the Group.

2.3.2 Transactions with non-controlling interests

The Group treats transactions with non-controlling interests as transactions with equity owners of the Group. For purchases from non-controlling interests, the difference between any consideration paid and the relevant share acquired of the carrying value of net assets of the subsidiary is recorded in equity. Gains or losses on disposals to non-controlling interests are also recorded in equity.

2.3.3 Disposal of subsidiaries

When the Group ceases to have control, it shall cease to consolidate its subsidiaries. Any retained interest in the entity is re-measured to its fair value, with the change in carrying amount recognised in profit or loss. The fair value is the initial carrying amount for the purposes of subsequently accounting for the retained interest as an associate, joint venture or financial asset. In addition, any amounts previously recognised in other comprehensive income in respect of that entity are accounted for as if the Group had directly disposed of the related assets or liabilities.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

2.3.4 Business combination under common control

The Group accounts for business combination under common control by measuring acquired assets and liabilities of the acquiree in the proportion of interests under common control at the carrying values of the acquiree presented in the highest level of the consolidation prior to the business combination under common control at the acquisition date. The Group retrospectively adjusted the business combination under common control transactions as if the combination occurred from the beginning of period of which the financial statements in the previous period are comparatively presented in accordance with the guidance of business combination under common control as issued by the Federation of Accounting Professions.

Costs of business combination under common control are the aggregated amount of fair value of assets transferred, liabilities incurred and equity instruments issued by the acquirer at the date of which the exchange in control occurs. Other costs directly attributable to business combination under common control, such as professional fees of legal advisors and other advisors, registration fees, and costs relating to preparation of information for shareholders, are capitalised as an investment in the separate financial statements while immediately recognised as expenses in the consolidated financial statements in the period in which the business combination occurs.

The difference between costs of business combination under common control and the acquirer's interests in the carrying value of the acquiree is presented as "Surplus arising from business combination under common control" in equity and is derecognised when the investment is disposed by transfer to retained earnings.

2.3.5 Associates

Associates are all entities over which the Group has significant influence but not control, generally accompanying a shareholding of between 20% and 50% of the voting rights. Investments in associates are accounted for using the equity method of accounting.

2.3.6 Joint venture

Investments in joint arrangements are classified as either joint operations or joint ventures depending on the contractual rights and obligations of each investor, rather than the legal structure of the joint arrangements.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Joint operations

A joint operation is a joint arrangement whereby the Group has rights to the assets, and obligations for the liabilities relating to the arrangement. The Group recognises its direct right to the assets, liabilities, revenues and expenses of joint operations and its share of any jointly held or incurred assets, liabilities, revenues and expenses. These have been incorporated in the financial statements under the appropriate headings.

Joint venture

A joint venture is a joint arrangement whereby the Group has rights to the net assets of the arrangement. Interests in joint ventures are accounted for using the equity method of accounting.

2.3.7 Accounting under equity method

Under the equity method, the investment is initially recognised at cost, and the carrying amount is increased or decreased to recognise the investor's share of the profit or loss of the investee after the date of acquisition. The Group's investment in associates includes goodwill identified on acquisition.

If the ownership interest in associates and joint ventures is reduced but significant influence is retained, only a proportionate share of the amounts previously recognised in other comprehensive income is reclassified to profit or loss where appropriate. Profit or loss from reduce of the ownership interest in an associate and joint venture is recognised in profit or loss.

The Group's share of its associates and joint ventures' post-acquisition profits or losses is recognised in the profit or loss, and its share of post-acquisition movements in other comprehensive income is recognised in other comprehensive income. The cumulative post-acquisition movements are adjusted against the carrying amount of the investment. When the Group's share of losses in associates and joint ventures equals or exceeds its interest in the associates and joint ventures, together with any long-term interests that, in substance, form part of the entity's net investment in the associates or joint ventures, the Group does not recognise further losses, unless it has liability obligations or commit to pay liability on behalf of the associates and joint ventures.

The Group determines at each reporting date whether there is any objective evidence that the investments in the associates and joint ventures are impaired. If this is the case, the Group calculates the amount of impairment as the difference between the recoverable amount of the investments and its carrying value and recognises the impairment amount to share of profit (loss) of associates and joint ventures in profit or loss.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Unrealised gains on transactions between the Group and its associates and joint ventures are eliminated to the extent of the Group's interest in the associates and joint ventures. Unrealised losses are also eliminated unless the transaction provides evidence of an impairment of the asset transferred. Accounting policies of associates and joint ventures have been changed where necessary to ensure consistency with the policies adopted by the Group.

2.3.8 Separate financial statement

In the separate financial statements, investments in subsidiaries, associates and joint ventures are accounted for at cost less impairment. Cost is adjusted to reflect changes in consideration arising from contingent consideration amendments. Cost also includes direct attributable costs of investment.

A test for impairment of investments in subsidiaries, associates and joint ventures is carried out when there is a factor indicating that investments might be impaired. If the carrying value of the investments is higher than its recoverable amount, impairment loss is charged to profit or loss.

2.4 Foreign currency translation

2.4.1 Functional and presentation currency

Items included in the financial statements of each of the Group's entities are measured using the currency of the primary economic environment in which the entity operates (the functional currency). The financial statements are presented in Thai Baht, which is the functional currency and presentation currency of the Company.

2.4.2 Transactions and balances

Foreign currency transactions are translated into the functional currency using the exchange rates prevailing at the dates of the transactions. Foreign exchange gains and losses resulting from the settlement of such transactions and from the translation at year-end exchange rates of monetary assets and liabilities denominated in foreign currencies are recognised in the profit or loss.

When a gain or loss on a non-monetary item is recognised in other comprehensive income, any exchange component of that gain or loss is recognised in other comprehensive income. Conversely, when a gain or loss on a non-monetary item is recognised in profit and loss, any exchange component of that gain or loss is recognised in profit and loss.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

2.4.3 Group companies

The results and financial position of all of the Group's entities (none of which has the currency of a hyper-inflationary economy) that have a functional currency different from the presentation currency are translated into the presentation currency as follows:

- Assets and liabilities for each statement of financial position presented are translated at the closing rate at the date of that statement of financial position;
- Income and expenses for each statement of comprehensive income are translated at average exchange rates; and
- All resulting exchange differences are recognised in other comprehensive income.

Goodwill and fair value adjustments arising on the acquisition of a foreign operation are treated as assets and liabilities of the foreign operation and translated at the closing rate.

2.5 Cash and cash equivalents

In the consolidated and separate statements of cash flows, cash and cash equivalents includes cash on hand, deposits held at call with banks, other short-term highly liquid investments with original maturities of three months or less. In the consolidated and separate statements of financial position, bank overdrafts are shown within current liabilities.

2.6 Investments

Investments other than investments in subsidiaries, associates and joint ventures are classified into the following four categories: trading investments; held-to-maturity investments; available-for-sale investments; and general investments. The classification is depended on the purpose for which the investments were acquired. Management determines the appropriate classification of its investments at the time of the purchase and re-evaluates such designation on a regular basis.

1. Investments that are acquired principally for the purpose of generating a profit from short-term fluctuations in price are classified as trading investments and included in current assets.
2. Investments with fixed maturity that the management has the intent and ability to hold to maturity are classified as held-to-maturity.
3. Investments intended to be held for an indefinite period of time, which may be sold in response to liquidity needs or changes in interest rates, are classified as available-for-sale.
4. Investments in non-marketable equity securities are classified as general investments.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

All four categories of investment are initially recognised at cost, which is equal to the fair value of consideration paid plus transaction cost.

Trading investments and available-for-sale investments are subsequently measured at fair value. The unrealised gains and losses of trading investments are recognised in profit or loss. The unrealised gains and losses of available-for-sale investments are recognised in other comprehensive income.

Held-to-maturity investments are carried at amortised cost using the effective yield method less impairment loss.

General investments are carried at cost less impairment loss.

A test for impairment is carried out when there is a factor indicating that an investment might be impaired. If the carrying value of the investment is higher than its recoverable amount, impairment loss is charged to profit or loss.

On disposal of an investment, the difference between the net disposal proceeds and the carrying amount is charged or credited to the profit or loss. When disposing part of the Group's holding of a particular investment in debt or equity securities, the carrying amount of the disposed part is determined by the weighted average carrying amount of the total holding of the investment.

2.7 Trade accounts receivable

Trade accounts receivable are amounts due from customers for goods sold or service performed in the ordinary course of business. Trade accounts receivable are carried at the amount of consideration that is unconditionally and subsequently measured at the remaining amount less any allowance for doubtful accounts based on a review of all outstanding amounts at the year-end. The amount of the allowance is the difference between the carrying amount of the receivable and the amount expected to be collectible. Bad debts are written-off during the year in which they are identified and recognised in profit or loss within selling expenses.

2.8 Inventories

Inventories are stated at the lower of cost and net realisable value. Cost is determined by the weighted average method. The cost of purchase comprises both the purchase price and costs directly attributable to the acquisition of the inventory, such as import duties and transportation charges, less all attributable discounts, allowances or rebates. The cost of finished goods and work in progress comprises raw materials,

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

direct labour, other direct costs and related production overheads based on normal operating capacity. It excludes borrowing costs. Net realisable value is the estimate of the selling price in the ordinary course of business, less applicable variable selling expenses. Allowance is made, where necessary, for obsolete, slow-moving and defective inventories.

2.9 Non-current assets (or disposal groups) held-for-sale

Non-current assets (or disposal groups) are classified as assets held-for-sale when their carrying amount will be recovered principally through a sale transaction and a sale is considered highly probable. They are measured at the lower of the carrying amount and fair value less costs to sell.

An impairment loss is recognised for write-down of the asset (or disposal group) to fair value less costs to sell. A gain is recognised for any subsequent increases in fair value less costs to sell of an asset (or disposal group), but not in excess of any cumulative impairment loss previously recognised.

Non-current assets (including those that are part of a disposal group) are not depreciated or amortised.

2.10 Investment property

Property that is held for long-term rental yields or for capital appreciation or both, and that is not occupied by the companies in the Group, is classified as investment property. Investment property also includes property that is being constructed or developed for future use as investment property. Investment property of the Group is land held for long-term rentals yields.

Land held under operating leases is classified and accounted for by the Group as investment property when the rest of the definition of investment property is met. The operating lease is accounted for as if it were a finance lease.

Investment property is measured initially at its cost, including related transaction costs.

After initial recognition, investment property is carried at cost less any accumulated impairment losses (if any). Land are not depreciated.

Subsequent expenditure is capitalised to the asset's carrying amount only when it is probable that future economic benefits associated with the expenditure will flow to the Group and the cost of the item can be measured reliably. All other repairs and maintenance costs are expensed when incurred. When part of an investment property is replaced, the carrying amount of the replaced part is derecognised.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

2.11 Property, plant and equipment

Property, plant and equipment are stated at historical cost less accumulated depreciation and allowance for impairment (if any). The costs of property, plant and equipment comprise of the purchase price, import duty, non-refundable value added tax (after deducting trade discount and amount returned from seller) and any costs directly attributable to bring the assets to location and condition necessary for them to be capable of operating in the manner intended by management. These costs also include the initial estimated costs of dismantling and removing the item and restoring the site on which they are located, the obligation for which the Group incurs either when the items are acquired or as a consequence of having used the items during a particular period. For equipments controlled by software license which is unable to operate without it. The Group consider it as part of the equipments.

Subsequent costs are included in the asset's carrying amount or recognised as a separate asset, as appropriate, only when it is probable that future economic benefits associated with the item will flow to the Group and the cost of the item can be measured reliably. The carrying amount of the replaced part is derecognised. All other repairs and maintenance are charged to profit or loss during the financial period in which they are incurred.

Land is not depreciated. Depreciation on other assets is calculated using the straight-line method to allocate their cost to their residual values over their estimated useful lives, as follows:

| | <u>Years</u> |
|--|--------------|
| Buildings | 10 - 25 |
| Leasehold improvements | 5 - 20 |
| Refinery plant and equipment | 20 - 35 |
| Lube base oil refinery plants and equipment | 16 - 20 |
| Petrochemical plants | 10 - 25 |
| Power plants | 20 - 25 |
| Transmission facilities | 25 |
| Machinery, equipment and plant equipment | 3 - 20 |
| Oil and liquid chemical tankers and crew boats | 10 - 25 |
| Furniture, fixtures, office equipment and others | 5 - 10 |
| Vehicles | 5 |

The assets' residual values and useful lives are reviewed, and adjusted if appropriate, at the end of each reporting period.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

The asset's carrying amount is written-down immediately to its recoverable amount if the asset's carrying amount is greater than its estimated recoverable amount (Note 2.14).

Gains or losses on disposals are determined by comparing the proceeds with the carrying amount and are recognised within other gains or losses-net in profit or loss.

2.12 Goodwill

Goodwill on acquisitions of subsidiaries (Note 2.3.1) is separately reported in the consolidated statement of financial position.

Goodwill is tested annually for impairment and carried at cost less accumulated impairment losses. Impairment losses on goodwill are not reversed. Gains and losses on the disposal of an entity include the carrying amount of goodwill relating to the entity sold.

Goodwill is allocated to cash-generating units for the purpose of impairment testing. The allocation is made to those cash-generating units or groups of cash-generating units that are expected to benefit from the business combination in which the goodwill arose and can be identified according to operating segment.

2.13 Intangible assets

License fee, computer software and patent

License fee, computer software and patent that are acquired by the Group, which have finite useful lives, are stated at cost less accumulated amortisation and accumulated impairment losses (if any). Amortisation is calculated using the straight-line method to allocate their cost to their residual values over their estimated useful lives as follows:

| | Years |
|-------------------|---------|
| License fee | 10 - 25 |
| Computer software | 5 - 10 |
| Patent | 10 |

Amortisation methods, useful lives and residual values are reviewed at the end of each reporting period.

Cost associated with maintaining computer software are recognised as expense in the period in which they are incurred.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

2.14 Impairment of assets

Assets that have an indefinite useful life, for example goodwill, are not subject to amortisation and are tested for impairment annually. Assets that are subject to amortisation are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. An impairment loss is recognised for the amount by which the carrying amount of the assets exceeds its recoverable amount. The recoverable amount is the higher of an asset's fair value less costs to sell and value in use. For the purposes of assessing impairment, assets are grouped at the lowest level for which there are separately identifiable cash flows. Non-financial assets other than goodwill that suffered an impairment are reviewed for possible reversal of the impairment at each reporting date.

2.15 Leases

Leases - where the Group is the lessee

Long-term leases where a significant portion of the risks and rewards of ownership are retained by the lessor are classified as operating leases. Payments made under operating leases (net of any incentives received from the lessor) are charged to profit or loss on a straight-line basis over the period of the lease.

Long-term leases of assets where the Group has substantially all the risks and rewards of ownership are classified as finance leases. Finance leases are capitalised at the inception of the lease at the lower of the fair value of the leased property and the present value of the minimum lease payments.

Each lease payment is allocated between the liability and finance charges so as to achieve a constant rate on the finance balance outstanding. The corresponding rental obligations, net of finance charges, are included in other long-term payables. The interest element of the finance cost is charged to profit or loss over the lease period so as to achieve a constant periodic rate of interest on the remaining balance of the liability for each period. The property, plant or equipment acquired under finance leases is depreciated over the shorter period of the useful life of the asset and the lease term.

Leases - where the Group is the lessor

When assets are leased out under a finance lease, the present value of the lease payments is recognised as a receivable. The difference between the gross receivable and the present value of the receivable is recognised as unearned finance income. Lease income is recognised over the term of the lease using the net investment method, which reflects a constant periodic rate of return. Initial direct costs are included in initial measurement of the finance lease receivable and reduce the amount of income recognised over the lease term.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Assets leased out under operating leases are included in property, plant and equipment in the statement of financial position. They are depreciated over their expected useful lives on a basis consistent with other similar property, plant and equipment owned by the Group. Rental income (net of any incentives given to lessees) is recognised on a straight-line basis over the lease term.

2.16 Borrowings

Borrowings are recognised initially at the fair value, net of transaction costs incurred. Borrowings are subsequently stated at amortised cost. Any difference between proceeds (net of transaction costs) and the redemption value is recognised in profit or loss over the period of the borrowings using the effective yield method.

Fees paid on the establishment of loan facilities are recognised as transaction costs of the loan to the extent that it is probable that some or all of the facility will be drawdown. In this case, the fee is deferred until the draw-down occurs. To the extent that there is no evidence that it is probable that some or all of the facility will be drawn-down, the fee is capitalised as a pre-payment for liquidity services and amortised over the period of the facility to which it relates.

Borrowings are classified as current liabilities unless the Group has an unconditional right to defer settlement of the liability for at least 12 months after the end of reporting date.

Borrowing costs

General and specific borrowing costs directly attributable to the acquisition, construction or production of qualifying assets are included in the cost of assets. Qualifying assets are assets that require a substantial period of time to get assets to be ready for their intended use or sale. The borrowing cost can be capitalised until the assets are substantially ready for their intended use or sale.

Investment income earned on the temporary investment of specific borrowings in which the specific borrowing does not include as an expenditure of the qualifying assets is deducted from the borrowing costs.

All other borrowing costs are recognised as expense in the period in which they are incurred.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

2.17 Current and deferred income taxes

The tax expense for the period comprises current and deferred tax. Tax is recognised in profit or loss, except to the extent that it relates to items recognised in other comprehensive income or directly in equity. In this case the tax is also recognised in other comprehensive income or directly in equity, respectively.

The current income tax charge is calculated on the basis of the tax laws enacted or substantially enacted at the end of reporting period in the countries where the Company and its subsidiaries operate and generate taxable income. Management periodically evaluates positions taken in tax returns with respect to situations in which applicable tax regulation is subject to interpretation and establishes provisions where appropriate on the basis of amounts expected to be paid to the tax authorities.

Deferred income tax is recognised, using the liability method, on temporary differences arising from differences between the tax base of assets and liabilities and their carrying amounts in the financial statements.

However, the deferred income tax is not accounted for if it arises from initial recognition of an asset or liability in a transaction other than a business combination that at the time of the transaction affects neither accounting nor taxable profit or loss. Deferred income tax is determined using tax rates (and laws) that have been enacted or substantially enacted by the end of the reporting period and are expected to apply when the related deferred income tax asset is realised or the deferred income tax liability is settled.

Deferred income tax assets are recognised only to the extent that it is probable that future taxable profit will be available against which the temporary differences can be utilised. Deferred income tax is provided on temporary differences arising from investments in subsidiaries, associates and joint arrangements, except where the timing of the reversal of the temporary difference is controlled by the Group and it is probable that the temporary difference will not reverse in the foreseeable future.

Deferred income tax assets and liabilities are offset when there is a legally enforceable right to offset current tax assets against current tax liabilities and when the deferred income tax assets and liabilities relate to income taxes levied by the same tax authority on either the same taxable entity or different taxable entities where there is an intention to settle the balances on a net basis.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

2.18 Employee benefits

2.18.1 Defined contribution

A defined contribution plan is a plan under which the Group pays fixed contributions into a separate entity. The Group has no legal or constructive obligations to pay further contributions if the fund does not hold sufficient assets to pay all employees the benefits relating to employee service in the current and prior periods. The Group pays contributions to a separate fund which is managed by an external fund manager in accordance with the Provident Fund Act. B.E. 2530. The contributions are recognised as an employee benefit expense when they are due. Prepaid contributions are recognised as an asset to the extent that a cash refund or a reduction in the future payments is available.

2.18.2 Retirement benefits

A defined benefit plan is a retirement plan that is not a defined contribution plan. Typically defined benefit plans define an amount of retirement benefit that an employee will receive on retirement, usually depends on one or more factors such as age, years of service and compensation.

The liability recognised in the statement of financial position in respect of defined benefit retirement plans is the present value of the defined benefit obligation at the end of the reporting period. The defined benefit obligation is calculated by independent actuaries using the projected unit credit method. The present value of the defined benefit obligation is determined by discounting the estimated future cash outflows using market yield of government bonds that are denominating in the currency in which the benefits will be paid, and that have terms to maturity approximating to the terms of the related retirement liability.

Remeasurement gains and losses arising from experience adjustments and changes in actuarial assumptions are charged or credited to equity in other comprehensive income in the period in which they arise. They are included in retained earnings in the statements of changes in equity.

Past-service costs are recognised immediately in profit or loss.

2.18.3 Other long-term employee benefits

The Group's net obligation in respect of long-term employee benefits is the amount of future benefit that employees have earned in return for their service in the current and prior periods. That benefit is discounted cash flow to determine its present value. Remeasurements are recognised in profit or loss in the period in which they arise.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

2.18.4 Termination benefits

Termination benefits are payable when employment is terminated by the Group before the normal retirement date, or whenever an employee accepts voluntary redundancy in exchange for these benefits. The Group recognises termination benefits at the earlier of the following dates: (a) when the Group can no longer withdraw the offer of those benefits; and (b) when the entity recognises costs for a restructuring that is within scope of TAS 37 and involves the payment of termination benefits. In the case of an offer made to encourage voluntary redundancy, the termination benefits are measured based on the number of employees expected to accept the offer. Benefits due more than 12 months after the end of the reporting period are discounted to their present value.

2.18.5 Short-term employee benefits

Short-term employee benefits are expensed as the related service is provided. A liability is recognised for the amount expected to be paid if the Group has a present legal or constructive obligation to pay this amount as a result of past service provided by the employee and the obligation can be estimated reliably.

2.19 Provision

Provisions are recognised when the Group has a present legal or constructive obligation as a result of past events, it is probable that an outflow of resources will be required to settle the obligation, and the amount has been reliably estimated. Where the Group expects a provision to be reimbursed, the reimbursement is recognised as a separate asset, but only when the reimbursement is virtually certain.

Provisions are measured at the present value of the expenditures expected to be required to settle the obligation using a pre-tax rate that reflects current market assessments of the time value of money and the risks specific to the obligation. The increase in the provision due to passage of time is recognised as interest expense.

2.20 Share capital

Ordinary shares with discretionary dividends are classified as equity.

Incremental costs directly attributable to the issue of new shares are shown in equity as a deduction, net of tax, from the proceeds.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

2.21 Revenue recognition

Revenue include all revenues from ordinary business activities. All ancillary income in connection with the delivery of goods and rendering of services in the course of the Group's ordinary activities is also presented as revenue.

Revenue are recorded net of value added tax. They are recognised in accordance with the provision of goods or services, provided that collectibility of the consideration is probable.

Multiple element arrangements involving delivery or provision of multiple products or services are separated into distinct performance obligations. Total transaction price of the bundled contract is allocated to each performance obligation based on their relative standalone selling prices or estimated standalone selling prices. Each performance obligation is recognised as revenue on fulfillment of the obligation to the customer.

Sales of goods

Revenue from contracts with customers that is derived in connection with oil refinery, lube base oil refinery, petrochemical, power generation, solvent and ethanol business is recognised when the Group satisfies a performance obligation by transferring the petroleum products, petrochemical products and other products to customers via vessel, truck, or pipeline. A transfer of goods generally occurs at the same time when legal ownerships are transferred to customers and customers have physical goods in their possession. In that case, the Group satisfies a performance obligation at a point in time.

Revenue from services

Revenue from services is mainly derived from marine transportation services and is recognised when service is performed. The Group satisfies a performance obligation over time.

Rental income

Rental income from investment property is recognised in profit or loss on a straight-line basis over the term of the lease. Lease incentives granted are recognised as an integral part of the total rental income. Contingent rentals are recognised as income in the accounting period in which they are earned.

Interest and dividend income

Interest income is recognised in the profit or loss as it accrues. Dividend income is recognised in the profit or loss on the date the Group's right to receive payments is established which in the case of quoted securities is usually the ex-dividend date.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

2.22 Government grants

Grants from the government are recognised at their fair value where there is a reasonable assurance that the grant will be received and the Group will comply with all attached conditions.

Government grants relating to income are deferred and recognised in profit or loss as subsidy over the period necessary to match them with the costs they are intended to compensate.

The Group separately presents government grants from revenue from sales.

2.23 Dividend distribution

Dividend distribution to the Company's shareholders is recognised as a liability in the Group's financial statements in the period in which the dividends are approved by the Company's shareholders. Interim dividends are recognised when they are approved by the Board of Directors.

2.24 Segment reporting

Operating segments are reported in a manner consistent with the internal reporting provided to the chief operating decision-maker. The chief operating decision-maker, who is responsible for allocating resources and assessing performance of the operating segments, has been identified as President and Chief Executive Officer who make strategic decisions.

3 Financial risk management

3.1 Financial risk factors

The Group is exposed to normal business risks from changes in market interest rates and currency exchange rates and from non-performance of contractual obligation by counterparties. The Group does not hold or issue derivative financial instruments for speculative or trading purposes.

Risk management is integral to the whole business of the Group. The Group has a control system in place to create an acceptable balance between the cost of risks occurring and the cost of managing the risks. The management continually monitors the Group's risk management process to ensure that an appropriate balance between risk and control is achieved.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

3.1.1 Foreign exchange risk

The Group is exposed to foreign exchange risk relating to purchase of raw materials, long-term loans and debentures which are denominated in foreign currencies. However, the Group enters into short-term currency hedging contracts for short-term foreign currency exposures to protect the foreign exchange risk when appropriate.

As at 31 December 2019 and 2018, the Group was exposed to foreign currency risk in respect of financial assets and liabilities denominated in the following currencies:

| | (Million Baht) | | | |
|--|--------------------------------------|-----------------|----------------------------------|-----------------|
| | Consolidated financial statements | | Separate financial statements | |
| | 2019 | 2018 | 2019 | 2018 |
| US Dollars | | | | |
| Cash and cash equivalents | 53,162 | 17,548 | 52,250 | 17,062 |
| Short-term investments | 1,757 | 39,076 | 1,757 | 39,076 |
| Trade accounts receivable | 1,808 | 3,004 | 481 | 983 |
| Other receivables | 19 | 165 | 16 | 162 |
| Loans and debentures | (142,820) | (64,706) | (77,252) | (64,706) |
| Trade accounts payable | (6,834) | (4,425) | (6,635) | (4,128) |
| Other payables | (4,924) | (1,016) | (4,013) | (104) |
| | (97,832) | (10,354) | (33,396) | (11,655) |
| Other currencies | | | | |
| Cash and cash equivalents | 86 | 38 | - | - |
| Trade accounts receivable | 384 | 327 | - | - |
| Other receivables | 27 | 18 | - | 4 |
| Loans | (480) | (576) | - | - |
| Trade accounts payable | (34) | (13) | - | - |
| Other payables | (1,561) | (98) | (1,532) | (15) |
| | (1,578) | (304) | (1,532) | (11) |
| Gross exposure in the statement of financial position | (99,410) | (10,658) | (34,928) | (11,666) |
| Currency forwards contracts | 3,296 | 2,806 | 3,296 | 2,806 |
| Net exposure | (96,114) | (7,852) | (31,632) | (8,860) |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

3.1.2 Interest rate risk

Interest rate risk is the risk that future movements in market interest rates will affect the results of the Group's operations and its cash flows. Hence, the Group has entered into hedging agreements with various investment-grade financial institutions to protect against the risk of rising interest rates.

The effective interest rates of loans as at 31 December 2019 and 2018 and the periods in which those assets mature were as follows:

(Million Baht)

| | Consolidated financial statements | | | |
|----------------------------|--|---------------|--------------|-------|
| | Effective interest rate % per annum | Within 1 year | After 1 year | Total |
| As at 31 December 2019 | | | | |
| Non-current | | | | |
| Long-term loans to savings | | | | |
| co-operative of employees | MLR less fixed margin | 32 | 526 | 558 |
| Loans to employees | MMR less fixed margin | - | 6 | 6 |
| Total | | 32 | 532 | 564 |
| As at 31 December 2018 | | | | |
| Non-current | | | | |
| Long-term loans to savings | | | | |
| co-operative of employees | MLR less fixed margin | 34 | 538 | 572 |
| Loans to employees | MMR less fixed margin | 1 | 6 | 7 |
| Total | | 35 | 544 | 579 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

(Million Baht)

| | Separate financial statements | | | |
|---|--|---------------|---------------|---------------|
| | Effective interest rate % per annum | Within 1 year | After 1 year | Total |
| As at 31 December 2019 | | | | |
| Current | | | | |
| Short-term loans to subsidiaries | BIBOR 3 M plus fixed margin | 3,221 | - | 3,221 |
| Non-current | | | | |
| Long-term loans to subsidiaries | BIBOR 3 M plus fixed margin | - | 11,781 | 11,781 |
| Long-term loans to savings co-operative of employees | MLR less fixed margin | 32 | 526 | 558 |
| Total | | 3,253 | 12,307 | 15,560 |
| As at 31 December 2018 | | | | |
| Current | | | | |
| Short-term loans to subsidiaries | BIBOR 3 M plus fixed margin | 4,274 | - | 4,274 |
| Non-current | | | | |
| Long-term loans to subsidiaries | BIBOR 3 M plus fixed margin | - | 400 | 400 |
| Long-term loans to savings co-operative of employees | MLR less fixed margin | 34 | 538 | 572 |
| Total | | 4,308 | 938 | 5,246 |

The effective interest rates of loans from financial institutions and debentures as at 31 December 2019 and 2018 and the periods in which those liabilities mature were disclosed in note 23 and note 24, respectively.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

3.1.3 Credit risk

Credit risk is the potential financial loss resulting from the failure of a customer or counterparty to settle its financial and contractual obligations to the Group as and when they fall due. The Group has no significant credit risk with any single counterparty or group of counterparties since the Group maintains business with large customers in petroleum and power industries and requires first class collateral for the rest.

3.1.4 Liquidity risk

The Group manages and monitors its liquidity risk by maintaining an adequate level of cash and cash equivalents to finance the Group's operations and to mitigate the effects of fluctuations in cash flows.

3.2 Accounting for derivatives financial instruments

Derivative are used to manage exposure to foreign exchange, interest rate and commodity price risks arising from operational, financing and investment activities. Derivative are not used for trading purposes. However, derivatives that do not qualify for hedge accounting are accounted for as trading instruments.

Hedge of future foreign currency transactions

Forward foreign exchange contracts protect the Group from fluctuations in exchange rates by establishing the rates at which foreign currency assets will be realised or foreign currency liabilities will be settled. Forward foreign exchange contracts are recognised in the financial statements at inception. The premium or discount on the establishment of each agreement is amortised over the contract period.

Cross currency swap and interest rate swap contracts

Cross currency swap and interest rate swap contracts use to hedge the future fluctuations in exchange rates and interest rates. Financial assets and liabilities denominated in foreign currencies are hedged by using the cross currency swap contracts and are translated into the functional currency at the foreign exchange rates determined in the contracts and revalued at the reporting date at the foreign exchange rate ruling on that date. Foreign exchange differences are recognised in profit or loss. The differences under interest rate swaps are recorded as adjustments to the interest expense relating to the financial obligations in profit or loss.

Hedge of oil price crack spread and time spread

Differences between the fixed prices of contracts and the settlement prices are recognised in the profit or loss in the period in which the contracts mature.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

3.3 Fair value estimation of financial instruments

The different levels have been defined as follows:

- Level 1: Quoted prices (unadjusted) in active markets for identical assets or liabilities.
- Level 2: Inputs other than quoted prices included within level 1 that are observable for the asset or liability, either directly (that is, as prices) or indirectly (that is, derived from prices).
- Level 3: Inputs for the asset or liability that are not based on observable market data (that is, unobservable inputs).

The fair value of current portion of financial assets and liabilities approximate the carrying value due to the relatively short-term maturity of these financial instruments.

The carrying value of long-term loans and borrowings with a floating interest rates approximate their fair value because the floating rates are determined by the rate in the market.

The following table presents the Group's financial instruments other than stated above that are measured at fair value and are not measured at fair value and classified into the different fair value levels as of 31 December 2019 and 2018.

| (Million Baht) | | | | |
|---|-----------------------------------|-----------|---------|-----------|
| As at 31 December 2019 | Consolidated financial statements | | | |
| | Level 1 | Level 2 | Level 3 | Total |
| Financial assets estimated at fair value | | | | |
| Equity securities - available-for-sale securities | 383 | - | - | 383 |
| Financial assets and financial liabilities not estimated at fair value | | | | |
| Debentures | - | (108,498) | - | (108,498) |
| Oil price crack spread swap and time spread swap | - | 137 | - | 137 |
| Interest rate swap contracts | - | (413) | - | (413) |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

(Million Baht)

| As at 31 December 2018 | Consolidated financial statements | | | |
|---|-----------------------------------|----------|---------|----------|
| | Level 1 | Level 2 | Level 3 | Total |
| Financial assets estimated at fair value | | | | |
| Equity securities - available-for-sale securities | 361 | - | - | 361 |
| Debt securities - available-for-sale securities (Private funds) | - | 11,903 | - | 11,903 |
| Financial assets and financial liabilities not estimated at fair value | | | | |
| Debt securities held to maturity | - | 721 | - | 721 |
| Debentures | - | (89,035) | - | (89,035) |
| Forward exchange contracts | - | (9) | - | (9) |
| Oil price crack spread swap and time spread swap | - | (278) | - | (278) |
| Interest rate swap contracts | - | (112) | - | (112) |

(Million Baht)

| As at 31 December 2019 | Seperate financial statements | | | |
|---|-------------------------------|----------|---------|----------|
| | Level 1 | Level 2 | Level 3 | Total |
| Financial assets estimated at fair value | | | | |
| Equity securities - available-for-sale securities | 383 | - | - | 383 |
| Financial assets and financial liabilities not estimated at fair value | | | | |
| Long-term loans | - | (73,011) | - | (73,011) |
| Debentures | - | (35,748) | - | (35,748) |
| Oil price crack spread swap and time spread swap | - | 124 | - | 124 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

(Million Baht)

| As at 31 December 2018 | Seperate financial statements | | | Total |
|---|-------------------------------|----------|---------|----------|
| | Level 1 | Level 2 | Level 3 | |
| Financial assets estimated at fair value | | | | |
| Equity securities - available-for-sale securities | 361 | - | - | 361 |
| Debt securities - available-for-sale securities | | | | |
| (Private funds) | - | 11,903 | - | 11,903 |
| Financial assets and financial liabilities | | | | |
| not estimated at fair value | | | | |
| Debt securities held to maturity | - | 721 | - | 721 |
| Long-term loans | - | (51,652) | - | (51,652) |
| Debentures | - | (37,624) | - | (37,624) |
| Forward exchange contracts | - | (9) | - | (9) |
| Oil price crack spread swap and | | | | |
| time spread swap | - | (33) | - | (33) |

Valuation techniques

Valuation techniques used in measuring level 2 fair values.

| Type | Valuation technique |
|---|--|
| Debt securities - available-for-sale securities (Private funds) | Thai Bond Market Association Government Bond Yield Curve as of the reporting date. |
| Debentures/ Long-term loans | Market comparison technique: The valuation model is based on ask prices or lastest price of comparable market securities. |
| Oil price crack spread swap and time spread swap/ Cross currency and interest rate swap contracts/ Interest rate swap contracts | Market comparison technique: The fair values are based on broker quotes. Similar contracts are traded in an active market and the quotes reflect the actual transactions in similar instruments. |

The Group did not have any transfers between levels 1 and 2 during the year.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

4 Critical accounting estimates and judgements

Estimates and judgements are continually evaluated and are based on historical experience and other factors, including expectations of future events that are believed to be reasonable under the circumstances.

Critical accounting estimates and assumptions

During the year ended 31 December 2019, the Group makes estimates and assumptions concerning the future. The result of accounting estimates will, by definition, seldom equal the related actual results. The estimates and assumptions that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year are outlined below.

4.1 Estimated impairment of goodwill

The Group performs an impairment test of goodwill annually, in accordance with the accounting policy stated in note 2.12. The recoverable amounts of cash-generating units have been determined based on value-in-use calculations. The value-in-use calculation requires the management to estimate the future cash flows expected to arise from the cash-generating unit in order to calculate present value. Significant estimates and assumptions used are growth rate and discount rate which reflect risk of the particular cash-generating unit (Note 17). Determination of the assumptions is necessary for the goodwill impairment testing.

4.2 Impairment of property, plant and equipment

The Group tests impairment of property, plant and equipment whenever events or changes in circumstances indicate that the carrying amount of asset is greater than its estimated recoverable amount. Recoverable amount is the higher of fair value less costs to sell and its value in use. The calculation of fair value less costs to sell involves significant judgements and assumptions of the management in respect to characteristics and conditions of individual asset, expected disposal period, including the list of total assets expected to be disposed. The value-in-use calculates from a cash flow projection which approved by managements. Those cash flows are determined by annual earnings before interest, taxes, depreciation, and amortisation (EBITDA) estimated by management, adjusted by corporate income tax, change in working capital and capital expenditures considered necessary. A long-term growth rate has been determined with reference to gross domestic product (GDP) growth rates for the countries in which the CGUs operates and experiences by management.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

4.3 Impairment of investment in subsidiaries

The Group tests impairment of investments in subsidiaries whenever events or changes in circumstances indicate that the carrying amount of asset is greater than its estimated recoverable amount which calculated by using value-in-use method. Value in use involves the future operating results of business, projected cash flows, discount rate to be applied to the projected cash flows and projected dividend payouts of subsidiaries.

4.4 Fair value of derivatives and other financial instruments

The fair value of financial instruments that are not traded in an active market (for example, over-the-counter derivatives) is determined by using valuation techniques. The Group uses its judgement to select a variety of methods and make assumptions that are mainly based on market conditions exist at the end of each reporting period as disclosed in note 3.3.

4.5 Retirement benefits

The present value of the retirement benefits obligations depends on a number of factors that are determined on an actuarial basis using a number of assumptions including the discount rate. Any changes in these assumptions will have an impact on the carrying amount of retirement benefits obligation.

The Group determines the appropriate discount rate at the end of each year. This is the interest rate that should be used to determine the present value of estimated future cash outflows expected to be required to settle the retirement benefits obligations. In determining the appropriate discount rate, the Group considers the market yield of government bonds that are denominated in the currency in which the benefits will be paid, and that have terms to maturity approximating the terms of the related retirement benefits liability.

Additional information of other key assumptions for retirement benefits obligations is disclosed in note 25.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

5 Capital risk management

The objectives of the Group's capital management are to safeguard the Group's ability to continue as a going concern in order to provide returns to the Group's shareholders and benefits to other stakeholders. The management sets strategies to support the Group's operations for more efficiency, and better performances and stronger financial status, including dividend and capital management policies to maintain the optimal capital structure and cost of capital.

6 Segment information

Segment information is presented in respect of the Group's business segments. The primary format, business segments, is based on the Group's management and the internal reporting structure provided to the chief operating decision maker.

Segment results, assets and liabilities include items directly attributable to a segment as well as those that can be allocated on a reasonable basis.

Reportable segments

The Group comprises the following main business segments:

| | |
|------------|--------------------------------|
| Segment 1: | Oil refinery |
| Segment 2: | Lube base oil refinery |
| Segment 3: | Petrochemical |
| Segment 4: | Power generation |
| Segment 5: | Marine transportation services |
| Segment 6: | Solvent |
| Segment 7: | Ethanol |
| Segment 8: | Others |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Assets, revenue, and profit (loss) from operation of the business in consolidated financial statements for the year ended 31 December 2019 and 2018 are as follows:

| | For the year ended 31 December 2019 | | | | | | | | (Million Baht) |
|--|-------------------------------------|------------------------|----------------|------------------|--------------------------------|------------|-----------|--------------------|-----------------------|
| | Oil refinery | Lube base oil refinery | Petro-chemical | Power generation | Marine transportation services | Solvent | Ethanol | Others Elimination | Total |
| Revenue from sales and services | | | | | | | | | |
| - External | 314,333 | 13,755 | 18,801 | 4,970 | 411 | 9,000 | 909 | - | 362,179 |
| - Inter-segment | 61,067 | 4,488 | 33,397 | 6,800 | 249 | 102 | 564 | 4,295 | (110,962) |
| Subsidy from oil fuel fund | 2,147 | - | - | - | - | - | - | - | 2,147 |
| Cost of sales and services | (374,844) | (16,803) | (51,357) | (10,089) | (654) | (8,282) | (1,374) | (4,055) | 111,702 (355,756) |
| Gross profit | 2,703 | 1,440 | 841 | 1,681 | 6 | 820 | 99 | 240 | 740 8,570 |
| Dividend income | 2,494 | - | - | - | - | - | - | - | 167 |
| Net derivative gain (loss) on hedging instruments | (210) | - | 569 | - | - | - | - | - | 359 |
| Net foreign exchange gain (loss) | 1,847 | 1 | 22 | 4 | (3) | (106) | 2 | 8 | 1,775 |
| Other income | 3,467 | 83 | 316 | 31 | 26 | 19 | 3 | 1 | 1,577 |
| Selling expenses | (60) | (106) | (166) | - | - | (285) | (19) | - | (405) |
| Administrative expenses | (2,398) | (80) | (164) | (28) | (163) | (309) | (60) | (48) | (2,279) |
| Share of profit (loss) of joint ventures and associates, net | - | - | - | 844 | 29 | - | (9) | - | 1,299 |
| Profit (loss) before finance costs and income tax expense | 7,843 | 1,338 | 1,418 | 2,532 | (105) | 139 | 16 | 201 | (2,319) 11,063 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

| | For the year ended 31 December 2019 | | | | | | | | | (Million Baht) |
|---|-------------------------------------|------------------------|----------------|------------------|--------------------------------|---------|---------|--------|-------------|----------------|
| | Oil refinery | Lube base oil refinery | Petro-chemical | Power generation | Marine transportation services | Solvent | Ethanol | Others | Elimination | Total |
| Finance costs | (2,661) | (4) | (297) | (452) | (112) | (85) | (18) | - | 322 | (3,307) |
| Profit (loss) before income tax expense | 5,182 | 1,334 | 1,121 | 2,080 | (217) | 54 | (2) | 201 | (1,997) | 7,756 |
| Income tax benefit (expense) | (527) | (267) | (244) | (121) | 1 | (31) | - | (10) | (41) | (1,240) |
| Net profit (loss) for the year | 4,655 | 1,067 | 877 | 1,959 | (216) | 23 | (2) | 191 | (2,038) | 6,516 |
| Profit (loss) attributable to: | | | | | | | | | | |
| - Owners of the parent | 4,655 | 1,067 | 910 | 1,959 | (216) | 25 | (10) | 191 | (2,305) | 6,276 |
| - Non-controlling interests | - | - | (33) | 267 | - | (2) | 8 | - | - | 240 |
| Net profit (loss) for the year | 4,655 | 1,067 | 877 | 2,226 | (216) | 23 | (2) | 191 | (2,305) | 6,516 |
| Recognition of revenue | | | | | | | | | | |
| - Point in time | 4,655 | 1,067 | 877 | 2,226 | - | 23 | (2) | 191 | (2,305) | 6,732 |
| - Over time | - | - | - | - | (216) | - | - | - | - | (216) |
| Total revenue | 4,655 | 1,067 | 877 | 2,226 | (216) | 23 | (2) | 191 | (2,305) | 6,516 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

| | For the year ended 31 December 2018 | | | | | | | | (Million Baht) |
|--|-------------------------------------|------------------------|----------------|------------------|--------------------------------|------------|-----------|--------------------|----------------|
| | Oil refinery | Lube base oil refinery | Petro-chemical | Power generation | Marine transportation services | Solvent | Ethanol | Others Elimination | Total |
| Revenue from sales and services | | | | | | | | | |
| - External | 329,762 | 15,671 | 27,583 | 4,839 | 354 | 9,851 | 983 | - | 389,043 |
| - Inter-segment | 75,067 | 5,288 | 39,118 | 6,895 | 267 | 141 | 494 | 1,925 | (129,195) |
| Subsidy from oil fuel fund | 3,123 | - | - | - | - | - | - | - | 3,123 |
| Cost of sales and services | (401,030) | (19,533) | (62,776) | (9,795) | (616) | (9,193) | (1,381) | (1,846) | (375,950) |
| Gross profit | 6,922 | 1,426 | 3,925 | 1,939 | 5 | 799 | 96 | 79 | 16,216 |
| Dividend income | 4,258 | - | - | - | - | - | - | (4,101) | 157 |
| Net derivative loss on hedging instruments | (237) | - | (584) | - | - | - | - | - | (821) |
| Net foreign exchange gain | 430 | 14 | 159 | 3 | 10 | 11 | - | - | 627 |
| Other income | 3,705 | 87 | 299 | 26 | 45 | 16 | 6 | 2 | 1,719 |
| Selling expenses | (73) | (97) | (207) | - | - | (291) | (19) | - | (424) |
| Administrative expenses | (2,436) | (76) | (118) | (34) | (122) | (279) | (77) | (40) | (2,358) |
| Share of profit of joint ventures and associates, net | - | - | - | 997 | 118 | - | 15 | - | 1,193 |
| Profit (loss) before finance costs and income tax expense | 12,569 | 1,354 | 3,474 | 2,931 | 56 | 256 | 21 | 41 | 16,309 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

| | For the year ended 31 December 2018 | | | | | | | | | | (Million Baht) |
|--|-------------------------------------|------------------------------|--------------------|--------------------------|---|------------|----------|-----------|----------------|---------------|----------------|
| | Oil refinery | Lube base oil refinery | Petro- chemical | Power gen- eration | Marine trans- portation services | Solvent | Ethanol | Others | Elimination | Total | |
| Finance costs | (3,374) | (4) | (409) | (321) | (123) | (76) | (17) | - | 382 | (3,942) | |
| Profit (loss) before income tax expense | 9,195 | 1,350 | 3,065 | 2,610 | (67) | 180 | 4 | 41 | (4,011) | 12,367 | |
| Income tax benefit (expense) | (955) | (271) | (581) | (140) | 1 | (40) | - | 3 | - | (1,983) | |
| Net profit (loss) for the year | 8,240 | 1,079 | 2,484 | 2,470 | (66) | 140 | 4 | 44 | (4,011) | 10,384 | |
| Profit (loss) attributable to: | | | | | | | | | | | |
| - Owners of the parent | 8,240 | 1,079 | 2,530 | 2,470 | (43) | 123 | 4 | 44 | (4,298) | 10,149 | |
| - Non-controlling interests | - | - | (46) | 287 | (23) | 17 | - | - | - | 235 | |
| Net profit (loss) for the year | 8,240 | 1,079 | 2,484 | 2,757 | (66) | 140 | 4 | 44 | (4,298) | 10,384 | |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

| | For the year ended 31 December 2019 | | | | | | | | | | (Million Baht) |
|--|-------------------------------------|------------------------|----------------|------------------|--------------------------------|--------------|--------------|---------------|------------------|----------------|----------------|
| | Oil refinery | Lube base oil refinery | Petro-chemical | Power generation | Marine transportation services | Solvent | Ethanol | Others | Elimination | Total | |
| Trade accounts receivable | 23,634 | 1,022 | 3,950 | 1,438 | 61 | 1,249 | 98 | 850 | (9,836) | 22,466 | |
| Inventories | 26,657 | 1,314 | 1,298 | 163 | 27 | 568 | 291 | - | (26) | 30,292 | |
| Other current assets | 80,257 | 1,935 | 1,928 | 2,039 | 141 | 911 | 53 | 1,056 | (6,401) | 81,919 | |
| Investments in subsidiaries | 15,015 | - | - | - | - | - | - | - | (15,015) | - | |
| Investments in joint ventures | - | - | - | - | 617 | - | - | - | - | 617 | |
| Investments in associates | 7,852 | - | - | 21,769 | 3 | - | 810 | - | 2,008 | 32,442 | |
| Long-term loans to a related party | 11,781 | - | - | - | - | - | - | 76,123 | (87,904) | - | |
| Property, plant and equipment | 68,321 | 1,275 | 18,093 | 11,020 | 2,498 | 2,190 | 1,362 | - | 1,800 | 106,559 | |
| Other non-current assets | 7,354 | 633 | 1,786 | 100 | 8 | 1,307 | 11 | 711 | (2,760) | 9,150 | |
| Total assets | 240,871 | 6,179 | 27,055 | 36,529 | 3,355 | 6,225 | 2,625 | 78,740 | (118,134) | 283,445 | |
| Trade accounts payable | 27,134 | 863 | 4,556 | 781 | 46 | 613 | 48 | 779 | (9,805) | 25,015 | |
| Short-term loans | 2,468 | - | 3,157 | - | 534 | 777 | 331 | 256 | (5,947) | 1,576 | |
| Current portion of long-term loans from financial institutions | - | - | 536 | 312 | 179 | 254 | 55 | - | - | 1,336 | |
| Other current liabilities | 9,949 | 254 | 510 | 223 | 54 | 116 | 47 | 80 | (494) | 10,739 | |
| Long-term loans | 65,366 | - | 4,522 | 22,989 | 1,680 | 654 | 39 | 11,128 | (88,275) | 18,103 | |
| Debentures | 32,129 | - | - | - | - | - | - | 65,055 | - | 97,184 | |
| Other non-current liabilities | 5,104 | 44 | 247 | 96 | 60 | 81 | 14 | 693 | (771) | 5,568 | |
| Total liabilities | 142,150 | 1,161 | 13,528 | 24,401 | 2,553 | 2,495 | 534 | 77,991 | (105,292) | 159,521 | |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

(Million Baht)

| For the year ended 31 December 2018 | | | | | | | | | |
|--|----------------|------------------------|----------------|------------------|--------------------------------|--------------|--------------|---------------|----------------|
| | Oil refinery | Lube base oil refinery | Petro-chemical | Power generation | Marine transportation services | Solvent | Ethanol | Others | Total |
| Trade accounts receivable | 25,194 | 1,547 | 5,098 | 1,482 | 55 | 1,491 | 114 | 697 | 24,359 |
| Inventories | 24,423 | 1,865 | 1,347 | 113 | 33 | 738 | 245 | - | 28,738 |
| Other current assets | 110,899 | 809 | 2,170 | 2,506 | 204 | 990 | 92 | 203 | 111,645 |
| Investments in subsidiaries | 14,555 | - | - | - | - | - | - | - | - |
| Investments in joint ventures | - | - | - | - | 625 | - | - | - | 625 |
| Investments in associates | 1,261 | - | - | 9,115 | - | - | 819 | - | 14,316 |
| Property, plant and equipment | 39,990 | 1,301 | 18,609 | 11,753 | 2,707 | 2,341 | 1,366 | - | 79,929 |
| Other non-current assets | 7,523 | 639 | 1,910 | 84 | 7 | 1,366 | 7 | 52,223 | 9,001 |
| Total assets | 223,845 | 6,161 | 29,134 | 25,053 | 3,631 | 6,926 | 2,643 | 53,123 | 268,613 |
| Trade accounts payable | 23,517 | 1,362 | 5,419 | 1,514 | 31 | 640 | 39 | 626 | 21,844 |
| Current portion of long-term loans from financial institutions | - | - | 535 | 288 | 150 | 535 | 40 | - | 1,548 |
| Current portion of debentures | 3,000 | - | - | - | - | - | - | - | 3,000 |
| Other current liabilities | 9,897 | 715 | 4,706 | 144 | 456 | 1,435 | 426 | 106 | 11,627 |
| Long-term loans from financial institutions | 52,028 | - | 5,054 | 7,921 | 1,459 | 589 | 32 | - | 15,055 |
| Debentures | 33,009 | - | - | - | - | - | - | 51,793 | 85,065 |
| Other non-current liabilities | 3,708 | 46 | 256 | 17 | 477 | 62 | 12 | 442 | 4,002 |
| Total liabilities | 125,159 | 2,123 | 15,970 | 9,884 | 2,573 | 3,261 | 549 | 52,967 | 142,141 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Major customer

Revenue from two customers represents Baht 235,580 million (2018: revenue from three customers represented Baht 242,664 million) of the Group's revenue from sales and service.

Geographical segments

In presenting information on the basis of geographical segments, segment revenue is based on the geographical location of customers and segment assets are based on the geographical location of the assets.

Geographical information

(Million Baht)

| | Revenue | | Non-current assets | |
|-----------------|--------------------------------|----------------|--------------------|----------------|
| | For the year ended 31 December | | As at 31 December | |
| | 2019 | 2018 | 2019 | 2018 |
| Thailand | 334,593 | 344,949 | 147,362 | 102,794 |
| Other countries | 29,733 | 47,217 | 1,406 | 1,075 |
| Total | 364,326 | 392,166 | 148,768 | 103,869 |

7 Cash and cash equivalents

(Million Baht)

| As at 31 December | Consolidated financial statements | | Separate financial statements | |
|---|--------------------------------------|---------------|----------------------------------|---------------|
| | 2019 | 2018 | 2019 | 2018 |
| Cash on hand | 3 | 6 | - | 1 |
| Deposits held at bank | | | | |
| - savings and current accounts | 27,400 | 14,130 | 23,591 | 10,262 |
| - savings accounts (Private Funds) | - | 36 | - | 36 |
| - fixed deposit accounts less than 3 months | 47,451 | 19,569 | 47,451 | 19,569 |
| Total | 74,854 | 33,741 | 71,042 | 29,868 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

As at 31 December 2019, the interest rates on deposits in savings accounts are 0.01% – 2.00% per annum (2018: 0.01% – 3.09% per annum).

As at 31 December 2019, the interest rates on deposits in fixed accounts less than 3 months are 0.75% – 2.62% per annum (2018: 1.50% – 2.94% per annum) and these deposits have an average maturity of 89 days.

As at 31 December 2019, the Group's deposit at financial institutions of Baht 1,170 million were used to pledge as collateral for credit facilities (2018: Baht 1,472 million). However, the Group's deposit at financial institutions which pledged as collateral for credit facilities can be withdrawn if it meets the objectives and conditions of loan agreements to support the normal working capital and business operations of the Group (Note 23).

8 Deposit at a financial institution used as collateral

As at 31 December 2019, deposits at a financial institution used as short-term collateral represented deposits of a subsidiary amounting to Baht 325 million (2018: Baht 300 million), which was used as collateral for credit facilities with a financial institution as described in note 23. The amount is restricted for long-term loans and interest repayment that will be due in the next period.

9 Other investments

| | (Million Baht) | | | |
|--|--------------------------------------|--------|----------------------------------|--------|
| | Consolidated financial statements | | Separate financial statements | |
| As at 31 December | 2019 | 2018 | 2019 | 2018 |
| Short-term investments | | | | |
| Cash at bank - fixed deposits | 1,757 | 60,596 | 1,757 | 60,403 |
| Debt securities held to maturity | - | 721 | - | 721 |
| Debt securities - available-for-sale securities (Private funds) | - | 11,903 | - | 11,903 |
| | 1,757 | 73,220 | 1,757 | 73,027 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

| As at 31 December | Consolidated financial statements | | Separate financial statements | |
|---|--------------------------------------|---------------|----------------------------------|---------------|
| | 2019 | 2018 | 2019 | 2018 |
| (Million Baht) | | | | |
| Available-for-sale investments | | | | |
| Equity securities - available-for-sale securities | 383 | 361 | 383 | 361 |
| | 383 | 361 | 383 | 361 |
| Other long-term investments | | | | |
| Other non-marketable securities | 820 | 780 | 820 | 780 |
| | 820 | 780 | 820 | 780 |
| Total | 2,960 | 74,361 | 2,960 | 74,168 |

Cash at bank - fixed deposits

As at 31 December 2019, the Group's fixed deposits have not been pledged as collateral for credit facilities as described in note 23 (2018: Baht 540 million).

Equity securities - available-for-sale securities

During the year 2017, the Company entered into CIMB-Principal Energy and Petrochemical Index Fund (CIMB - PRINCIPAL EPIF), to invest in equities issued by the energy and petrochemical companies listed in The Stock Exchange of Thailand. The Company purchased 28.85 million units or amounting to Baht 300 million which its fair value as at 31 December 2019 is Baht 383 million. (2018: Baht 361 million).

Debt securities - available-for-sale securities

The Company established private funds and engaged independent assets management companies. As at 31 December 2019, the value of private funds outstanding totalling Baht 0.40 million (2018: Baht 11,939 million) (including cash at bank - savings account as disclosed in note 7). Those private funds have invested in debt securities which are considered at an investment grade.

Thai Oil Public Company Limited
As at 31 December 2019

Consolidated and Separate financial statements

During the year ended 31 December 2019, the Company invested in RVP II, L.P. amounting to Baht 39 million.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

10 Trade accounts receivable

(Million Baht)

| As at 31 December | Consolidated financial statements | | Separate financial statements | |
|---|--------------------------------------|--------|----------------------------------|--------|
| | 2019 | 2018 | 2019 | 2018 |
| Related parties (Note 39) | 9,484 | 11,812 | 14,241 | 17,390 |
| Other parties | 12,982 | 12,547 | 9,393 | 7,804 |
| Total | 22,466 | 24,359 | 23,634 | 25,194 |
| <u>Less</u> allowance for doubtful accounts | - | - | - | - |
| Trade accounts receivable, net | 22,466 | 24,359 | 23,634 | 25,194 |

Aging analyses for trade accounts receivable are as follows:

(Million Baht)

| As at 31 December | Consolidated financial statements | | Separate financial statements | |
|---|--------------------------------------|--------|----------------------------------|--------|
| | 2019 | 2018 | 2019 | 2018 |
| Related parties | | | | |
| Within credit terms | 9,484 | 11,812 | 14,241 | 17,390 |
| <u>Less</u> allowance for doubtful accounts | - | - | - | - |
| Net | 9,484 | 11,812 | 14,241 | 17,390 |
| Other parties | | | | |
| Within credit terms | 12,942 | 12,545 | 9,393 | 7,804 |
| Overdue: | | | | |
| - Less than 3 months | 40 | 2 | - | - |
| | 12,982 | 12,547 | 9,393 | 7,804 |
| <u>Less</u> allowance for doubtful accounts | - | - | - | - |
| Net | 12,982 | 12,547 | 9,393 | 7,804 |
| Total | 22,466 | 24,359 | 23,634 | 25,194 |

The normal credit term granted by the Group ranges from 7 days to 90 days.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

11 Other receivables

(Million Baht)

| As at 31 December | Consolidated financial statements | | Separate financial statements | |
|--|--------------------------------------|-------|----------------------------------|-------|
| | 2019 | 2018 | 2019 | 2018 |
| Prepaid expenses | 647 | 601 | 467 | 500 |
| Other accounts receivable | 219 | 256 | 417 | 502 |
| Current portion of long-term loans to savings co-operative of employees | 33 | 34 | 33 | 34 |
| Other | 389 | 491 | 256 | 408 |
| Total | 1,288 | 1,382 | 1,173 | 1,444 |

12 Inventories, net

(Million Baht)

| As at 31 December | Consolidated financial statements | | Separate financial statements | |
|--|--------------------------------------|--------|----------------------------------|--------|
| | 2019 | 2018 | 2019 | 2018 |
| Crude oil and feedstock | 11,678 | 9,874 | 10,656 | 8,835 |
| Materials, spare parts and supplies | 1,573 | 1,560 | 1,078 | 1,115 |
| Finished and semi-finished oil products | 8,300 | 6,995 | 6,189 | 4,245 |
| Goods in transit | | | | |
| Crude oil | 8,759 | 11,652 | 8,733 | 11,541 |
| Materials, spare parts and supplies | 85 | 16 | 2 | 2 |
| Less allowance for decline in value of inventories adjusted to net realisable value | | | | |
| - Crude oil and feedstock | (1) | (769) | (1) | (769) |
| - Finished and semi-finished oil products | (102) | (589) | - | (545) |
| Inventories, net | 30,292 | 28,739 | 26,657 | 24,424 |

As at 31 December 2019, the inventories as stated above included a legal reserve amounting to Baht 11,321 million (2018: Baht 10,413 million).

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Inventories recognised as expenses in cost of sale of goods for the year ended 31 December 2019 and 2018 are as follows:

| For the year ended 31 December | (Million Baht) | | | |
|---|--------------------------------------|---------|----------------------------------|---------|
| | Consolidated financial statements | | Separate financial statements | |
| | 2019 | 2018 | 2019 | 2018 |
| - Cost of sale of goods | 229,647 | 274,923 | 266,840 | 315,367 |
| - (Reversal of) write-down to net realisable value | (1,255) | 1,350 | (1,313) | 1,314 |
| Net | 228,392 | 276,273 | 265,527 | 316,681 |

13 Investments in subsidiaries

13.1 Movements of investments in subsidiaries are as follows:

| | (Million Baht) | |
|--|----------------------------------|--------|
| | Separate financial statements | |
| | 2019 | 2018 |
| At 1 January | 14,555 | 14,555 |
| Additional paid-up share capital in a subsidiary | 460 | - |
| At 31 December | 15,015 | 14,555 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Direct subsidiary

Thaioil Treasury Center Co., Ltd.

On 25 June 2019, the Extraordinary General Meeting of Shareholder No.1 of Thaioil Treasury Center Co., Ltd. (TTC) passed a resolution to issue additional share capital for 94.62 million shares with a par value of Baht 10 each, totaling of Baht 946.20 million. Total registered capital of TTC after issuing additional share capital will be Baht 956.20 million. The Company purchased all of its issued shares and initially paid up for these additional shares in July and October 2019 in an amount of Baht 460 million.

Indirect subsidiaries

TOP Ventures Co., Ltd.

In August 2019, TTC has directly invested in TOP Ventures Co., Ltd., which is a newly registered company in Thailand. TTC holds 99.99% of its total registered shares. TOP Ventures Co., Ltd. has 3.50 million ordinary shares with a par value of Baht 10 each, totalling Baht 35 million. TTC has initially paid up at 25% in an amount of Baht 8.75 million and TTC paid for its shares in August 2019.

TOP Ventures Hong Kong Limited

In August 2019, TTC has directly invested in TOP Ventures Hong Kong Limited (TVHK), which is a newly registered company in Hong Kong Special Administrative Region. TTC holds 100% of its total registered shares. TVHK has 1 ordinary share with a par value of Hong Kong Dollar 1. TTC has fully paid for its share proportion in August 2019.

TOP Ventures America LLC

In August 2019, TVHK, an indirect subsidiary of the Company, has directly invested in TOP Ventures America LLC which is a newly registered company in United States of America. TVHK holds 100% of its total registered shares. TOP Ventures America LLC has 1 ordinary share with a par value of US Dollar 1. TVHK has fully paid for its share in August 2019.

PT.Tirta Surya Raya

On 12 September 2019, TOP Solvent Company Limited (TS), an indirect subsidiary, purchased the shares in PT.Tirta Surya Raya (TSR) from the existing shareholders of TSR representing of 67% shareholding interests. TS purchased 15,410 shares, totalling US Dollar 1.28 million or equivalent to Baht 40.24 million as details shown in note 40.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

13.2 The details of subsidiaries are as follows:

| Separate financial statements | | | | | | | | | |
|---|--------------------------|---|-----------------------------------|--------|-------------------|-------------------|-------------------|-------------------|------------------------------|
| | Country of incorporation | Nature of the business | Percentage of direct shareholding | | Paid-up capital | | Cost method | | Dividend income for the year |
| | | | 2019 % | 2018 % | 2019 Million Baht | 2018 Million Baht | 2019 Million Baht | 2018 Million Baht | |
| Thai Paraxylene Co., Ltd. and its subsidiary | Thailand | Paraxylene manufacturing and distribution | 99.99 | 99.99 | 2,572 | 2,572 | 2,161 | 2,161 | 514 1,029 |
| - Subsidiary LABIX Co., Ltd. | Thailand | Linear Alkyl Benzene manufacturing and distribution | 75.00 | 75.00 | 4,655 | 4,655 | - | - | - |
| Thai Lube Base Public Company Limited | Thailand | Lube base oil refining and distribution | 99.99 | 99.99 | 1,758 | 1,758 | 1,979 | 1,979 | 88 1,318 |
| Thaioil Marine Co., Ltd. and its subsidiaries | Thailand | Providing marine transportation services for petroleum and liquid chemical products | 99.99 | 99.99 | 970 | 970 | 970 | 970 | - |
| - Subsidiaries TOP Maritime Service Co., Ltd. | Thailand | Providing marine transportation services for crew and utilities in the Gulf of Thailand | 99.99 | 99.99 | 520 | 520 | - | - | - |
| Thaioil Marine International Pte. Ltd. | Singapore | Investment in marine transportation for crude oil and petroleum product business | 100.00 | 100.00 | 274 | 274 | - | - | - |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited
As at 31 December 2019

| Separate financial statements | | | | | | | | | | |
|--|--------------------------|--|-----------------------------------|--------|-------------------|-------------------|-------------------|-------------------|------------------------------|-------------------|
| | Country of incorporation | Nature of the business | Percentage of direct shareholding | | Paid-up capital | | Cost method | | Dividend income for the year | |
| | | | 2019 % | 2018 % | 2019 Million Baht | 2018 Million Baht | 2019 Million Baht | 2018 Million Baht | 2019 Million Baht | 2018 Million Baht |
| Thaioil Energy Services Co., Ltd. | Thailand | Providing human resource management | 99.99 | 99.99 | 40 | 40 | 40 | 40 | - | - |
| Thaioil Solvent Co., Ltd. and its subsidiaries | Thailand | Investment in solvent and chemical business | 99.99 | 99.99 | 1,250 | 1,250 | 1,250 | 1,250 | - | - |
| - Subsidiaries | | | | | | | | | | |
| TOP Solvent Co., Ltd. and its subsidiaries | Thailand | Distribution of solvent and chemical products | 99.99 | 99.99 | 1,200 | 1,200 | - | - | - | - |
| Sak Chaisidhi Co., Ltd. | Thailand | Solvent and chemical products manufacturing | 80.52 | 80.52 | 190 | 190 | - | - | - | - |
| TOP Solvent (Vietnam) LLC. | Vietnam | Distribution of solvent and chemical products | 100.00 | 100.00 | 634 | 634 | - | - | - | - |
| PT.Tirta Surya Raya | Indonesia | Distribution of solvent and chemical products | 67.00 | - | 50 | - | - | - | - | - |
| Thaioil Ethanol Co., Ltd. and its subsidiaries | Thailand | Investment in ethanol businesses and alternative energy products | 99.99 | 99.99 | 1,450 | 1,450 | 1,450 | 1,450 | - | - |
| - Subsidiaries | | | | | | | | | | |
| Sapthip Co., Ltd. and its subsidiaries | Thailand | Ethanol products manufacturing and distribution | 50.00 | 50.00 | 800 | 800 | - | - | - | - |
| Sapthip Green Energy Co., Ltd. | Thailand | Biogas power generation and distribution | 99.99 | 99.99 | 25 | 20 | - | - | - | - |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

| Separate financial statements | | | | | | | | | | |
|---|--------------------------|--|-----------------------------------|--------|-------------------|-------------------|-------------------|-------------------|------------------------------|-------------------|
| | Country of incorporation | Nature of the business | Percentage of direct shareholding | | Paid-up capital | | Cost method | | Dividend income for the year | |
| | | | 2019 % | 2018 % | 2019 Million Baht | 2018 Million Baht | 2019 Million Baht | 2018 Million Baht | 2019 Million Baht | 2018 Million Baht |
| Thaioil Power Co., Ltd. | Thailand | Power and stream generation and distribution | 73.99 | 73.99 | 2,810 | 2,810 | 3,195 | 3,195 | 676 | 520 |
| TOP SPP Co., Ltd. | Thailand | Power and stream generation and distribution | 99.99 | 99.99 | 3,500 | 3,500 | 3,500 | 3,500 | 858 | 1,050 |
| Thaioil Treasury Center Co., Ltd. and its subsidiaries - Subsidiaries | Thailand | Treasury center for the Group's business | 99.99 | 99.99 | 470 | 10 | 470 | 10 | - | - |
| TOP Ventures Company Limited | Thailand | Investment in venture capital and/or start-up business | 99.99 | - | 9 | - | - | - | - | - |
| TOP Ventures Hong Kong Limited and its subsidiaries | Hong Kong | Investment in venture capital and/or start-up business | 100.00 | - | - | - | - | - | - | - |
| TOP Ventures America LLC. | United States of America | Investment in venture capital and/or start-up business | 100.00 | - | - | - | - | - | - | - |
| Total investment in subsidiaries | | | | | 15,015 | 14,555 | 2,136 | 3,917 | | |

None of the Company's investment in subsidiaries are publicly listed and consequently they do not have published price quotations.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Impairment assessment for loan to and investment in a subsidiary

The Company has assessed the recoverable amount of loan to and investment in Thail Marine Co., Ltd. by determining discounted future cash flows. The key assumptions used to determine recoverable amount included freight rate and utilisation rate, expected changes to working capital, operating expenditures, long-term growth rate derived from expectations of future outcomes taking into account of the past experience, adjusted for anticipated revenue growth and discount rate referred to weighted average cost of capital (WACC) at 7.61%. The recoverable amount was estimated to be higher than its carrying amount and no impairment was required to separate financial statements. The following table shows the amount by which this key assumption would need to be changed individually for the estimated recoverable amount to be equal the carrying amount.

| | % |
|-----------------------------|------|
| Forecasted revenue decrease | 3.82 |
| Discount rate increase | 3.61 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

13.3 Summarised financial information on subsidiaries with material non-controlling interests

Set out below are the summarised financial information for each subsidiary that has non-controlling interests and are material to the Group. The amounts disclosed for each subsidiary are before inter-company eliminations.

See note 28 for transactions with non-controlling interests.

Summarised statement of financial position

| As at 31 December | Thaioil Power Co., Ltd. | | LABIX Co., Ltd. | | Other individually immaterial subsidiaries | | | Total |
|--|-------------------------|---------------|-----------------|--------------|--|------|-------|-------|
| | 2019 | 2018 | 2019 | 2018 | 2019 | 2018 | 2018 | |
| Non-controlling interest percentage | 26.01 | 26.01 | 25.00 | 25.00 | | | | |
| Current assets | 977 | 1,196 | 1,600 | 2,615 | | | | |
| Non-current assets | 22,824 | 10,381 | 10,962 | 11,371 | | | | |
| Current liabilities | (446) | (630) | (2,774) | (3,573) | | | | |
| Non-current liabilities | (15,458) | - | (5,500) | (5,994) | | | | |
| Net assets | 7,897 | 10,947 | 4,288 | 4,419 | | | | |
| Carrying amount of non-controlling interests | 2,054 | 2,847 | 1,072 | 1,105 | 825 | 808 | 3,951 | 4,760 |

(Million Baht)

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

(Million Baht)

| For the year ended 31 December | Thaioil Power Co., Ltd. | | LABIX Co., Ltd. | | Other individually immaterial subsidiaries | | | Total | |
|---|-------------------------|--------------|-----------------|--------------|--|------|------|-------|------|
| | 2019 | 2018 | 2019 | 2018 | 2019 | 2018 | 2019 | 2018 | 2018 |
| Summarised statement of comprehensive income | | | | | | | | | |
| Revenue from sales and services | 4,391 | 4,409 | 17,473 | 19,117 | | | | | |
| Profit (loss) | 1,026 | 1,101 | (131) | (178) | | | | | |
| Other comprehensive income (expense) | (26) | 1 | - | - | | | | | |
| Total comprehensive income (expense) | 1,000 | 1,102 | (131) | (178) | | | | | |
| Profit (loss) allocated to non-controlling interests | 267 | 286 | (33) | (45) | 6 | (6) | 240 | 235 | |
| Other comprehensive income (expense) allocated to non-controlling interests | 260 | 284 | (33) | (45) | 6 | (6) | 233 | 233 | |
| Summarised statement of cash flows | | | | | | | | | |
| Cash flows from operating activities | 313 | 671 | 364 | 1,345 | | | | | |
| Cash flows from investing activities | (14,973) | 390 | 190 | 157 | | | | | |
| Cash flows from financing activities | 14,467 | (871) | (795) | (1,163) | | | | | |
| Net increase (decrease) in cash and cash equivalents | (193) | 190 | (241) | 339 | | | | | |
| Cash and cash equivalents at the beginning of the year | 617 | 427 | 392 | 54 | | | | | |
| Exchange losses on cash and cash equivalents | - | - | - | (1) | | | | | |
| Cash and cash equivalents at the end of the year | 424 | 617 | 151 | 392 | | | | | |
| Dividends paid to non-controlling interests | 237 | 183 | - | - | | | | | |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

14 Investments in joint ventures and associates

14.1 Movements of investments in joint ventures and associates are as follows:

| For the year ended 31 December | Consolidated financial statements | | Separate financial statements | |
|--|--------------------------------------|--------|----------------------------------|-------|
| | 2019 | 2018 | 2019 | 2018 |
| At 1 January | 14,941 | 14,368 | 1,261 | 1,261 |
| Addition of investment in an associate | 21,971 | - | 6,591 | - |
| Share of profit of joint ventures and associates, net | 1,299 | 1,193 | - | - |
| Dividend income | (596) | (605) | - | - |
| Exchange differences on translation | (69) | (3) | - | - |
| Share of other comprehensive expense of associates, net of tax | (3) | (12) | - | - |
| Loss from the change in the ownership interests in an associate | (3) | - | - | - |
| Deficit from the change in the net assets in an associate | (4,481) | - | - | - |
| At 31 December | 33,059 | 14,941 | 7,852 | 1,261 |

(Million Baht)

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Direct associate

Global Power Synergy Public Company Limited

On 20 June 2018, Global Power Synergy Public Company Limited (GPSC), an associate of the Group entered into Share Purchase Agreement with a company which is a shareholder of Glow Energy Public Company Limited (GLOW) to purchase shares of GLOW. The shares purchase transaction has already been completed on 14 March 2019. The associate has purchased both direct and indirect shares of GLOW for 69.11% of total registered and paid-up capital.

Subsequently, during the year, the associate submitted the tender offer to purchase remaining shares from GLOW's minority shareholders. The associate has acquired additional 30.72% of total registered and paid-up capital from the tender offer, resulting in the associate to be the major shareholders of GLOW with a 99.83% of total registered and paid-up capital in total. Therefore, the investment has been reclassified to be an investment in a subsidiary. Consequently, the Group recognised deficit from the change in the net assets in an associate resulting from the change in ownership interest in GLOW, totalling Baht 4,452 million in the shareholder's equity.

The Committee of Stock Exchange of Thailand had an order to delist the securities of GLOW from being the listed securities on the Stock Exchange of Thailand since 13 December 2019 onwards.

On 4 October 2019, the Company and a subsidiary paid for additional shares capital to GPSC which issued and offered the newly-issued ordinary shares to the existing shareholders proportionate to their respective shareholdings whereby the existing shareholders are able to oversubscribe for the newly-issued ordinary shares. Consequently, the Group's ownership interest diluted from 29.70% to 29.69%. The Group recognised loss from the change in ownership interest in an associate amounting to Baht 3 million in administrative expenses in the statement of income. In addition, the newly-issued ordinary shares of GPSC has a share issuance cost amounting to Baht 95 million which the Group has recognised a deficit from the change in the net assets in an associate amounting to Baht 29 million in the shareholder's equity.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

14.2 Investments in joint ventures

The details of joint ventures are as follows:

| Consolidated financial statements | | | | | | | | | | |
|-------------------------------------|--------------------------|---|--------------------------------------|-------|--------------|--------------|---------------|--------------|-----------------|--------------|
| | Country of incorporation | Nature of business | Ownership interest held by the Group | | Cost method | | Equity method | | Dividend income | |
| | | | 2019 | 2018 | 2019 | 2018 | 2019 | 2018 | 2019 | 2018 |
| | | | % | % | Million Baht | Million Baht | Million Baht | Million Baht | Million Baht | Million Baht |
| TOP-NTL Pte. Ltd. | Singapore | Providing service as a trustee manager | 50.00 | 50.00 | - | - | 18 | 16 | - | - |
| TOP-NTL Shipping Trust | Singapore | Investment in marine transportation for crude oil and petroleum product business | 50.00 | 50.00 | 24 | 24 | 73 | 67 | - | - |
| TOP Nautical Star Co., Ltd. | Thailand | Providing marine transportation services for crude oil, feedstock and petroleum product and storage | 35.00 | 35.00 | 53 | 53 | 120 | 110 | - | - |
| TOP-NYK MarineOne Pte. Ltd. | Singapore | Providing marine transportation for crude oil and petroleum product business | 50.00 | 50.00 | 274 | 274 | 406 | 432 | - | 33 |
| Total investments in joint ventures | | | | | 351 | 351 | 617 | 625 | - | 33 |

All joint ventures above are private companies and do not have a quoted market price available for their shares. There are no contingent liabilities relating to the Group's interest in these joint ventures.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

14.3 Investments in associates

The details of associates are as follows:

| Consolidated financial statements | | | | | | | | | | |
|--|-----------------------------|---|---|-------|--------------|--------------|---------------|--------------|-----------------|--------------|
| | Country of incorporation | Nature of business | Ownership interest held by the Group | | Cost method | | Equity method | | Dividend income | |
| | | | 2019 | 2018 | 2019 | 2018 | 2019 | 2018 | 2019 | 2018 |
| | | | % | % | Million Baht | Million Baht | Million Baht | Million Baht | Million Baht | Million Baht |
| PTT Digital Solutions Co., Ltd. | Thailand | Provide information technology and computer service activities | 20.00 | 20.00 | 30 | 30 | 428 | 368 | 18 | 16 |
| PTT Energy Solutions Co., Ltd. | Thailand | Provide technical and operational services | 20.00 | 20.00 | 30 | 30 | 42 | 48 | - | - |
| Global Power Synergy Public Company Limited | Thailand | Power, steam and water generation and distribution for industries | 29.69 | 29.70 | 19,235 | 3,855 | 31,159 | 13,081 | 578 | 556 |
| Ubon Bio Ethanol Public Company Limited | Thailand | Ethanol products manufacturing and distribution | 21.28 | 21.28 | 769 | 769 | 810 | 819 | - | - |
| T. I. M. Ship Management Co., Ltd. | Thailand | Provide ship management services | 33.33 | 33.33 | 1 | 1 | 3 | - | - | - |
| Total investments in associates | | | | | 20,065 | 4,685 | 32,442 | 14,316 | 596 | 572 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

| Country of incorporation | Nature of business | Separate financial statements | | | | | |
|--|--------------------|---|-------|--------------|--------------|-----------------|--------------|
| | | Ownership interest held by the Company | | Cost method | | Dividend income | |
| | | 2019 | 2018 | 2019 | 2018 | 2019 | 2018 |
| | | % | % | Million Baht | Million Baht | Million Baht | Million Baht |
| PTT Digital Solutions Co., Ltd. | Thailand | 20.00 | 20.00 | 30 | 30 | 18 | 16 |
| | | | | | | | |
| PTT Energy Solutions Co., Ltd. | Thailand | 20.00 | 20.00 | 30 | 30 | - | - |
| | | | | | | | |
| Global Power Synergy Public Company Limited | Thailand | 8.91 | 8.91 | 7,792 | 1,201 | 174 | 167 |
| | | | | | | | |
| Total investments in associates | | | | 7,852 | 1,261 | 192 | 183 |

As at 31 December 2019, the fair value of the Group and the Company's interests in Global Power Synergy Public Company Limited, which is listed in the Stock Exchange of Thailand, were Baht 71,794 million and 21,538 million (2018: Baht 23,188 million and 6,956 million).

Other associates are private companies and do not have a quoted market price available for their shares. There are no contingent liabilities relating to the Group's interest in these associates.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Summarised financial information for associates

Set out below are the summarised financial information for the associates that are material to the Group. The information disclosed reflects the amounting presented in the financial statements of the relevant associates (not the Group's shares of those amounts). They have been amended to reflect adjustments made using the equity method, including fair value adjustments and modifications for differences in accounting policy.

Summarised statement of financial position

| | (Million Baht) | |
|---|--|---------------|
| | Global Power Synergy Public Company Limited | |
| As at 31 December | 2019 | 2018 |
| Current assets | 38,919 | 12,164 |
| Non-current assets | 213,097 | 52,275 |
| Current liabilities | (36,748) | (4,727) |
| Non-current liabilities | (105,092) | (17,363) |
| Net assets | 110,176 | 42,349 |
| Attributable to non-controlling interests | 9,283 | 2,357 |
| Attributable to investee's shareholders | 100,893 | 39,992 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Summarised statement of comprehensive income

| | (Million Baht) | |
|---|--|--------------|
| | Global Power Synergy Public Company Limited | |
| For the year ended 31 December | 2019 | 2018 |
| Revenue | 66,562 | 24,880 |
| Net profit | 6,001 | 3,889 |
| Other comprehensive expense | (151) | (41) |
| Total comprehensive income | 5,850 | 3,848 |
| Attributable to non-controlling interests | 1,914 | 530 |
| Attributable to investee's shareholders | 3,936 | 3,318 |

Reconciliation of summarised financial information

Reconciliation of the summarised financial information presented to the carrying amount of its interest in associate.

| | (Million Baht) | |
|---|--|---------------|
| | Global Power Synergy Public Company Limited | |
| | 2019 | 2018 |
| Summarised financial information | | |
| Group's interest in net assets of investee at 1 January | 13,081 | 12,652 |
| Addition of investment in an associate | 21,971 | - |
| Total comprehensive income attributable to the associate | 1,169 | 985 |
| Dividends received during the year | (578) | (556) |
| Loss from the change in the ownership interests in an associate | (3) | - |
| Deficit from the change in the net assets in an associate | (4,481) | - |
| Group's interest in net assets of investee at 31 December | 31,159 | 13,081 |
| Carrying amount of interest in associates At 31 December | 31,159 | 13,081 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Individually immaterial joint ventures and associates

In addition to the interests in associates disclosed above, the Group also has interests in a number of individually immaterial joint ventures and associates that are accounted for using the equity method.

| (Million Baht) | | |
|--|---|------|
| | Individually immaterial joint ventures | |
| | 2019 | 2018 |
| Aggregate carrying amount of individually immaterial joint ventures | 617 | 625 |
| Aggregate amounts of the Group's share of | | |
| Profit from continuing activities | 26 | 118 |
| Other comprehensive expense | (34) | (35) |
| Total comprehensive income (expense) | (8) | 83 |

| (Million Baht) | | |
|--|---------------------------------------|-------|
| | Individually immaterial associates | |
| | 2019 | 2018 |
| Aggregate carrying amount of individually immaterial associates | 1,283 | 1,235 |
| Aggregate amounts of the Group's share of | | |
| Profit from continuing activities | 67 | 77 |
| Other comprehensive expense | (2) | - |
| Total comprehensive income | 65 | 77 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

15 Investment property, net

| (Million Baht) | | | | |
|---|--------------------------------------|---------|----------------------------------|-----------|
| | Consolidated financial statements | | Separate financial statements | |
| | 2019 | 2018 | 2019 | 2018 |
| As at 1 January | | | | |
| Cost | 103 | 103 | 1,111 | 1,111 |
| <u>Less</u> Provision for impairment | - | - | (11) | (11) |
| Net book amount | 103 | 103 | 1,100 | 1,100 |
| For the year ended 31 December | | | | |
| Opening net book amount | 103 | 103 | 1,100 | 1,100 |
| Transfer from property, plant and equipment, net (Note 16) | - | - | 30 | - |
| Reversal of provision for impairment | - | - | 11 | - |
| Closing net book amount | 103 | 103 | 1,141 | 1,100 |
| As at 31 December | | | | |
| Cost | 103 | 103 | 1,141 | 1,111 |
| <u>Less</u> Provision for impairment | - | - | - | (11) |
| Net book amount | 103 | 103 | 1,141 | 1,100 |
| Fair value | 458 | 273 | 2,682 | 1,764 |

The fair value of investment property of the Group and the Company's are Baht 458 million and 2,682 million, respectively (2018: Baht 273 million and 1,764 million, respectively) which are valued by an independent appraiser certified by Professional Standard under the open market values on an existing use basis and income approach.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Fair value Measurement

Fair value hierarchy

The fair value of investment property was determined by external, independent property valuers, having appropriate recognised professional qualifications and experiences in valuing the property. The independent valuers provide the fair value of the Group's investment property portfolio on a regular basis.

The fair value measurement for all investment property has been categorised as a level 3 fair value based on the inputs to the valuation technique used.

The following table shows the valuation technique used in measuring the fair value of investment property, as well as the significant unobservable inputs used.

| Valuation technique | Significant unobservable inputs | Inter-relationship between key unobservable inputs and fair value measurement |
|--|--|--|
| <p>- <u>Discounted cash flows:</u> The valuation model considers the present value of net cash flows to be generated from the property, taking into account expected rental growth rate. The expected net cash flows are discounted using risk-adjusted discount rates. Among other factors, the discount rate estimation considers the quality of its location (prime vs secondary), tenant credit quality and lease terms.</p> | <ul style="list-style-type: none"> Contractually agreed lease income over the remaining period. The risk-adjusted discount rates (6%-7%) | <p>The estimated fair value increase (decrease) if:</p> <ul style="list-style-type: none"> Expected market rental growth were higher (lower); The risk-adjusted discount rate were lower (higher). |
| <p>- <u>Market approach</u></p> | <p>The adjusted quoted price and the actual selling price of comparable investment properties</p> | <p>The estimated fair value increase (decrease) if land price were higher (lower).</p> |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Amounts recognised in profit and loss that are related to investment property are as follows:

| | (Million Baht) | | | |
|---------------|--------------------------------------|------|----------------------------------|------|
| | Consolidated financial statements | | Separate financial statements | |
| | 2019 | 2018 | 2019 | 2018 |
| Rental income | 8 | 8 | 44 | 44 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

16 Property, plant and equipment, net

| Consolidated financial statements | | | | | | | | | | | | | (Million Baht) |
|---|-------|-----------|--------------------------------|------------------------------------|------------------------------|-----------------|---------------------------------|--------------------------------------|---|--|-----------------------------|----------------|----------------|
| | Land | Buildings | Leasehold improve- ments | Refinery plant and equipment | Petro- chemical plants | Power plants | Trans- mission facilities | Machinery, equipment and plant | Oil and liquid chemical tankers and crew boats and others | Furniture, fixtures, office equipment | Construction in progress | Total | |
| At 1 January 2018 | | | | | | | | | | | | | |
| Cost | 6,237 | 2,011 | 211 | 104,671 | 34,862 | 17,388 | 193 | 6,222 | 4,566 | 911 | 18 | 4,985 182,275 | |
| Less Accumulated depreciation | - | (1,339) | (16) | (76,336) | (14,873) | (5,102) | (156) | (3,372) | (1,233) | (664) | (14) | - (103,105) | |
| Less Provision for impairment | (11) | - | - | - | - | - | - | - | (547) | - | - | - (558) | |
| Net book amount | 6,226 | 672 | 195 | 28,335 | 19,989 | 12,286 | 37 | 2,850 | 2,786 | 247 | 4 | 4,985 78,612 | |
| For the year ended 31 December 2018 | | | | | | | | | | | | | |
| Opening net book amount | 6,226 | 672 | 195 | 28,335 | 19,989 | 12,286 | 37 | 2,850 | 2,786 | 247 | 4 | 4,985 78,612 | |
| Exchange differences | - | (1) | - | - | - | - | - | (1) | - | - | - | - (2) | |
| Additions during the year | 302 | 1 | - | 200 | 6 | - | - | 54 | 35 | 16 | 1 | 7,412 8,027 | |
| Transfer in (out) | - | 726 | - | 14 | 62 | 32 | - | 353 | - | 15 | - | - (1,202) | |
| Disposals, net | - | (1) | - | (2) | - | - | - | (1) | (646) | (1) | - | - (651) | |
| Depreciation charged during the year | - | (83) | (8) | (3,178) | (2,018) | (722) | (6) | (349) | (149) | (72) | (1) | - (6,586) | |
| Reversal of provision for impairment, net | - | - | - | - | - | - | - | - | 529 | - | - | - 529 | |
| Closing net book amount | 6,528 | 1,314 | 187 | 25,369 | 18,039 | 11,596 | 31 | 2,906 | 2,555 | 205 | 4 | 11,195 79,929 | |
| At 31 December 2018 | | | | | | | | | | | | | |
| Cost | 6,539 | 2,690 | 211 | 104,752 | 34,930 | 17,420 | 193 | 6,621 | 3,355 | 938 | 18 | 11,195 188,862 | |
| Less Accumulated depreciation | - | (1,376) | (24) | (79,383) | (16,891) | (5,824) | (162) | (3,715) | (782) | (733) | (14) | - (108,904) | |
| Less Provision for impairment | (11) | - | - | - | - | - | - | - | (18) | - | - | - (29) | |
| Net book amount | 6,528 | 1,314 | 187 | 25,369 | 18,039 | 11,596 | 31 | 2,906 | 2,555 | 205 | 4 | 11,195 79,929 | |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

(Million Baht)

Consolidated financial statements

| | Land | Buildings | Leasehold improve- ments | Refinery plant and equipment | Petro- chemical plants | Power plants | Trans- mission facilities | Machinery, equipment and plant equipment | Oil and liquid chemical tankers and crew boats and others | Furniture, fixtures, office equipment | Construction in progress | Total |
|---|-------|-----------|--------------------------------|------------------------------------|------------------------------|-----------------|---------------------------------|---|---|--|-----------------------------|----------------|
| For the year ended | | | | | | | | | | | | |
| 31 December 2019 | | | | | | | | | | | | |
| Opening net book amount | 6,528 | 1,314 | 187 | 25,369 | 18,039 | 11,596 | 31 | 2,906 | 2,555 | 205 | 4 | 11,195 79,929 |
| Exchange differences | - | (6) | - | - | - | - | - | (19) | - | - | - | (4) (29) |
| Additions during the year | 505 | 26 | - | 916 | 1,060 | - | - | 76 | 19 | 19 | - | 30,574 33,195 |
| Addition from business combination (Note 40) | - | - | 1 | - | - | - | - | - | - | 2 | - | 3 |
| Transfer in (out) | - | 915 | - | 2,229 | 299 | 40 | - | 338 | 173 | 72 | - | (4,066) - |
| Transfer to intangible assets (Note 18) | - | - | - | - | - | - | - | - | - | - | - | (1) (1) |
| Disposals, net | - | (6) | - | (6) | (51) | - | - | - | (101) | - | - | - (164) |
| Depreciation charged during the year | - | (160) | (8) | (3,068) | (1,841) | (716) | (8) | (347) | (159) | (77) | (1) | - (6,385) |
| Reversal of provision for impairment, net | 11 | - | - | - | - | - | - | - | - | - | - | 11 |
| Closing net book amount | 7,044 | 2,083 | 180 | 25,440 | 17,506 | 10,920 | 23 | 2,954 | 2,487 | 221 | 3 | 37,698 106,559 |
| At 31 December 2019 | | | | | | | | | | | | |
| Cost | 7,044 | 3,523 | 212 | 104,280 | 35,958 | 17,460 | 193 | 6,972 | 3,416 | 1,012 | 14 | 37,698 217,782 |
| Less Accumulated depreciation | - | (1,440) | (32) | (78,840) | (18,452) | (6,540) | (170) | (4,018) | (911) | (791) | (11) | - (111,205) |
| Less Provision for impairment | - | - | - | - | - | - | - | - | (18) | - | - | - (18) |
| Net book amount | 7,044 | 2,083 | 180 | 25,440 | 17,506 | 10,920 | 23 | 2,954 | 2,487 | 221 | 3 | 37,698 106,559 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

(Million Baht)

| | Separate financial statements | | | | | | |
|--|-------------------------------|-----------|------------------------------------|---|---|-----------------------------|----------|
| | Land | Buildings | Refinery plant and equipment | Machinery, equipment and plant equipment | Furniture, fixtures, office equipment and others | Construction in progress | Total |
| At 1 January 2018 | | | | | | | |
| Cost | 3,856 | 844 | 96,453 | 1,257 | 557 | 4,691 | 107,662 |
| <u>Less</u> Accumulated depreciation | - | (726) | (69,434) | (1,034) | (382) | - | (71,580) |
| Net book amount | 3,856 | 118 | 27,019 | 223 | 175 | 4,691 | 36,082 |
| For the year ended 31 December 2018 | | | | | | | |
| Opening net book amount | 3,856 | 118 | 27,019 | 223 | 175 | 4,691 | 36,082 |
| Additions during the year | 298 | - | 200 | 27 | 13 | 6,584 | 7,122 |
| Transfer in (out) | - | 642 | 14 | 2 | 2 | (660) | - |
| Disposals, net | - | (1) | (1) | - | - | - | (2) |
| Depreciation charged during the year | - | (28) | (3,078) | (61) | (45) | - | (3,212) |
| Closing net book amount | 4,154 | 731 | 24,154 | 191 | 145 | 10,615 | 39,990 |
| At 31 December 2018 | | | | | | | |
| Cost | 4,154 | 1,439 | 96,535 | 1,284 | 572 | 10,615 | 114,603 |
| <u>Less</u> Accumulated depreciation | - | (708) | (72,381) | (1,093) | (427) | - | (74,613) |
| Net book amount | 4,154 | 731 | 24,154 | 191 | 145 | 10,615 | 39,990 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

| | Separate financial statements | | | | | | (Million Baht) |
|--------------------------------------|-------------------------------|-----------|------------------------------------|---|---|-----------------------------|----------------|
| | Land | Buildings | Refinery plant and equipment | Machinery, equipment and plant equipment | Furniture, fixtures, office equipment and others | Construction in progress | Total |
| For the year ended | | | | | | | |
| 31 December 2019 | | | | | | | |
| Opening net book amount | 4,154 | 731 | 24,154 | 191 | 145 | - | 39,990 |
| Additions during the year | 505 | 21 | 916 | 33 | 13 | - | 31,559 |
| Transfer in (out) | - | 834 | 2,228 | 76 | 32 | - | - |
| Transfer to investment property | | | | | | | |
| (Note 15) | (30) | - | - | - | - | - | (30) |
| Disposals, net | - | (5) | (6) | - | - | - | (11) |
| Depreciation charged during the year | - | (103) | (2,967) | (67) | (50) | - | (3,187) |
| Closing net book amount | 4,629 | 1,478 | 24,325 | 233 | 140 | - | 68,321 |
| At 31 December 2019 | | | | | | | |
| Cost | 4,629 | 2,197 | 96,063 | 1,357 | 604 | - | 142,366 |
| Less Accumulated depreciation | - | (719) | (71,738) | (1,124) | (464) | - | (74,045) |
| Net book amount | 4,629 | 1,478 | 24,325 | 233 | 140 | - | 68,321 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

The gross amounts of the Group's and the Company's fully depreciated property, plant and equipment that were still in use as at 31 December 2019, were Baht 53,767 million (2018: Baht 56,387 million) and Baht 44,191 million (2018: Baht 47,894 million), respectively.

As at 31 December 2019, certain subsidiaries mortgaged their land, building, petrochemical plant, machines and crew boats as collateral for credit facilities as described in note 23. The net book value of land, building, petrochemical plant, machines and crew boats amounted to Baht 20,304 million (2018: Baht 21,373 million).

For the year ended 31 December 2019, borrowing costs of Baht 1,592 million for the Group and Baht 1,722 million for the Company represented the specific borrowing to finance the Clean Fuel Project. The Group and the Company applied capitalisation rate at 4.625% to 5.375% and 5.22% to 5.96% per annum, respectively for borrowing cost calculation. The borrowing costs were included in 'Additions during the year'.

An indirect subsidiary's crew boat which is the asset under marine transportation services segment was classified as non-current assets held-for-sale during the second quarter of the year 2019 at the lower of its carrying amount and fair value less cost to sell from the time the Group considered that this asset is held-for-sale. Therefore, the Group recognised its loss of Baht 43.81 million as the administrative expenses in the statement of income. Also, the Group measured the non-recurring fair value using the market approach, and this fair value falls within a level 2 of the fair value hierarchy.

The classification of the non-current assets held-for-sale was in line with the operating business strategy and sales obligations of the indirect subsidiary's management. The sales completed in July 2019.

Impairment assessment for vessels and crew boats

During 2019, certain subsidiaries have vessels and crew boats which are not fully utilised in operation due to the fact that the exploration business is in the downturn and resulted in low freight charge and demand in marine transportation business. This situation indicated that vessels and crew boats may be impaired. Management calculated the recoverable amount by comparing between the higher of the fair value less costs to sell and value-in-use. Management of subsidiaries engaged an independent appraiser to determine the fair value of underlying assets using market approach. As a result, value in use is higher and will be used as recoverable amount.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Value-in-use is calculated by determining discounted future cash flows. The Key assumption used to determine value-in-use included freight rate, utilisation rate, expected changes to working capital, operating expenditures, long-term growth rate derived from expectation of future outcomes taking into account of the past experience, adjusted for anticipated revenue growth and discount rate referred to weighted average cost of capital (WACC) at 8.20%.

Subsidiaries did not recognise impairment loss because the value-in-use of assets was higher than its carrying amount. Management has considered a reasonably possible change in a key assumption could cause the carrying amount to exceed the recoverable amount. The following table shows the amount by which this key assumption would need to be changed individually for the estimated recoverable amount to be equal the carrying amount.

| | % |
|-----------------------------|------|
| Forecasted revenue decrease | 7.67 |
| Discount rate increase | 4.10 |

Measurement of fair value

Fair value hierarchy

The fair value of assets of subsidiaries which are not fully utilised in operation was determined by management of subsidiaries and external independent appraiser who has an appropriate recognised professional qualifications and recent experience in the category of the asset being valued. The fair value measurement for assets which are not fully used in operation has been categorised as a level 2 fair value based on the input to the valuation technique used by using market approach.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

17 Goodwill

| (Million Baht) | | |
|---|--------------------------------------|------|
| | Consolidated financial statements | |
| | 2019 | 2018 |
| At 1 January 2018 | | |
| Cost | 790 | 806 |
| Net book amount | 790 | 806 |
| For the year ended 31 December | | |
| Opening net book amount | 790 | 806 |
| Additions from business combination (Note 40) | 13 | - |
| Exchange differences | (38) | (16) |
| Closing net book amount | 765 | 790 |
| At 31 December 2018 | | |
| Cost | 765 | 790 |
| Net book amount | 765 | 790 |

Goodwill is allocated to the Group's cash-generating units (CGUs) identified according to business segment which is solvent segment.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Impairment testing for goodwill

The recoverable amount was based on its value-in-use, determined by discounting future cash flows to be generated in the future from the continuing use of CGU which based on the management approved financial five-year budget. Those cash flows are determined by annual earnings before interest, taxes, depreciation, and amortisation (EBITDA) estimated by management, adjusted by corporate income tax, change in working capital and relevant capital expenditures. The estimate also included a long-term growth rate with reference to gross domestic product (GDP) growth rates for the countries in which the CGUs operates and experiences by management.

Based on the goodwill impairment testing by the discounted cash flow method using the estimated rates referred to weighted average cost of capital (WACC) of Thailand and Vietnam at the rates 8.75% and 11.16% and long-term growth rate at the rates 3.00% and 6.80%, respectively. The recoverable amount was estimated to be higher than its carrying amount and no impairment was required to be recognised in the Group's financial statements. Management has considered a reasonably possible change in a key assumption could cause the carrying amount to exceed the recoverable amount. The following table shows the amount by which this key assumption would need to be changed individually for the estimated recoverable amount to be equal the carrying amount.

| | (%) | |
|--------------------------------|-------------------------|------------------------|
| | Goodwill in Thailand | Goodwill in Vietnam |
| Discount rate increase | 4.80 | 0.20 |
| Long-term growth rate decrease | 7.43 | 0.24 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

18 Intangible assets, net

(Million Baht)

| | Consolidated financial statements | | | |
|--|-----------------------------------|-------------------|--------|---------|
| | License fee | Computer software | Patent | Total |
| At 1 January 2018 | | | | |
| Cost | 3,274 | 855 | 1 | 4,130 |
| <u>Less</u> Accumulated amortisation | (1,364) | (381) | - | (1,745) |
| Net book amount | 1,910 | 474 | 1 | 2,385 |
| For the year ended 31 December 2018 | | | | |
| Opening net book amount | 1,910 | 474 | 1 | 2,385 |
| Additions during the year | 58 | 73 | - | 131 |
| Adjustment | (72) | - | - | (72) |
| Amortisation charged during the year | (122) | (67) | - | (189) |
| Closing net book amount | 1,774 | 480 | 1 | 2,255 |
| At 31 December 2018 | | | | |
| Cost | 3,253 | 928 | 1 | 4,182 |
| <u>Less</u> Accumulated amortisation | (1,479) | (448) | - | (1,927) |
| Net book amount | 1,774 | 480 | 1 | 2,255 |
| For the year ended 31 December 2019 | | | | |
| Opening net book amount | 1,774 | 480 | 1 | 2,255 |
| Additions during the year | 215 | 103 | - | 318 |
| Transfer from property, plant and equipment, net (Note 16) | - | 1 | - | 1 |
| Amortisation charged during the year | (96) | (91) | - | (187) |
| Closing net book amount | 1,893 | 493 | 1 | 2,387 |
| At 31 December 2019 | | | | |
| Cost | 3,468 | 1,032 | 1 | 4,501 |
| <u>Less</u> Accumulated amortisation | (1,575) | (539) | - | (2,114) |
| Net book amount | 1,893 | 493 | 1 | 2,387 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

(Million Baht)

| | Separate financial statements | | | |
|--|-------------------------------|-------------------|--------|---------|
| | License fee | Computer software | Patent | Total |
| At 1 January 2018 | | | | |
| Cost | 838 | 708 | 1 | 1,547 |
| <u>Less</u> Accumulated amortisation | (775) | (242) | - | (1,017) |
| Net book amount | 63 | 466 | 1 | 530 |
| For the year ended 31 December 2018 | | | | |
| Opening net book amount | 63 | 466 | 1 | 530 |
| Additions during the year | 17 | 66 | - | 83 |
| Amortisation charged during the year | (25) | (59) | - | (84) |
| Closing net book amount | 55 | 473 | 1 | 529 |
| At 31 December 2018 | | | | |
| Cost | 855 | 774 | 1 | 1,630 |
| <u>Less</u> Accumulated amortisation | (800) | (301) | - | (1,101) |
| Net book amount | 55 | 473 | 1 | 529 |
| For the year ended 31 December 2019 | | | | |
| Opening net book amount | 55 | 473 | 1 | 529 |
| Additions during the year | 112 | 101 | - | 213 |
| Amortisation charged during the year | (10) | (83) | - | (93) |
| Closing net book amount | 157 | 491 | 1 | 649 |
| At 31 December 2019 | | | | |
| Cost | 967 | 875 | 1 | 1,843 |
| <u>Less</u> Accumulated amortisation | (810) | (384) | - | (1,194) |
| Net book amount | 157 | 491 | 1 | 649 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

19 Deferred income taxes

The analysis of deferred tax assets and deferred tax liabilities is as follows:

(Million Baht)

| As at 31 December | Consolidated financial statements | | Separate financial statements | |
|--------------------------|--------------------------------------|------|----------------------------------|------|
| | 2019 | 2018 | 2019 | 2018 |
| Deferred tax assets | 671 | 629 | 557 | 516 |
| Deferred tax liabilities | (125) | (37) | - | - |
| Deferred tax assets, net | 546 | 592 | 557 | 516 |

(Million Baht)

| As at 31 December | Consolidated financial statements | | Separate financial statements | |
|--|--------------------------------------|-------|----------------------------------|-------|
| | 2019 | 2018 | 2019 | 2018 |
| Deferred tax assets: | | | | |
| Deferred tax assets to be recovered | | | | |
| within 12 months | 3 | 55 | - | - |
| Deferred tax assets to be recovered | | | | |
| after more than 12 months | 940 | 737 | 900 | 708 |
| | 943 | 792 | 900 | 708 |
| Deferred tax liabilities: | | | | |
| Deferred tax liabilities to be settled | | | | |
| within 12 months | (51) | (54) | (55) | (50) |
| Deferred tax liabilities to be settled | | | | |
| after more than 12 months | (346) | (146) | (288) | (142) |
| | (397) | (200) | (343) | (192) |
| Deferred tax assets, net | 546 | 592 | 557 | 516 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

The movements of deferred tax assets and deferred tax liabilities is as follows:

(Million Baht)

| | Consolidated financial statements | | Separate financial statements | |
|--|--------------------------------------|------|----------------------------------|------|
| | 2019 | 2018 | 2019 | 2018 |
| At 1 January | 592 | 498 | 516 | 481 |
| Charged/(credited) to profit or loss (Note 32) | (103) | 94 | (3) | 35 |
| Charged to other comprehensive income | 57 | - | 44 | - |
| At 31 December | 546 | 592 | 557 | 516 |

The movements in deferred tax assets and liabilities during the year is as follows:

(Million Baht)

| | Consolidated financial statements | | | |
|---------------------------------------|-----------------------------------|-----------------------------------|--------|-------|
| | Employee benefit obligation | Impairment losses on assets | Others | Total |
| Deferred tax assets | | | | |
| At 1 January 2019 | 717 | 2 | 73 | 792 |
| Charged/(credited) to profit or loss | 127 | (2) | (47) | 78 |
| Charged to other comprehensive income | 73 | - | - | 73 |
| At 31 December 2019 | 917 | - | 26 | 943 |
| At 1 January 2018 | 703 | 2 | 20 | 725 |
| Charged to profit or loss | 14 | - | 53 | 67 |
| At 31 December 2018 | 717 | 2 | 73 | 792 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

(Million Baht)

| | Consolidated financial statements | | | | |
|--|-----------------------------------|-------------------|--------------------------------|--------|-------|
| | Depreciation | Borrowing cost | Deferred cost of debentures | Others | Total |
| Deferred tax liabilities | | | | | |
| At 1 January 2019 | (153) | - | (28) | (19) | (200) |
| Charged to profit or loss | (27) | (143) | (11) | - | (181) |
| Charged to other comprehensive income | - | - | - | (16) | (16) |
| At 31 December 2019 | (180) | (143) | (39) | (35) | (397) |
| At 1 January 2018 | (204) | - | - | (23) | (227) |
| (Charged)/credited to profit or loss | 51 | - | (28) | 4 | 27 |
| At 31 December 2018 | (153) | - | (28) | (19) | (200) |

(Million Baht)

| | Separate financial statements | | |
|---------------------------------------|-----------------------------------|-----------------------------------|-------|
| | Employee benefit obligation | Impairment losses on assets | Total |
| Deferred tax assets | | | |
| At 1 January 2019 | 706 | 2 | 708 |
| Charged/(credited) to profit or loss | 134 | (2) | 132 |
| Charged to other comprehensive income | 60 | - | 60 |
| At 31 December 2019 | 900 | - | 900 |
| At 1 January 2018 | 693 | 2 | 695 |
| Charged to profit or loss | 13 | - | 13 |
| At 31 December 2018 | 706 | 2 | 708 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

(Million Baht)

| | Separate financial statements | | | | |
|---------------------------------------|-------------------------------|-------------------|--------------------------------|--------|-------|
| | Depreciation | Borrowing cost | Deferred cost of debentures | Others | Total |
| Deferred tax liabilities | | | | | |
| At 1 January 2019 | (153) | - | (34) | (5) | (192) |
| (Charged)/credited to profit or loss | 50 | (169) | (15) | (1) | (135) |
| Charged to other comprehensive income | - | - | - | (16) | (16) |
| At 31 December 2019 | (103) | (169) | (49) | (22) | (343) |
| At 1 January 2018 | (204) | - | - | (10) | (214) |
| (Charged)/credited to profit or loss | 51 | - | (34) | 5 | 22 |
| At 31 December 2018 | (153) | - | (34) | (5) | (192) |

Deferred income tax assets are recognised for tax loss carried forwards only to the extent that realisation of the related tax benefit through the future taxable profits is probable. The Group did not recognise deferred income tax assets of Baht 448 million (2018: Baht 474 million) in respect of losses amounting to Baht 2,242 million (2018: Baht 2,370 million) that can be carried forward against future taxable income. Losses amounting to Baht 2,242 million will expire during 2020 to 2024 (2018: Baht 2,370 million will expire during 2019 to 2023).

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

20 Short-term loans from financial institutions

Short-term loans from financial institutions for the Group and the Company are as follows:

(Million Baht)

| As at 31 December | Consolidated financial statements | | Separate financial statements | |
|--|--------------------------------------|-------|----------------------------------|------|
| | 2019 | 2018 | 2019 | 2018 |
| Short-term loans from financial institutions | | | | |
| - Secured | 722 | 1,365 | - | - |
| - Unsecured | 854 | 1,027 | - | - |
| Total short-term loans from financial institutions | 1,576 | 2,392 | - | - |

Movements of short-term loans from financial institutions for the Group and the Company are as follows:

(Million Baht)

| For the year ended 31 December | Consolidated financial statements | | Separate financial statements | |
|----------------------------------|--------------------------------------|----------|----------------------------------|----------|
| | 2019 | 2018 | 2019 | 2018 |
| Opening balance | 2,392 | 969 | - | - |
| <u>Cash flows:</u> | | | | |
| Proceeds from short-term loans | 6,990 | 29,127 | - | 18,990 |
| Repayments of short-term loans | (7,806) | (27,623) | - | (18,990) |
| <u>Other non-cash movements:</u> | | | | |
| Other changes | - | (81) | - | - |
| Closing balance | 1,576 | 2,392 | - | - |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

As at 31 December 2019, short-term loans from financial institutions represented promissory notes of the subsidiaries which denominated in Thai Baht amounting to Baht 1,416 million, Vietnamese Dong 115,195 million (equivalent to Baht 150 million) and Indonesian Rupiah 4,719 million (equivalent to Baht 10 million), and bore interest at rates of 2.40% to 10.00% per annum (2018: subsidiaries' short-term loans denominated in Thai Baht amounting to Baht 2,135 million and Vietnamese Dong 183,668 million (equivalent to Baht 257 million), and bore interest at rates of 2.25% to 7.12% per annum).

These short-term loans of subsidiaries are secured and jointed collateral with the long-term loans under the terms and condition in the Credit Facilities Agreement as detailed in note 23.

21 Trade accounts payable

(Million Baht)

| | Consolidated financial statements | | Separate financial statements | |
|---------------------------|--------------------------------------|--------|----------------------------------|--------|
| | 2019 | 2018 | 2019 | 2018 |
| As at 31 December | | | | |
| Related parties (Note 39) | 13,562 | 10,595 | 16,002 | 12,726 |
| Other parties | 11,453 | 11,249 | 11,132 | 10,791 |
| Total | 25,015 | 21,844 | 27,134 | 23,517 |

22 Other payables

(Million Baht)

| | Consolidated financial statements | | Separate financial statements | |
|----------------------------|--------------------------------------|-------|----------------------------------|-------|
| | 2019 | 2018 | 2019 | 2018 |
| As at 31 December | | | | |
| Accrued operating expenses | 173 | 103 | 17 | 39 |
| Oil Fuel Fund payable | 45 | 517 | 45 | 517 |
| Other payables | 7,270 | 1,739 | 7,657 | 2,133 |
| Others | 1,618 | 1,513 | 812 | 886 |
| Total | 9,106 | 3,872 | 8,531 | 3,575 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

23 Long-term loans from financial institutions and a third party

Long-term loans from financial institutions and a third party are as follows:

(Million Baht)

| As at 31 December | Consolidated financial statements | | Separate financial statements | |
|--|--------------------------------------|--------|----------------------------------|------|
| | 2019 | 2018 | 2019 | 2018 |
| Current portion of long-term loans from financial institutions, net | | | | |
| - Secured | 909 | 863 | - | - |
| - Unsecured | 427 | 685 | - | - |
| Long-term loans from financial institutions, net | | | | |
| - Secured | 12,679 | 13,587 | - | - |
| - Unsecured | 1,206 | 1,252 | - | - |
| Long-term loans from a third party | | | | |
| - Unsecured | 219 | 216 | - | - |
| Total long-term loans | 15,440 | 16,603 | - | - |

Movements of long-term loans from financial institutions and a third party are as follows:

(Million Baht)

| For the year ended 31 December | Consolidated financial statements | | Separate financial statements | |
|--|--------------------------------------|---------|----------------------------------|------|
| | 2019 | 2018 | 2019 | 2018 |
| Opening balance | 16,603 | 9,660 | - | - |
| <u>Cash flows:</u> | | | | |
| Proceeds from long-term loans | 112 | 14,944 | - | - |
| Repayments of long-term loans | (1,265) | (8,007) | - | - |
| <u>Other non-cash movements:</u> | | | | |
| Amortisation of deferred financing fee | 12 | 6 | - | - |
| Exchange differences | (22) | - | - | - |
| Closing balance | 15,440 | 16,603 | - | - |

The weighted average effective interest rate of the long-term loans from financial institutions and a third party of the Group were 3.51% per annum (2018: 3.28% per annum).

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

The detail of long-term loans of the Group are as follows:

| No. | Currency in agreement | Outstanding balance as at 31 December | | | | Interest rate per annum (%) | Principal repayment term | Interest payment period |
|-------|-----------------------|---------------------------------------|----------------------------|-----------------------------|----------------------------|-----------------------------------|------------------------------|------------------------------|
| | | 2019 | | 2018 | | | | |
| | | Original Currency (Million) | Equivalent to Million Baht | Original Currency (Million) | Equivalent to Million Baht | | | |
| 1 | Baht | 588 | 588 | 688 | 688 | MLR minus a certain margin | Semi-Annual | Semi-Annual |
| 2 | Baht | 75 | 75 | 125 | 125 | MLR minus a certain margin | Semi-Annual | Semi-Annual |
| 3 | Baht | 588 | 588 | 804 | 804 | FDR (6M) plus a certain margin | Semi-Annual | Semi-Annual |
| 4 | Baht | 32 | 32 | 72 | 72 | FDR (6M) plus a certain margin | Semi-Annual | Semi-Annual |
| 5 | Baht | 7,921 | 7,921 | 8,209 | 8,209 | THBFIX (3M) plus a certain margin | Semi-Annual | Quarterly |
| 6 | Baht | 797 | 797 | 796 | 796 | FDR (6M) plus a certain margin | Quarterly | Quarterly |
| 7 | Baht | 4,838 | 4,838 | 5,374 | 5,374 | THBFIX (3M) plus a certain margin | Semi-Annual | Monthly |
| 8 | Vietnamese Dong | 245,737 | 320 | 228,506 | 319 | Fixed rate | Semi-Annual | Semi-Annual |
| 9 | Baht | 219 | 219 | 216 | 216 | THBFIX (3M) plus a certain margin | A specified in the agreement | A specified in the agreement |
| 10 | Baht | 41 | 41 | - | - | MLR minus a certain margin | Semi-Annual | Semi-Annual |
| 11 | Baht | 21 | 21 | - | - | MLR minus a certain margin | Semi-Annual | Semi-Annual |
| Total | | | 15,440 | | 16,603 | | | |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

The Group's long-term loans are secured by collateral of land, building, petrochemical plants, machinery, crew boats and deposits at financial institutions (Note 7, Note 8 and Note 16) in accordance with the Credit Facilities Agreement.

The Group is required to comply with certain criteria and conditions; for example, maintaining shareholders' portion, maintaining debt to equity ratio at the level as specified in the contract and providing financial supports based on ownership percentage.

The interest rate exposure on the long-term loans from financial institutions and a third party of the Group and the Company is as follows:

| (Million Baht) | | | | |
|-----------------------|--------------------------------------|--------|----------------------------------|------|
| As at 31 December | Consolidated financial statements | | Separate financial statements | |
| | 2019 | 2018 | 2019 | 2018 |
| Long-term loans | | | | |
| - at fixed rate | 320 | 319 | - | - |
| - at floating rate | 15,120 | 16,284 | - | - |
| Total long-term loans | 15,440 | 16,603 | - | - |

Maturity of long-term loans from financial institutions and a third party is as follows:

| (Million Baht) | | | | |
|--|--------------------------------------|--------|----------------------------------|------|
| As at 31 December | Consolidated financial statements | | Separate financial statements | |
| | 2019 | 2018 | 2019 | 2018 |
| Not later than one year | 1,336 | 1,549 | - | - |
| Later than 1 year but not later than 5 years | 4,970 | 5,049 | - | - |
| Later than 5 years | 9,134 | 10,005 | - | - |
| Total long-term loans | 15,440 | 16,603 | - | - |

As at 31 December 2019, the Group and the Company had available credit facilities from financial institutions amounting to Baht 5,209 million and 4,000 million, respectively (2018: Baht 6,039 million and 4,700 million, respectively).

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

24 Debentures, net

(Million Baht)

| As at 31 December | Consolidated financial statements | | Separate financial statements | |
|--|--------------------------------------|---------|----------------------------------|---------|
| | 2019 | 2018 | 2019 | 2018 |
| Debentures, net | 97,727 | 88,729 | 32,292 | 36,180 |
| <u>Less</u> Discount on debenture | (543) | (664) | (163) | (171) |
| | 97,184 | 88,065 | 32,129 | 36,009 |
| <u>Less</u> Current portion of debentures, net | - | (3,000) | - | (3,000) |
| Debentures, net | 97,184 | 85,065 | 32,129 | 33,009 |

Movements of debentures of the Group and the Company are as follows:

(Million Baht)

| For the year ended 31 December | Consolidated financial statements | | Separate financial statements | |
|-----------------------------------|--------------------------------------|----------|----------------------------------|----------|
| | 2019 | 2018 | 2019 | 2018 |
| Opening balance | 88,065 | 55,839 | 36,009 | 55,839 |
| <u>Cash flows:</u> | | | | |
| Additions | 17,037 | 51,634 | - | - |
| Repayments | (3,000) | (20,076) | (3,000) | (20,076) |
| Financing fee | (55) | - | - | - |
| <u>Other non-cash movements:</u> | | | | |
| Interest of discount on debenture | 14 | 325 | 8 | 321 |
| Exchange differences | (4,877) | 343 | (888) | (75) |
| Closing balance | 97,184 | 88,065 | 32,129 | 36,009 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Debentures issued by the Company and a subsidiary are unsecured and unsubordinated. The debentures issued by a subsidiary are fully guaranteed by the Company. Detail are as follows:

| Consolidated financial statements | | | | | | | |
|-----------------------------------|------------------|-------|------------|-------------------|-------------------|---------------------------|--------------------------|
| Issuance date | Maturity date | Years | Currency | 2019 (Million) | 2018 (Million) | Interest rate (% p.a.) | Interest payment term |
| 12 March 2014 | 12 March 2019 | 5 | Baht | - | 3,000 | 4.13 | Semi-annual basis |
| 30 April 2010 | 30 April 2022 | 12 | Baht | 3,000 | 3,000 | 4.80 | Semi-annual basis |
| 23 March 2012 | 23 March 2027 | 15 | Baht | 7,500 | 7,500 | 5.05 | Semi-annual basis |
| 23 January 2013 | 23 January 2023 | 10 | US Dollars | 216.4 | 216.4 | 3.625 | Semi-annual basis |
| 23 January 2013 | 23 January 2043 | 30 | US Dollars | 172.4 | 172.4 | 4.875 | Semi-annual basis |
| 12 March 2014 | 12 March 2021 | 7 | Baht | 3,000 | 3,000 | 4.61 | Semi-annual basis |
| 12 March 2014 | 12 March 2024 | 10 | Baht | 7,000 | 7,000 | 4.84 | Semi-annual basis |
| 10 April 2018 | 23 January 2023 | 10 | US Dollars | 283.6 | 283.6 | 3.625 | Semi-annual basis |
| 10 April 2018 | 23 January 2043 | 30 | US Dollars | 327.6 | 327.6 | 4.875 | Semi-annual basis |
| 20 November 2018 | 20 November 2028 | 10 | US Dollars | 400 | 400 | 4.625 | Semi-annual basis |
| 20 November 2018 | 20 November 2048 | 30 | US Dollars | 600 | 600 | 5.375 | Semi-annual basis |
| 17 October 2019 | 17 October 2049 | 30 | US Dollars | 565 | - | 3.50 | Semi-annual basis |

| Separate financial statements | | | | | | | |
|-------------------------------|-----------------|-------|------------|-------------------|-------------------|---------------------------|--------------------------|
| Issuance date | Maturity date | Years | Currency | 2019 (Million) | 2018 (Million) | Interest rate (% p.a.) | Interest payment term |
| 30 April 2010 | 30 April 2022 | 12 | Baht | 3,000 | 3,000 | 4.80 | Semi-annual basis |
| 23 March 2012 | 23 March 2027 | 15 | Baht | 7,500 | 7,500 | 5.05 | Semi-annual basis |
| 23 January 2013 | 23 January 2023 | 10 | US Dollars | 216.4 | 216.4 | 3.625 | Semi-annual basis |
| 23 January 2013 | 23 January 2043 | 30 | US Dollars | 172.4 | 172.4 | 4.875 | Semi-annual basis |
| 12 March 2014 | 12 March 2021 | 7 | Baht | 3,000 | 3,000 | 4.61 | Semi-annual basis |
| 12 March 2014 | 12 March 2024 | 10 | Baht | 7,000 | 7,000 | 4.84 | Semi-annual basis |

The Company and a subsidiary are required to comply with certain procedures and conditions; for example, maintaining shareholders' portion at the level as specified in the contract.

The weighted average effective interest rate of the debentures of the Group and the Company is 4.50% per annum (2018: 4.71% per annum) and 4.62% per annum (2018: 4.61% per annum), respectively.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

25 Employee benefit obligations

The movement in the defined benefit obligation over the year is as follows:

(Million Baht)

| | Consolidated financial statements | | Separate financial statements | |
|----------------------|--------------------------------------|-------|----------------------------------|-------|
| | 2019 | 2018 | 2019 | 2018 |
| At 1 January | 3,587 | 3,511 | 3,183 | 3,161 |
| Current service cost | 344 | 305 | 249 | 244 |
| Past service cost | 379 | - | 301 | - |
| Actuarial losses | 385 | 1 | 326 | - |
| Benefit payment | (109) | (230) | (104) | (222) |
| At 31 December | 4,586 | 3,587 | 3,955 | 3,183 |

Actuarial losses recognised in other comprehensive income arising from:

(Million Baht)

| | Consolidated financial statements | | Separate financial statements | |
|-------------------------|--------------------------------------|------|----------------------------------|------|
| | 2019 | 2018 | 2019 | 2018 |
| Demographic assumptions | - | 1 | - | - |
| Financial assumptions | 364 | - | 305 | - |
| Total | 364 | 1 | 305 | - |

On 5 April 2019, an amendment bill to the Labour Protection Law was published in the Government Gazette. The amended law will become effective 30 days after its publication. The main amendment is that the compensation for employees who have retired and have more than or equal to 20 years of service has changed from 300 day's pay to 400 day's pay. The effects of the amendment were recognised as past service cost during the year.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

The principal actuarial assumptions used were as follows:

| | Consolidated financial statements | | Separate financial statements | |
|-----------------------|--------------------------------------|------------|----------------------------------|------------|
| | 2019 | 2018 | 2019 | 2018 |
| Discount rate | 2.0% | 3.0% | 2.0% | 3.0% |
| Salary increases rate | 5.0%-10.0% | 5.0%-10.0% | 5.0%-10.0% | 5.0%-10.0% |
| Employee turnover | 0.0%-4.0% | 0.0%-4.0% | 0.0%-4.0% | 0.0%-4.0% |

Assumptions regarding future mortality have been based on published statistics and mortality tables.

Sensitivity analysis for each significant assumption used is as follows:

| | Consolidated financial statements | | | | | |
|--------------------|--------------------------------------|------|------------------------|--------------|------------------------|--------------|
| | Impact on defined benefit obligation | | | | | |
| | Change in assumption | | Increase in assumption | | Decrease in assumption | |
| | 2019 | 2018 | 2019 | 2018 | 2019 | 2018 |
| | % | % | Million Baht | Million Baht | Million Baht | Million Baht |
| Discount rate | 1 | 1 | (414) | (299) | 460 | 350 |
| Salary growth rate | 1 | 1 | 512 | 403 | (448) | (354) |

| | Separate financial statements | | | | | |
|--------------------|--------------------------------------|------|------------------------|--------------|------------------------|--------------|
| | Impact on defined benefit obligation | | | | | |
| | Change in assumption | | Increase in assumption | | Decrease in assumption | |
| | 2019 | 2018 | 2019 | 2018 | 2019 | 2018 |
| | % | % | Million Baht | Million Baht | Million Baht | Million Baht |
| Discount rate | 1 | 1 | (326) | (247) | 356 | 285 |
| Salary growth rate | 1 | 1 | 441 | 362 | (390) | (319) |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

The above sensitivity analysis are based on a change in an assumption while all other assumptions remain constant. In practice, this is unlikely to occur, and changes in some of the assumptions may be correlated. When calculating the sensitivity of the defined benefit obligation to significant actuarial assumptions the same method which is the present value of the defined benefit obligation calculated with the projected unit credit method at the end of the reporting period has been applied when calculating the pension liability recognised within the consolidated statement of financial position. The methods and types of assumptions used in preparing the sensitivity analysis did not change when compared to the previous period.

The weighted average employee benefit obligations of the Group is 19 years (2018: 19 years).

26 Share capital and premium on share capital

| | Number of shares | Ordinary shares | Share premium | Total |
|------------------------------|---------------------|--------------------|------------------|--------|
| At 31 December 2019 and 2018 | 2,040 | 20,400 | 2,456 | 22,856 |

(Million Baht)

The total number of authorised ordinary shares is 2,040 million shares with a par value of Baht 10 per share. All issued shares are fully paid-up.

Section 51 of the Public Companies Act B.E. 2535 requires companies to set aside share subscription monies received in excess of the par value of the shares issued to a reserve account (share premium). Share premium is not available for dividend distribution.

27 Legal reserve

Under the Public Limited Company Act., B.E. 2535, the Company is required to set aside as a legal reserve at least 5% of its net profit after accumulated deficit brought forward (if any) until the reserve is not less than 10% of the registered capital. The legal reserve is non-distributable.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

28 Non-controlling interests

Movement of non-controlling interests are as follows:

| For the year ended 31 December | (Million Baht) | |
|--|-----------------------------------|-------|
| | Consolidated financial statements | |
| | 2019 | 2018 |
| Opening balance | 4,760 | 4,925 |
| Changes in shareholding interest in a subsidiary | - | (101) |
| Addition from business combination (Note 40) | 13 | - |
| Dividend payment from subsidiaries | (240) | (297) |
| Share of total comprehensive income from subsidiaries | 233 | 233 |
| Deficit from the changes in net assets in an associate | (815) | - |
| Closing balance | 3,951 | 4,760 |

Changes in net assets in an associate

As mentioned in note 14, the Group recognised deficit from the changes in the net assets in an associate resulting from the change in ownership interest in GLOW in an amount of Baht 4,452 million and shares issuance cost in an amount of Baht 29 million in the shareholder's equity, resulting in the recognition of deficit to non-controlling interests totalling Baht 815 million.

29 Other income

| For the year ended 31 December | (Million Baht) | | | |
|--------------------------------|-----------------------------------|-------|-------------------------------|-------|
| | Consolidated financial statements | | Separate financial statements | |
| | 2019 | 2018 | 2019 | 2018 |
| Land lease income | 14 | 20 | 88 | 92 |
| Interest income | 1,164 | 1,381 | 1,344 | 1,618 |
| Service income and others | 399 | 318 | 2,035 | 1,994 |
| Total | 1,577 | 1,719 | 3,467 | 3,704 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

30 Employee benefit expenses

| For the year ended 31 December | (Million Baht) | | | |
|---------------------------------|--------------------------------------|--------------|----------------------------------|--------------|
| | Consolidated financial statements | | Separate financial statements | |
| | 2019 | 2018 | 2019 | 2018 |
| Management | | | | |
| Salaries and wages | 216 | 223 | 172 | 170 |
| Contributions to provident fund | 20 | 21 | 17 | 16 |
| Retirement gratuity fund | 16 | 17 | 16 | 17 |
| Other | 101 | 126 | 91 | 113 |
| | 353 | 387 | 296 | 316 |
| Other employees | | | | |
| Salaries and wages | 2,617 | 2,464 | 1,290 | 1,385 |
| Contributions to provident fund | 138 | 142 | 90 | 99 |
| Retirement gratuity fund | 362 | 148 | 362 | 144 |
| Other | 670 | 439 | 471 | 360 |
| | 3,787 | 3,193 | 2,213 | 1,988 |
| Total | 4,140 | 3,580 | 2,509 | 2,304 |

The Group established an employees' registered provident fund in which the employees contribute monthly at rates ranging from 3% to 15% of their basic salaries and the Group contributes monthly at rates ranging from 3% to 15% of the employees' basic salaries. The provident funds are registered with the Ministry of Finance as juristic entities and are managed by licensed Fund Managers.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

31 Expenses by nature

The statement of income includes an analysis of expenses by function. Significant expenses by nature are detailed as follows:

| For the year ended 31 December | (Million Baht) | | | |
|--|--------------------------------------|---------|----------------------------------|---------|
| | Consolidated financial statements | | Separate financial statements | |
| | 2019 | 2018 | 2019 | 2018 |
| Changes in finished goods and work in progress | 1,789 | 2,400 | 2,489 | 2,112 |
| Purchase and raw materials used | 255,705 | 282,928 | 292,519 | 323,252 |
| Natural gas used | 10,684 | 10,677 | 2,060 | 2,214 |
| Employee benefit expenses | 4,141 | 3,580 | 2,509 | 2,304 |
| Depreciation and amortisation | 7,085 | 7,264 | 3,747 | 3,788 |
| Excise tax | 65,172 | 57,313 | 65,124 | 57,256 |
| Oil fuel fund contribution/ Energy conservation fund contribution | 4,391 | 2,822 | 4,391 | 2,822 |

32 Income tax expense

| For the year ended 31 December | (Million Baht) | | | |
|--|--------------------------------------|-------|----------------------------------|------|
| | Consolidated financial statements | | Separate financial statements | |
| | 2019 | 2018 | 2019 | 2018 |
| <u>Current tax:</u> | | | | |
| Current tax on profits for the year | 1,139 | 2,078 | 529 | 991 |
| Adjustments in respect of prior year | (3) | (1) | (6) | (1) |
| Total current tax | 1,136 | 2,077 | 523 | 990 |
| <u>Deferred tax:</u> | | | | |
| Changes from temporary differences (Note 19) | 103 | (94) | 3 | (35) |
| Income tax expense | 1,239 | 1,983 | 526 | 955 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

The tax on the Group's profit before income tax expense differs from the theoretical amount that would arise using the basic weighted average tax rate applicable to profit of the home country of the Company are as follows:

| (Million Baht) | | | | |
|--|--------------------------------------|--------|----------------------------------|-------|
| For the year ended 31 December | Consolidated financial statements | | Separate financial statements | |
| | 2019 | 2018 | 2019 | 2018 |
| Profit before income tax expense | 7,756 | 12,367 | 5,182 | 9,195 |
| Tax calculated at a tax rate of | 20 | 20 | 20 | 20 |
| The result of the accounting profit multiplied by the income tax rate | 1,551 | 2,473 | 1,036 | 1,839 |
| Tax effect of: | | | | |
| Income not subject to tax | (333) | (517) | (520) | (896) |
| Expenses not deductible for tax purpose | 32 | 29 | 16 | 13 |
| Tax losses for which no deferred income tax asset was recognised | (8) | (1) | - | - |
| Adjustments in respect of prior year | (3) | (1) | (6) | (1) |
| Income tax expense | 1,239 | 1,983 | 526 | 955 |

The weighted average applicable tax rate of the Group and Company were 15.98% and 10.15%, respectively (2018: 16.03% and 10.38%, respectively).

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Revenues, profit before finance costs and income tax expense, and income tax expense from operation in foreign countries of the Group for the year ended 31 December 2019 are as follow:

(Million Baht)

| | Revenues ⁽¹⁾ | Profit before finance costs and income tax expense | Income tax expense |
|--------------------------|-------------------------|---|-----------------------|
| Thailand | 365,178 | 11,032 | 1,239 |
| Vietnam ⁽²⁾ | 2,989 | 23 | - |
| Indonesia | 26 | (8) | - |
| Singapore ⁽³⁾ | - | 16 | - |
| Total | 368,193 | 11,063 | 1,239 |

Notes:

⁽¹⁾ Revenues subject to tax consist of revenue from sale of services, subsidy from oil fuel fund, dividend income, net derivative gain on hedging, net foreign exchange gain, and other income.

⁽²⁾ No income tax expense due to unutilised tax losses brought forward from the previous year.

⁽³⁾ No income tax expense due to tax exemption for specific business by the government of Singapore.

33 Promotional privileges

Certain local subsidiaries have been granted privileges by the Board of Investment relating to power and steam generation, petrochemical product production, chemical product production, ethanol product production, marine transportation, offshore crude oil unloading facilities and industrial zone. The summary of privileges granted are as follows:

- (a) an exemption from payment of import duty and tax on machinery and equipment as approved by the Board of Investment.
- (b) an exemption from payment of corporate income tax for promoted operations for periods of 7 to 8 years from the dates on which the income is first derived from such operations or 8 years from the date on which the income is received subsequent to when the privileges were granted.
- (c) a 50% reduction in the normal corporate income tax rate on the net profit derived from certain promotional operations for a period of 5 years, commencing from the expiry date in (b) above.

As promoted companies, the subsidiaries must comply with certain conditions and restrictions provided for in the promotional certificates.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Revenues from promoted businesses were as follows:

| | (Million Baht) | |
|-----------------------------------|--------------------------------------|--------|
| | Consolidated financial statements | |
| | 2019 | 2018 |
| Revenues from promoted businesses | 27,946 | 34,117 |

34 Basic earnings per share

Basic earnings per share is calculated by dividing the net profit attributable to the shareholders of the Company by the weighted average number of ordinary shares issued during the year.

| | Consolidated financial statements | | Separate financial statements | |
|---|--------------------------------------|--------|----------------------------------|-------|
| | 2019 | 2018 | 2019 | 2018 |
| Net profit attributable to the ordinary shareholders of the Company (Million Baht) | 6,277 | 10,149 | 4,655 | 8,240 |
| Weighted average number of ordinary shares outstanding (Million shares) | 2,040 | 2,040 | 2,040 | 2,040 |
| Basic earnings per share (Baht per share) | 3.08 | 4.97 | 2.28 | 4.04 |

The Group did not have any potential dilutive ordinary shares issued during the year ended 31 December 2019 and 2018, so there is no presentation of diluted earning per share.

35 Dividends

At the Board of the Director meeting of the Company held on 30 August 2019, the Company's Board of Directors approved the appropriation of interim dividends in respect of the operating results for the first six-month period of 2019 at Baht 1.00 per share, totalling Baht 2,040 million. The interim dividends were paid to the Company's shareholders on 27 September 2019.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

At the Annual General Shareholders meeting of the Company held on 10 April 2019, the shareholders approved the payment of dividends in respect of the operating result of 2018 at Baht 2.65 per share, totalling Baht 5,406 million. After a deduction of the interim dividends of Baht 1.50 per share which were paid to the Company's shareholders in September 2018, the dividends remained for distribution were Baht 1.15 per share, totalling Baht 2,346 million. The dividends were paid to the shareholders on 26 April 2019.

36 Commitments and contingencies

(Million Baht)

| | Consolidated financial statements | | Separate financial statements | |
|--|--------------------------------------|--------|----------------------------------|--------|
| | 2019 | 2018 | 2019 | 2018 |
| Capital commitments | | | | |
| Project construction agreements | 69,362 | 4,162 | 69,190 | 4,051 |
| Total | 69,362 | 4,162 | 69,190 | 4,051 |
| Non-cancellable operating lease commitments | | | | |
| Within one year | 1,534 | 238 | 1,501 | 231 |
| After one year but within five years | 3,529 | 1,418 | 3,442 | 1,390 |
| After five years | 17,761 | 17,724 | 17,521 | 17,591 |
| Total | 22,824 | 19,380 | 22,464 | 19,212 |
| Other commitments | | | | |
| Letters of guarantee issued by | | | | |
| financial institutions | 2,065 | 2,007 | 1,457 | 1,426 |
| Forward foreign exchange contracts | 2,905 | 2,806 | 2,905 | 2,806 |
| Crude oil purchase agreements | 54,180 | 44,543 | 54,180 | 44,543 |
| Total | 59,150 | 49,356 | 58,542 | 48,775 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Investment in Clean Fuel Project

The Company has engaged contractors for construction of Clean Fuel Project (CFP) which has been approved in the Extraordinary General Meeting of Shareholders held on 27 August 2018, with the investment project value of not exceeding US Dollar 4,825 million or equivalent to Baht 160,279 million. The project cost includes the investment of Energy Recovery Unit (ERU). The ERU is an electrical power plant, with the designed generating capacity of 250 megawatts and steam, to supply the production process of the CFP.

Power Purchase Agreements

Two subsidiaries have power purchase agreements for a period of 25 years with the Electricity Generating Authority of Thailand (EGAT) expiring in 2023 and 2041 whereby the subsidiaries will supply the electric energy to EGAT at the agreed quantity and price. As the contracted party with EGAT, the subsidiaries must comply with conditions and restrictions provided for in the agreements.

Joint Venture Agreement on Leasing State Properties

On 21 August 2018, the Company has signed an agreement on leasing state properties with Ministry of Finance. The Company agrees to pay rental annually for the period of 30 years from 2022 until 2052.

On the signing date, the Company paid up-front fee amounting to Baht 2,962 million.

Interest Rate Swap Contracts

A subsidiary has entered into interest rate swap contracts with various financial institutions to manage exposure and fluctuations in interest rate on long-term loans in Thai Baht. As at 31 December 2019, a subsidiary had notional amount of Baht 6,019 million (2018: Baht 6,241 million), whereby exchanging floating interest rate based on THBFIX 3M plus certain fixed margin per annum with fixed interest rate. The swap contracts are effective from April 2018 to March 2028.

Long-term Maintenance Agreements

Subsidiaries have long-term supply and maintenance power generator agreements with a local company and a foreign company (service providers) for a period of 14 years and 15 years, whereby the service providers shall supply and repair parts used for yearly and scheduled repairs. Subsidiaries have commitments to pay for the parts and maintenance service fees to the service provider at the prices as specified in the agreements. The agreements are effective on 1 June 2016 and 14 December 2018.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

37 Contingent liabilities and contingent assets

As at 31 December 2019, the contingent liabilities and contingent assets of the Company are as follows:

The Company has oil price crack spread swap with foreign companies and related parties (counterparties). The Company has or the counterparties have commitments to make payments for the differences between the fixed price and floating price of each period.

As at 31 December 2019, the Company had oil volume under the agreements totalling 1.57 million barrels (2018: 1.10 million barrels).

38 Insurance policy

As at 31 December 2019, the Group has an All Risks and Business Interruption (BI) from a syndicate of insurers and reinsurers for a total insured value of US Dollars 22,751 million (2018: US Dollars 15,168 million). Such policy is renewed on an annual basis. Certain subsidiaries have assigned their rights to proceeds from insurance claims under the BI to the lenders under certain borrowings agreements.

39 Related party transaction

Individuals and entities that directly or indirectly control or are controlled by or are under common control with the Company, including investment entities, associates, joint venture and individuals or entities having significant influence over the Company, key management personnel, including directors and officers of the Company and close members of the family of these individuals and entities associated with these individuals also constitute related parties.

In considering each possible related-party relationship, attention is directed to the substance of the relationship, and not merely the legal form.

The Company is an entity in the PTT Public Company Limited (PTT) group of companies. PTT is incorporated in Thailand and is the major shareholder and the parent of the Company. PTT owned 47.53% of the Company's issued and paid-up share capital as at 31 December 2019 (2018: 48.03%).

Details of subsidiaries, joint ventures and associates were disclosed in note 13 and note 14.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Relationships with key management and other related parties were as follows:

| Name of entities | Country of incorporation | Nature of relationships |
|---------------------------------------|--------------------------|---|
| PTT Public Company Limited | Thailand | Parent company |
| Thai Paraxylene Co., Ltd. | Thailand | Subsidiary and/or common directors |
| Thai Lube Base Public Company Limited | Thailand | Subsidiary and/or common directors |
| Thaioil Marine Co., Ltd. | Thailand | Subsidiary and/or common directors |
| Thaioil Energy Services Co., Ltd. | Thailand | Subsidiary and/or the Company's management as a director |
| Thaioil Solvent Co., Ltd. | Thailand | Subsidiary and/or common directors |
| TOP Solvent Co., Ltd. | Thailand | Indirect subsidiary and/or the Company's management as a director |
| Sak Chaisidhi Co., Ltd. | Thailand | Indirect subsidiary and/or the Company's management as a director |
| TOP Solvent (Vietnam) LLC. | Vietnam | Indirect subsidiary and/or the Company's management as a director |
| PT. Tirta Surya Raya | Indonesia | Indirect subsidiary |
| Thaioil Ethanol Co., Ltd. | Thailand | Subsidiary and/or the Company's management as a director |
| Thaioil Power Co., Ltd. | Thailand | Subsidiary and/or common directors |
| TOP SPP Co., Ltd. | Thailand | Subsidiary and/or common directors |
| Thaioil Treasury Center Co.,Ltd. | Thailand | Subsidiary and/or the Company's management as a director |
| TOP Ventures Company Limited | Thailand | Indirect subsidiary and/or the Company's management as a director |
| TOP Ventures HK Limited | Hong Kong | Indirect subsidiary and/or the Company's management as a director |
| TOP Ventures America LLC. | USA | Indirect subsidiary and/or the Company's management as a director |
| Sapthip Co., Ltd. | Thailand | Indirect subsidiary and/or the Company's management as a director |
| Sapthip Green Energy Co.,Ltd. | Thailand | Indirect subsidiary and/or the Company's management as a director |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

| Name of entities | Country of incorporation | Nature of relationships |
|---|-----------------------------|--|
| Thaioil Marine International Pte. Ltd. | Singapore | Indirect subsidiary and/or the Company's management as a director |
| TOP Maritime Service Co., Ltd. | Thailand | Indirect subsidiary and/or the Company's management as a director |
| LABIX Co., Ltd. | Thailand | Indirect subsidiary and/or common directors |
| TOP-NTL Pte. Ltd. | Singapore | Joint venture of subsidiary |
| TOP-NTL Shipping Trust | Singapore | Joint venture of subsidiary |
| TOP Nautical Star Co., Ltd. | Thailand | Joint venture of subsidiary and/or the Company's management as a director |
| TOP-NYK MarineOne Pte. Ltd. | Singapore | Joint venture of indirect subsidiary and/or the Company's management as a director |
| PTT Digital Solutions Co., Ltd. | Thailand | Associate and/or the Company's management as a director |
| PTT Energy Solutions Co., Ltd. | Thailand | Associate and/or the Company's management as a director |
| Global Power Synergy Public Company Limited | Thailand | Indirect associate and/or common directors |
| Ubon Bio Ethanol Public Company Limited | Thailand | Indirect associate and/or the Company's management as a director |
| T.I.M. Ship Management Co., Ltd. | Thailand | Indirect associate and/or the Company's management as a director |
| PTT International Trading Pte. Ltd. | Singapore | Subsidiary of the parent company |
| PTT Oil and Retail Business Public Company Limited | Thailand | Subsidiary of the parent company and/or Common directors |
| PTT Exploration and Production Public Company Limited | Thailand | Subsidiary of the parent company |
| PTT Treasury Center Co., Ltd. | Thailand | Subsidiary of the parent company |
| Energy Recovery Unit Co.,Ltd. | Thailand | Indirect subsidiary of the parent company |
| Energy Complex Co., Ltd. | Thailand | Subsidiary of the parent company |
| IRPC Public Company Limited | Thailand | Subsidiary of the parent company |
| PTT Tank Terminal Co., Ltd. | Thailand | Subsidiary of the parent company and/or common directors |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

| Name of entities | Country of incorporation | Nature of relationships |
|---|-----------------------------|--|
| PTT Global Chemical Public Company Limited | Thailand | Subsidiary of the parent company |
| PTT International Trading London Ltd. | England | Subsidiary of the parent company |
| PTT Phenol Co., Ltd. | Thailand | Indirect subsidiary of the parent company |
| PTT Exploration and Production International Company Limited | Thailand | Indirect subsidiary of the parent company |
| PTTEP Energy Development Company Limited | Thailand | Indirect subsidiary of the parent company |
| Solution Creation Co.,Ltd. | Thailand | Indirect subsidiary of the parent company |
| Thai Tank Terminal Ltd. | Thailand | Indirect subsidiary of the parent company |
| Global Green Chemicals Public Company Limited | Thailand | Indirect subsidiary of the parent company |
| Vencorex (Thailand) Co., Ltd. | Thailand | Indirect subsidiary of the parent company |
| Thai Petroleum Pipeline Co., Ltd. | Thailand | Related company and/or the Company's management as a director |
| GC Glycol Co., Ltd. | Thailand | Indirect subsidiary of the parent company |
| Sarn Palung Social Enterprise Co., Ltd. | Thailand | Related company and/or the Company's management as a director |
| PTT MCC Biochem Co., Ltd. | Thailand | Indirect subsidiary of the parent company |
| PTT Oil Myanmar Co.,Ltd. | Myanmar | Indirect subsidiary of the parent company |
| Brighter PTT Oil and Retail Co., Ltd. | Myanmar | Joint venture of subsidiary of the parent company |

The pricing policies for particular types of transactions are explained further below:

| Transactions | Pricing policies |
|---|---|
| Revenue from sale and services, lease income, purchase of goods and assets | Market prices or, where no market price exists, at contractually agreed prices |
| Interest income and expense | Agreed rates as stipulated in the agreements |
| Dividend income | Right to receive dividends |
| Other income and expenses | Contractually agreed prices |
| Directors' remuneration | Amounts approved by the Group's shareholders |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Significant transactions for the year ended 31 December 2019 and 2018 with related parties were as follows:

(Million Baht)

| For the year ended 31 December | Consolidated financial statements | | Separate financial statements | |
|-------------------------------------|--------------------------------------|---------|----------------------------------|---------|
| | 2019 | 2018 | 2019 | 2018 |
| Parent Company | | | | |
| Revenue from sales and services | 1,938 | 84,544 | 1,929 | 82,490 |
| Purchase of crude oil and feedstock | 124,769 | 142,972 | 116,149 | 134,494 |
| Other income | 2 | 9 | 2 | 9 |
| Other expenses | 124 | 118 | 121 | 117 |
| Purchase of assets | 1 | 3 | 1 | - |
| Subsidiaries | | | | |
| Revenue from sales and services | - | - | 61,096 | 75,109 |
| Purchase of crude oil and feedstock | - | - | 42,948 | 49,740 |
| Interest income | - | - | 211 | 276 |
| Dividend income | - | - | 2,136 | 3,917 |
| Land lease income | - | - | 74 | 72 |
| Other income | - | - | 1,812 | 2,334 |
| Interest expense | - | - | 1,051 | 927 |
| Other expenses | - | - | 1,925 | 1,022 |
| Purchase of assets | - | - | 1,056 | 41 |
| Joint ventures | | | | |
| Other expenses | 1,253 | 1,263 | 1,253 | 1,263 |
| Associates | | | | |
| Revenue from sales and services | 4 | 10 | 3 | 6 |
| Purchase of crude oil and feedstock | 434 | 623 | 412 | 622 |
| Dividend income | 596 | - | 192 | 183 |
| Land lease income | 8 | 8 | 8 | 8 |
| Other income | 21 | 21 | 20 | 19 |
| Other expenses | 363 | 289 | 342 | 270 |
| Purchase of assets | 69 | 63 | 69 | 63 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

(Million Baht)

| | Consolidated financial statements | | Separate financial statements | |
|---|--------------------------------------|---------|----------------------------------|--------|
| | 2019 | 2018 | 2019 | 2018 |
| For the year ended 31 December | | | | |
| Other related parties | | | | |
| Revenue from sales and services | 173,782 | 100,564 | 164,868 | 91,517 |
| Purchase of crude oil and feedstock | 17,879 | 10,424 | 13,102 | 4,905 |
| Purchase - sale of crude oil and feedstock for legal reserve | 2,240 | 1,668 | 2,240 | 1,668 |
| Dividend income | 160 | 154 | 160 | 154 |
| Other income | 33 | 7 | 33 | 7 |
| Interest expense | 27 | - | - | - |
| Other expenses | 368 | 368 | 330 | 318 |
| Directors' remuneration | 63 | 79 | 54 | 69 |

Balances as at 31 December 2019 and 2018 with related parties were as follows:

Trade accounts receivable - related parties

(Million Baht)

| | Consolidated financial statements | | Separate financial statements | |
|--|--------------------------------------|--------|----------------------------------|--------|
| | 2019 | 2018 | 2019 | 2018 |
| As at 31 December | | | | |
| Parent company | - | 85 | - | 85 |
| Subsidiaries | - | - | 5,282 | 6,490 |
| Associates | 4 | 5 | 4 | 5 |
| Other related parties | 9,480 | 11,722 | 8,955 | 10,810 |
| | 9,484 | 11,812 | 14,241 | 17,390 |
| Less allowance for doubtful accounts | - | - | - | - |
| Trade accounts receivable - related parties, net | 9,484 | 11,812 | 14,241 | 17,390 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Other accounts receivable - related parties

(Million Baht)

| As at 31 December | Consolidated financial statements | | Separate financial statements | |
|-------------------|--------------------------------------|------|----------------------------------|------|
| | 2019 | 2018 | 2019 | 2018 |
| Parent company | 1 | 1 | 1 | 1 |
| Subsidiaries | - | - | 241 | 327 |
| Associates | 2 | 1 | 2 | 1 |
| Total | 3 | 2 | 244 | 329 |

Short-term loans to related parties

(Million Baht)

| As at 31 December | Consolidated financial statements | | Separate financial statements | |
|-------------------|--------------------------------------|------|----------------------------------|-------|
| | 2019 | 2018 | 2019 | 2018 |
| Subsidiaries* | - | - | 3,221 | 4,274 |
| Total | - | - | 3,221 | 4,274 |

* Please see note 13 for impairment assessment for loan to and investment in a subsidiary.

Interest rates during the year 2019 and 2018 were charged at highest money market rate for short-term loan based on BIBOR 3M plus certain fixed margin per annum.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Movements of short-term loans to related parties during the year ended 31 December 2019 and 2018 were as follows:

| | (Million Baht) | | | |
|----------------------------------|--------------------------------------|------|----------------------------------|----------|
| | Consolidated financial statements | | Separate financial statements | |
| | 2019 | 2018 | 2019 | 2018 |
| At 1 January | - | - | 4,274 | 15,651 |
| <u>Cash flows:</u> | | | | |
| Payments for short-term loans | - | - | 1,029 | 310 |
| Proceeds from short-term loans | - | - | (2,078) | (11,687) |
| <u>Other non-cash movements:</u> | | | | |
| Exchange losses | - | - | (4) | - |
| At 31 December | - | - | 3,221 | 4,274 |

Long-term loans to related parties

| | (Million Baht) | | | |
|-------------------|--------------------------------------|------|----------------------------------|------|
| | Consolidated financial statements | | Separate financial statements | |
| | 2019 | 2018 | 2019 | 2018 |
| As at 31 December | | | | |
| Subsidiaries* | - | - | 11,781 | 400 |
| Total | - | - | 11,781 | 400 |

* Please see note 13 for impairment assessment for loan to and investment in a subsidiary.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Movements of long-term loans to related parties during the year ended 31 December 2019 and 2018 were as follows:

| | (Million Baht) | | | |
|------------------------------|--------------------------------------|------|----------------------------------|------|
| | Consolidated financial statements | | Separate financial statements | |
| | 2019 | 2018 | 2019 | 2018 |
| At 1 January | - | - | 400 | - |
| <u>Cash flows:</u> | | | | |
| Payments for long-term loans | - | - | 11,381 | 400 |
| At 31 December | - | - | 11,781 | 400 |

On 26 September 2019, the Company entered into a loan agreement with a subsidiary at the credit facility amount of Baht 11,385 million. The purpose is to support a subsidiary within the Group to purchase the additional share capital of an associate. The loan has no collateral and bears a fixed interest rate at 2.66% per annum. The agreement is for a period of 4.5 years from the initial drawdown date.

On 14 November 2018, the Company entered into a loan agreement with a subsidiary in an amount of Baht 400 million for financial restructuring. The borrowing bears the interest rate at highest money market rate for short-term loan based on BIBOR 3M plus margin. The agreement is effective for a period of 3 years from signing date.

Trade accounts payable - related parties

| | (Million Baht) | | | |
|-----------------------|--------------------------------------|--------|----------------------------------|--------|
| | Consolidated financial statements | | Separate financial statements | |
| | 2019 | 2018 | 2019 | 2018 |
| As at 31 December | | | | |
| Parent company | 12,309 | 9,546 | 11,598 | 8,093 |
| Subsidiaries | - | - | 3,496 | 3,916 |
| Associates | 26 | 27 | 19 | 23 |
| Other related parties | 1,227 | 1,022 | 889 | 694 |
| Total | 13,562 | 10,595 | 16,002 | 12,726 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Other accounts payable - related parties

| As at 31 December | (Million Baht) | | | |
|-----------------------|--------------------------------------|------|----------------------------------|------|
| | Consolidated financial statements | | Separate financial statements | |
| | 2019 | 2018 | 2019 | 2018 |
| Parent company | - | 5 | - | 2 |
| Subsidiaries | - | - | 886 | 705 |
| Associates | 50 | 51 | 50 | 51 |
| Other related parties | 65 | 28 | 37 | 24 |
| Total | 115 | 84 | 973 | 782 |

Short-term loans from related parties

| As at 31 December | (Million Baht) | | | |
|-------------------|--------------------------------------|------|----------------------------------|-------|
| | Consolidated financial statements | | Separate financial statements | |
| | 2019 | 2018 | 2019 | 2018 |
| Subsidiaries | - | - | 2,467 | 1,506 |
| Total | - | - | 2,467 | 1,506 |

Interest rates during the year 2019 and 2018 were charged at highest money market rate for short-term loan based on BIBOR 3M plus certain fixed margin per annum.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Movements of short-term loans from related parties during the year ended 31 December 2019 and 2018 were as follows:

(Million Baht)

| | Consolidated financial statements | | Separate financial statements | |
|--------------------------------|--------------------------------------|------|----------------------------------|-------|
| | 2019 | 2018 | 2019 | 2018 |
| At 1 January | - | - | 1,506 | 503 |
| Cash flows: | | | | |
| Proceeds from short-term loans | - | - | 961 | 1,003 |
| At 31 December | - | - | 2,467 | 1,506 |

Long-term loans from related parties

(Million Baht)

| | Consolidated financial statements | | Separate financial statements | |
|---------------------|--------------------------------------|------|----------------------------------|--------|
| | 2019 | 2018 | 2019 | 2018 |
| As at 31 December | | | | |
| Subsidiary | - | - | 65,366 | 52,028 |
| Other related party | 3,999 | - | - | - |
| Total | 3,999 | - | 65,366 | 52,028 |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Movements of long-term loans from related parties during the year ended 31 December 2019 and 2018 were as follows:

| | (Million Baht) | | | |
|--|--------------------------------------|------|----------------------------------|--------|
| | Consolidated financial statements | | Separate financial statements | |
| | 2019 | 2018 | 2019 | 2018 |
| At 1 January | - | - | 52,028 | - |
| <u>Cash flows:</u> | | | | |
| Proceeds from long-term loans | 3,999 | - | 17,062 | 51,606 |
| <u>Other non-cash movements:</u> | | | | |
| Amortisation of deferred financing fee | - | - | 10 | 4 |
| Exchange (gain)/losses | - | - | (3,734) | 418 |
| At 31 December | 3,999 | - | 65,366 | 52,028 |

On 11 April 2018, 20 November 2018 and 17 October 2019, the Company entered into long-term loan agreements with a subsidiary totalling of US Dollar 2,163.11 million. The loans bear a fixed interest rate of 3.93% to 5.96% per annum with maturity dates in 2023 to 2049.

On 26 September 2019, a subsidiary entered into a long-term loan agreement with a related company amounting to Baht 4,000 million to purchase additional share capital of an associate. The loan has no collateral and bears a fixed interest rate of 2.82 per annum. The agreement is for a period of 4.5 years from initial drawdown date.

Other non-current liabilities

| | (Million Baht) | | | |
|-------------------|--------------------------------------|------|----------------------------------|------|
| | Consolidated financial statements | | Separate financial statements | |
| | 2019 | 2018 | 2019 | 2018 |
| As at 31 December | | | | |
| Related party | 440 | - | 440 | - |
| Total | 440 | - | 440 | - |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

Significant agreements with related parties

During the year ended 31 December 2019, the Group had the following significant agreements with related parties.

Asset Sale and Purchase Agreement for the Energy Recovery Unit (ERU)

The Company has entered into the Asset Sale and Purchase Agreement for the ERU with a related company to support energy and utilities for Clean Fuel Project (CFP) whereby the purchase price is specified in the agreement. The Company will transfer ownership in the ERU to the purchaser upon satisfaction of all the conditions precedent set out in the agreement (Closing Date). Such conditions precedent include the Company's countersigning of the Provisional Acceptance Certificate (PAC) to the contractor which is expected to occur in 2023 and purchaser and seller receive all necessary certification from relevant authorities.

Fuel and Utilities Supply Agreement

The Company has entered into the Fuel and Utilities Supply Agreement with a related company to supply pitch, other fuels and utilities used in the operation of the ERU. The term of the agreement is 25 years from the Closing Date and the parties may agree to extend the term for another 5 years.

Power Purchase Agreement

The Company has entered into the Power Purchase Agreement with a related company to purchase electricity, steam and other by-products generated by the ERU. The term of the agreement is 25 years from the Closing Date and the parties may agree to extend the term for another 5 years.

Operation and Maintenance Services Agreement

The Company has entered into the Operation and Maintenance Services Agreement with a related company to provide the services of operation and maintenance of the ERU. The term of the agreement is 25 years from the Closing Date and the parties may agree to extend the term for another 5 years.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

40 Business combination

On 12 September 2019, TS purchased the shares for investment in PT. Tirta Surya Raya (TSR), from the existing shareholders of TSR representing 67% shareholding interest. TSR is a company registered in Indonesia and engages in distributing solvent and chemical products. TS purchased 15,410 shares, totalling US Dollar 1.28 million or equivalent to Baht 40.24 million.

The following table summarises the consideration paid for TSR, and the estimated fair value of the assets acquired and liabilities assumed recognised on 12 September 2019, as follows.

| | Million Baht |
|------------------------------|--------------|
| Cash | 40 |
| Total purchase consideration | 40 |

Recognised estimated fair value of identifiable assets acquired and liabilities assumed are as follows:

| | Million Baht |
|--|--------------|
| Cash and cash equivalents | 1 |
| Trade accounts receivable | 15 |
| Other receivables | 31 |
| Inventories | 4 |
| Plant and equipment, net (Note 16) | 3 |
| Other liabilities | (14) |
| Estimated fair value of identifiable net assets | 40 |
| <u>Less</u> Non-controlling interest | (13) |
| Total estimated fair value of identifiable net assets acquired | 27 |
| Goodwill | 13 |
| Purchase consideration | 40 |

The Group is under the process of determining fair value of the acquired net assets which is expected to be finalised within 12 months from the acquisition date.

The revenue and profit for the year in the consolidated statement of income for the year ended 31 December 2019 included revenue and net loss of TSR since 12 September 2019 of Baht 25.58 million and Baht 8.36 million, respectively.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

41 Reclassifications

The comparative figures have been reclassified to conform with changes in presentation in the current year. The Group has reclassified each financial statement line item as follows:

(Million Baht)

| | Consolidated financial statements | | | Separate financial statements | | |
|--|--------------------------------------|------------------|---------------------------|----------------------------------|------------------|---------------------------|
| | Previously reported | Reclassification | After reclassification | Previously reported | Reclassification | After reclassification |
| Statement of financial position | | | | | | |
| as at 31 December 2018 | | | | | | |
| Cash and cash equivalents | 34,041 | (300) | 33,741 | - | - | - |
| Deposits at a financial institution | | | | | | |
| used as collaterals | - | 300 | 300 | - | - | - |
| Short-term loans | 45 | (45) | - | 4,274 | (4,274) | - |
| Short-term loans to related parties | - | - | - | - | 4,274 | 4,274 |
| Short-term loans to a third party | - | 45 | 45 | - | - | - |
| Goodwill | 585 | 205 | 790 | - | - | - |
| Intangible assets, net | 2,460 | (205) | 2,255 | - | - | - |
| Long-term borrowings | 15,054 | (15,054) | - | 52,028 | (52,028) | - |
| Long-term loans from | | | | | | |
| financial institutions, net | - | 14,838 | 14,838 | - | - | - |
| Long-term loans from a third party | - | 216 | 216 | - | - | - |
| Long-term loans from related parties | - | - | - | - | 52,028 | 52,028 |
| Other non-current assets | 4,083 | (3,244) | 839 | 3,837 | (3,169) | 668 |
| Deferred land lease arrangement, net | - | 3,244 | 3,244 | - | 3,169 | 3,169 |
| Statement of income | | | | | | |
| for the year ended | | | | | | |
| 31 December 2018 | | | | | | |
| Revenue from sales and services | 389,343 | (301) | 389,043 | 405,130 | (301) | 404,829 |
| Subsidy from oil fuel fund | - | 3,123 | 3,123 | - | 3,123 | 3,123 |
| Cost of sales of goods and services | (373,128) | (2,822) | (375,950) | (398,208) | (2,822) | (401,030) |

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited

As at 31 December 2019

42 Event after the reporting period

Dividend declaration

At the meeting of the Board of Directors of the Company held on 14 February 2020, the Company's Board of Directors approved the submission for approval at the annual general meeting of the shareholders of the Company the appropriation of 2019 annual dividends at Baht 1.50 per share, totalling Baht 3,060 million. After a deduction of the interim dividends of Baht 1.00 per share which were paid to the Company's shareholders in September 2019, the remaining dividends of Baht 0.50 per share, totalling Baht 1,020 million, are scheduled for payment on 21 April 2020. This dividend is subject to the approval of the Company's shareholders at the annual general meeting to be held on 3 April 2020.

Registered capital increase of subsidiaries

On 2 January 2020, at the Executive Committee Meeting No. 1/2020, the committee passed a resolution to approve a registered capital increase of TOP Ventures Hong Kong Limited amounting to US Dollars 8.3 million. The subsidiary received payment on 7 January 2020 and already registered the change of registered capital.

On 2 January 2020, at the Executive Committee Meeting No. 1/2020, the committee passed a resolution to approve a registered capital increase of TOP Ventures America LLC amounting to US Dollars 8.2 million. The subsidiary received payment on 7 January 2020 and already registered the change of registered capital.

AUDIT FEES OF THE AUDITORS 2019

1. Audit Fee

Thai Oil, subsidiaries and Thairoil Group Registered Provident Fund paid for the audit fees to the auditors' company for the latest account period amounting to Baht 6,519,500 (Six million five hundred and nineteen thousand five hundred baht only).

2. Non-Audit Fee

Thai Oil and subsidiaries paid for non-audit fees for monitoring the performance compliance with the condition of the BOI Promotion Certificate and preparing The Updated Offering Memorandum of the Global Medium Term Notes Program to the auditor's company for the latest account period amounting to Baht 9,137,500 (Nine million one hundred and thirty-seven thousand five hundred baht only).



Professionalism

Ownership and
Commitment

Social
Responsibility

Integrity

Teamwork and
Collaboration

Initiative

Vision Focus

Excellence
Striving



Bangkok Office

555/1 Energy Complex Building A, 11th Floor,
Vibhavadi Rangsit Road, Chatuchak, Chatuchak,
Bangkok 10900, Thailand
Tel : +66(0) -2797-2999, +66(0) -2797-2900, +66(0) -2299-0000
Fax : +66(0) -2797-2970

Sriracha Office and Refinery

42/1 Moo 1, Sukhumvit Road Km. 124, Tungsukla, Sriracha,
Chonburi 20230, Thailand
Tel : +66(0) -3840-8500, +66(0) -3835-9000
Fax : +66(0) -3835-1554, +66(0) -3835-1444

www.thaioilgroup.com

